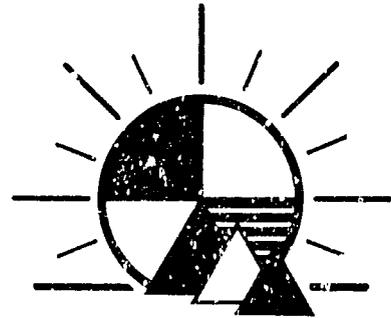


PN-ABA-429 -

ISN 57264



**EGYPTIAN  
RENEWABLE ENERGY  
FIELD TESTING PROJECT**

PNARA 409

**SOLICITATION, OFFER AND AWARD**

1. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 250) RATING PAGE OF 1 1 135 PAGES

2. CONTRACT NO. 3. SOLICITATION NO. 263-50048 4. TYPE OF SOLICITATION  SEALED BID (IFB)  NEGOTIATED (RFP) 5. DATE ISSUED AUG 28 1986 6. REQUISITION/PURCHASE NO.

7. ISSUED BY CODE 8. ADDRESS OFFER TO (If other than Item 7) IF BY COURIER

Office of Contract Services Office of Contract Services  
 USAID, Box 10 USAID/Egypt  
 FPO NY 09527-0008 106 Kasr El Aini Street  
Cairo, Egypt

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".

**SOLICITATION**

9. Sealed offers in original and 4 copies for furnishing the supplies or services in the Schedule will be received at the place specified in Item 8, or if handcarried, in the depository located in (see Block 8 above) until 3:00 local time OCT 27, 1986 (Date)

CAUTION - LATE Submissions, Modifications, and Withdrawals: See Section L, Provision No. 52.214-7 or 52.215-10. All offers are subject to all terms and conditions contained in this solicitation.

10. FOR INFORMATION CALL: A. NAME Orion Yeandel Contracting Officer B. TELEPHONE NO. (Include area code) (NO. COLLECT CALLS) Cairo/Egypt 3548211 Ext. 257/258 377/375

**11. TABLE OF CONTENTS**

W/	SEC.	DESCRIPTION	PAGE(S)	W/	SEC.	DESCRIPTION	PAGE(S)
PART I - THE SCHEDULE				PART II - CONTRACT CLAUSES			
X	A	SOLICITATION/CONTRACT FORM	1	X	I	CONTRACT CLAUSES	104-107
X	B	SUPPLIES OR SERVICES AND PRICES/COSTS	2-3	PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACH.			
X	C	DESCRIPTION/SPECS/WORK STATEMENT	4-90	X	J	LIST OF ATTACHMENTS	108-115
X	D	PACKAGING AND MARKING	91-92	PART IV - REPRESENTATIONS AND INSTRUCTIONS			
X	E	INSPECTION AND ACCEPTANCE	92-	X	K	REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF OFFERORS	116-124
X	F	DELIVERIES OR PERFORMANCE	93-96	X	L	INSTRS., CONDS., AND NOTICES TO OFFERORS	125-132
X	G	CONTRACT ADMINISTRATION DATA	97-98	X	M	EVALUATION FACTORS FOR AWARD	133-135
X	H	SPECIAL CONTRACT REQUIREMENTS	99-101				

OFFER (Must be fully completed by offeror)

NOTE: Item 12 does not apply if the solicitation includes the provisions at 52.214-16, Minimum Bid Acceptance Period.

12. In compliance with the above, the undersigned agrees, if this offer is accepted within \_\_\_\_\_ calendar days (60 calendar days unless a different period is inserted by the offeror) from the date for receipt of offers specified above, to furnish any or all items upon which prices are offered at the prices set opposite each item, delivered at the designated point(s), within the time specified in the schedule.

13. DISCOUNT FOR PROMPT PAYMENT (See Section J, Clause No. 52.233-8) 10 CALENDAR DAYS 20 CALENDAR DAYS 30 CALENDAR DAYS CALENDAR DAYS

	%	%	%
--	---	---	---

14. ACKNOWLEDGMENT OF AMENDMENTS (The offeror acknowledges receipt of amendments to the SOLICITATION for offerors and related documents numbered and dated:

AMENDMENT NO.	DATE	AMENDMENT NO.	DATE

15A. NAME AND ADDRESS OF OFFEROR CODE FACILITY 16. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER (Type or print)

15B. TELEPHONE NO. (Include area code)  15C CHECK IF REMITTANCE ADDRESS IS DIFFERENT FROM ABOVE - ENTER SUCH ADDRESS IN SCHEDULE 17. SIGNATURE 18. OFFER DATE

AWARD (To be completed by Government)

19. ACCEPTED AS TO ITEMS NUMBERED 20. AMOUNT 21. ACCOUNTING AND APPROPRIATION

22. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION:  10 U.S.C. 2304(c)(1)  41 U.S.C. 253(c)(1) 23. SUBMIT INVOICES TO ADDRESS SHOWN IN ITEM (4 copies unless otherwise specified)

24. ADMINISTERED BY (If other than Item 7) CODE 25. PAYMENT WILL BE MADE BY CODE

26. NAME OF CONTRACTING OFFICER (Type or print) 27. UNITED STATES OF AMERICA 28. AWARD DATE

(Signature of Contracting Officer)

IMPORTANT - Award will be made on this Form, or on Standard Form 25, or by other authorized official written notice.

PART 1

SECTION B - SERVICES AND PRICES

B.1 Purpose

The Contractor shall furnish all design, equipment, shipment, installation, and training necessary to have a photovoltaic/diesel powered ice making plant at Wadi El Raiyan, Egypt that meets performance requirements as noted in Section C.

B.2 Price Schedule

<u>A. Item</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Total Price</u>
1. Ice Making & Handling Equipment	_____	_____	_____
2. Ice Storage Building	_____	_____	_____
3. Photovoltaic Array	_____	_____	_____
4. Diesel/Generator Set	_____	_____	_____
5. Battery Storage System	_____	_____	_____
6. Power control & Conditioning System	_____	_____	_____
7. Fishing Shelter Power System (lights, small radio, small refrigerator)	_____	_____	_____
8. Area Lighting (a single street light type) for boat handling	_____	_____	_____
9. Water Supply Equipment	_____	_____	_____
10. Water Treatment System (if required)	_____	_____	_____
11. Required Operating, Maintenance, Repair Tools, Meters, etc.	_____	_____	_____

	<u>Quantity</u>	<u>Unit Price</u>	<u>Total Price</u>
12. Equipment for making ice blocks from daily production of plate or flake ice	_____	_____	_____
13. An on-site data Acquisition System for performance monitoring.	_____	_____	_____
14. Required Spare parts.	_____	_____	_____
15. Support Structure	_____	_____	_____
16. Ice Crusher	_____	_____	_____
<b>B. <u>Activities</u></b>			
Freight			_____
Insurance*			_____
Installation & Check Out			_____
Training			_____
DBA Insurance Required per Section H. 1			_____
<b>TOTAL CONTRACT PRICE</b>			<b>\$ _____</b>
Operation & Maintenance Assistance**			_____

\*To project site in Egypt with insurance remaining effective at least 6 months after arrival at the port of Alexandria.

\*\*According to item 4 in the Statement of Work, the Contractors are required to submit a complete program for Operation & Maintenance Assistance which will not be part of the evaluation but be negotiated as part of the entire agreement.

SECTION C  
STATEMENT OF WORK

Design, Installation and Operating/Maintenance Training  
For a Photovoltaic/Diesel Powered Ice Making Plant

1. PROJECT DESCRIPTION

1.1 Background of the Renewable Energy Resources Field Testing Project

The Government of Egypt herein referred to as (GOE) and the U.S. Agency for International Development (USAID) have initiated a four year renewable energy resource field demonstration project (REFT). The Egyptian Electricity Authority (EEA) and Louis Berger International, Inc. are leading a team of subcontractors in the REFT project activities that encompass solar industrial process heat, wind and photovoltaic system applications.

The specific objectives of the GOE/USAID project are twofold: (1) to demonstrate, analyze and evaluate the viability of commercially available renewable energy technologies in Egypt, (2) to establish the infrastructure necessary to ensure that successful renewable technologies are available for widespread use in-country. Three tasks are planned:

- (1) Field Tests - Assessment of some selected renewable energy systems/ applications which could be suitable for commercial use in Egypt; develop detailed engineering design hardware specifications and system performance requirements; prepare RFP packages for procuring equipment; supervise the work of hardware contractors; and collect and evaluate data generated from the field tests.
- (2) Supporting Analysis - Conduct technical, social, financial, economic, and market analysis of renewable energy systems related to the field tests. Develop a computerized Renewable Energy Information System (REIS).
- (3) Training - Improve the skills of the EEA and the private sector in evaluating renewable energy technologies, applications, economics and markets, and provide technical assistance in systems design, installation, operation and maintenance.

The field test task consists of eleven separate renewable energy system application demonstrations; five solar industrial process heat applications, three photovoltaic field test applications and three wind system applications. One photovoltaic field test is a demonstration of a PV/Diesel hybrid power system

powering an ice making plant primarily to produce ice suitable for fish preservation. The system will be located at Wadi El Raiyan, a man-made lake managed by the Fish Resources and Development Authority (FRDA). The lake is near El Faiyum, about 140 kilometers southwest of Cairo.

## 1.2 Summary of Bidder Requirements

The tenderer shall submit a complete proposal for a turn-key job for the design, manufacture, supply, instrumentation, installation, testing and performance guarantee of a photovoltaic-diesel integrated power system and ice making plant. The complete system shall be capable of providing 5-6 tons/day (2000 pounds per ton; 24 hour day) of ice suitable for fish preservation for transport to commercial markets. There is also a requirement to supply power for small auxiliary loads such as water pumping and lighting. The proposals shall include on-the-job, classroom and in-factory training programs, including training materials and manuals, according to requirements specified in Section 6.0, for assigned Egyptian engineers and technicians in the operation, maintenance, troubleshooting and repair of both the system and its various related individual components. The contractor shall support operation of the system for a period of two years after the system is accepted by the EEA/FRDA/USAID. Each tenderer shall submit a set of qualification documents describing in detail the contractor's and subcontractor's relevant capabilities and experience on similar projects. EEA/USAID reserve for themselves the right to refer to any of the tenderer(s) customers to get more information about the contractor and/or the performance of equipment to be supplied.

The offer shall be made on a turn-key-basis. The contractor shall define in detail all site preparation procedures. It is anticipated that needed civil works would be performed locally by the EEA/FRDA according to the tenderer's specifications and drawings and under the supervision of his representatives.

Representative climatic conditions are shown in Appendix A. The presence of airborne sand in the atmosphere, occasional sand storms and high relative humidity accompanied with high temperature in summer shall be taken into consideration in the design of the offered equipment.

For each component offered, the tenderers shall state in his offer the exact type and model number. He shall also submit a complete set of catalogues and drawings for each hardware item offered indicating its detailed technical specifications. All hardware offered shall be commercially available and proven by reliable use in similar applications. The tenderer is required to supply information regarding his system in a format as indicated in Appendix D to facilitate evaluation of the proposals. The information listed is not exhaustive; if additional information is available which appears to be useful to the evaluators it should be included.

The tenderer shall include in his offer a preliminary design; system layout drawing; functional schematic; system electrical circuit diagram including the performance monitoring instrumentation system; typical daily power and load operating curves for the diesel, PV, battery, and ice maker; and maintenance requirements for each major equipment item. In addition, the proposal should include details of the installation design.

Packaging and shipping of all required hardware to Alexandria/Egypt and from there to the site shall be the responsibility of the contractor. Custom clearance and permits are the responsibility of the EEA.

The bidder shall furnish at a minimum the following equipment, materials and services:

Hardware

1. Ice Making and Handling Equipment
2. Ice Storage Building
3. Photovoltaic Array and Support Structure

4. Diesel/Generator Set
5. Battery Storage System
6. Power Control and Conditioning System
7. Fishing Shelter Power System (lights, small radio)
8. Area lighting (street light type) for boat handling
9. Water Supply Equipment
10. Water Treatment System (if required)
11. Appropriate User's Manuals
12. Required Operating, Maintenance, Repair Tools, Meters, etc.
13. Equipment for making ice blocks from daily production of plate or flake ice
14. An on-site data acquisition system for performance monitoring
15. Required spare parts for 5 years
16. Ice crusher

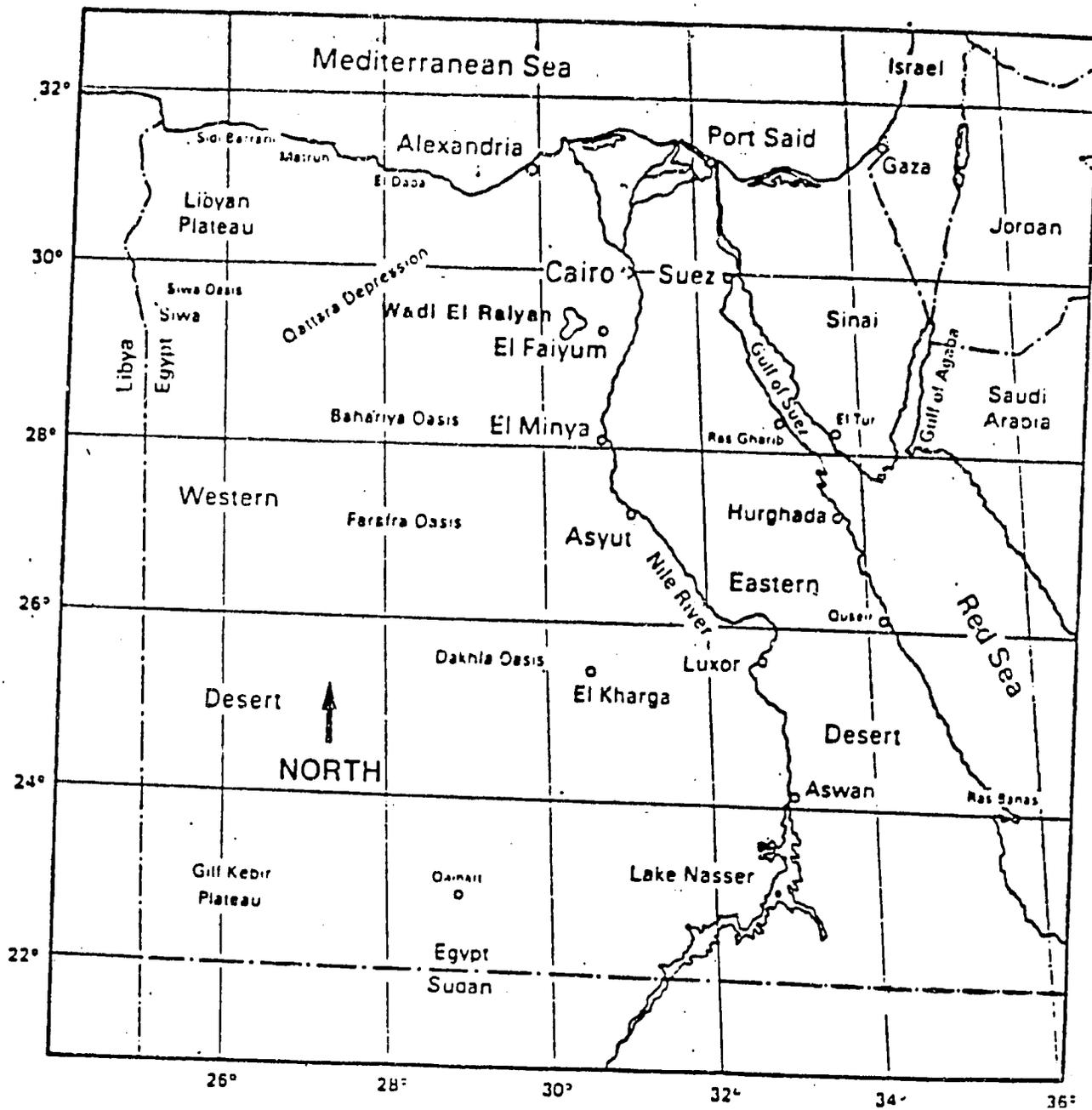
#### Services

1. System Design, Instrumentation, Procurement and Shipment
2. Installation and Operations Support for 2 years
3. Acceptance Testing (30 days)
4. Training of Egyptian Engineers/Technicians (Classroom, in-factory and on-the-job in Operation, Maintenance, Troubleshooting and Repair)

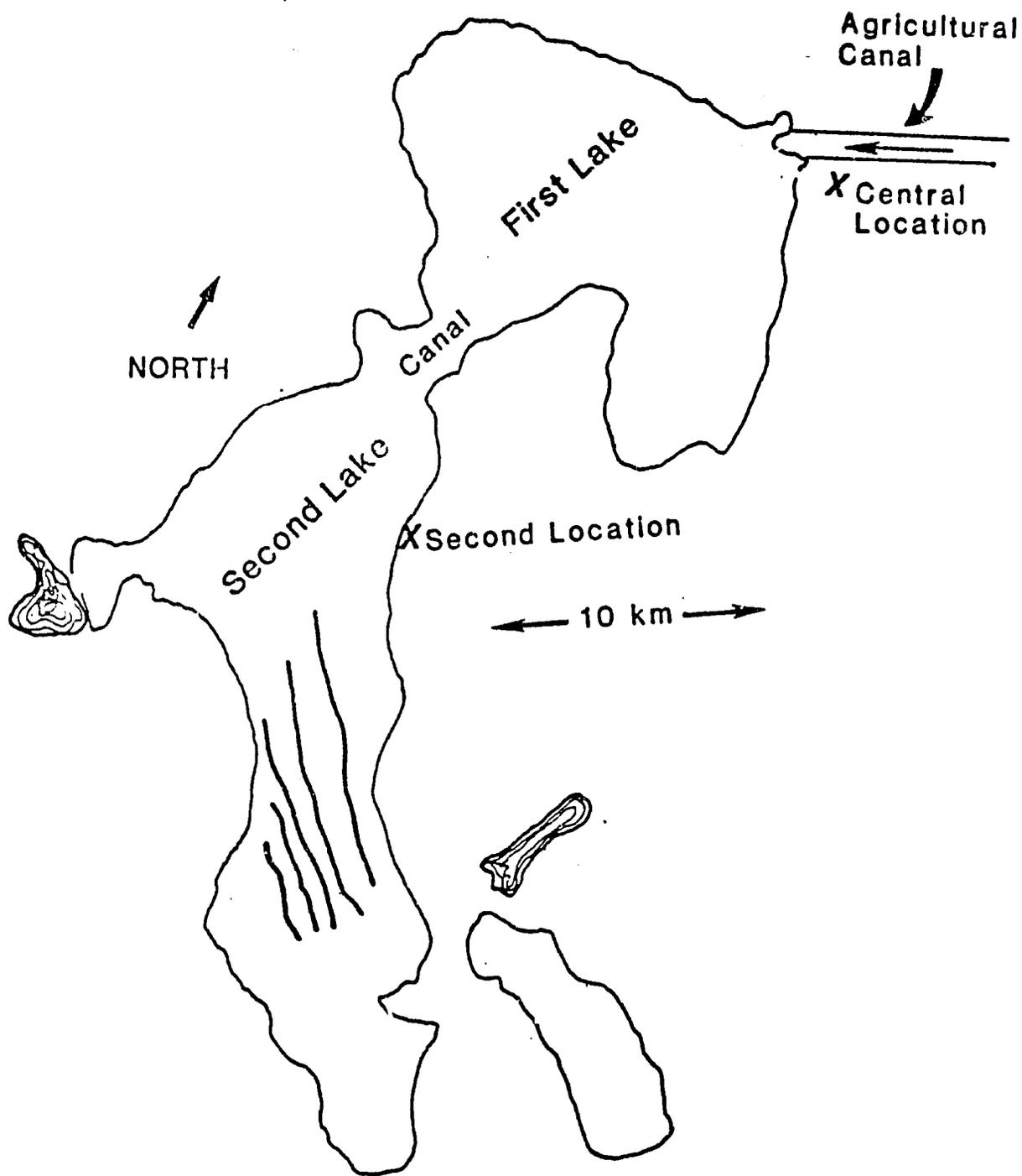
#### 1.3. Description of the Application Site

Wadi El Raiyan is a large depression containing two man-made lakes near El Faiyum, Egypt about 140 km southwest of Cairo (Exhibit 1). The Lakes are being formed by the discharge of an agricultural drainage canal. The lake area is being scientifically managed by the Fish Resources and Development Authority (FRDA) as a source of over 1400 metric tonnes per year of fresh fish for El Faiyum, Cairo, and other neighboring areas.

Exhibit 2 shows that the lake area consists of two distinct lakes joined by a short canal. The "Central Location" on the first lake near the outlet of the agricultural drainage canal is the collection point of all fish from the two lakes throughout the season. The location of the PV/Diesel Ice Making Plant will be at the Central Location as shown in Exhibit 3. The Central Location is approximately 10 kilometers from the nearest village. The road between the site and the village is unpaved and often indistinguishable from the surrounding desert. There are no suitable facilities of any type located at the site for accommodation or equipment security.



**Exhibit 1 WADI EL RAIYAN LAKE LOCATION**



**Exhibit 2. WADI EL RAIYAN LAKE AREA**

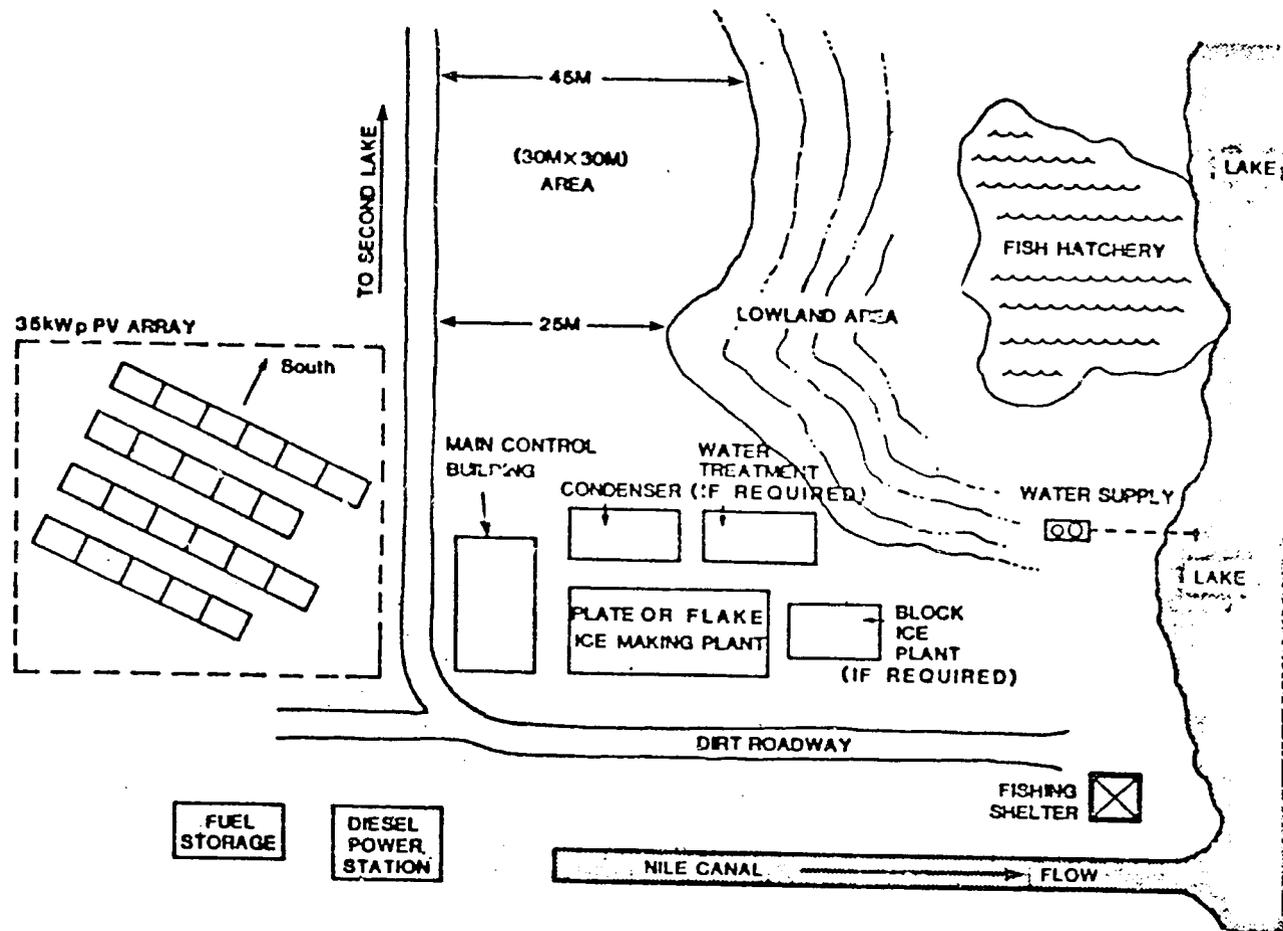


Exhibit 5-3 SITE EQUIPMENT LAYOUT

The existing practice for transporting fish from the lake area is to bring ice from El Faiyum and other locations, pack fish at a Central Location, and return to the market. The fishing season is regulated by the FRDA and may run from September through May over different areas of the lake. Fishing is not permitted during the summer months namely June, July and August because of the spawning season. Fishing was conducted regularly for the first time in December 1984 - April 1985. However, the 1985 fishing season started earlier (on October 2) and was expected to run until May of 1986. Fishing starts daily during the season at approximately 5 PM and ends at about 7 AM the next day. Fishing occurs 7 days per week. For this reason the PV/Diesel Ice Making Plant must provide a full capacity of ice at 7 AM daily to permit icing of the fish for transport to market.

The production of fish at the lake has varied throughout the fishing season from 40 metric tonnes per day decreasing gradually to .2 tonnes per day at the end of the season. The Fishing Authority expects the fish harvest to be not less than 10 tonnes per day. The ice to fish ratio ranges from 1:1 to 2:1. The average daily fish catch ranges from 10 to 15 tonnes. The ice making system will supply only a part of this demand, i.e. 5-6 tons per day. The system shall be instrumented to monitor its performance and to provide data to assess the technical, economic and social impact of such a hybrid power system.

#### 1.4 Summary of Solar, Water, and Ambient Temperature Data

Meteorological and water quality data are provided in Appendix A and Appendix B respectively. The design of the system should be based on these data. The solar insolation data for the site is based on recorded data (sunlight hours) from a meteorological station in El Faiyum. Horizontal daily global insolation ranges from 3.4 kWh/m<sup>2</sup>-day in December to 8.1 kWh/m<sup>2</sup>-day in June. The ambient temperature data for the site is based on meteorological station data from El Giza, a city near Cairo. An additional 2 degrees Centigrade has

been added to each temperature value to reflect the generally higher temperatures at the site compared with El Giza. The lake water temperature ranges from 8 to 26 degrees Centigrade in the vicinity of the Central Location.

Exhibit 3 is a site sketch showing one possible location of the ice maker in relation to the lake and the agricultural drainage canal. The agricultural drainage canal dries up for about one month around January. This fact combined with the high sediment content of the agricultural canal water precludes it from being used as a source for either ice making water or condensor cooling water. Therefore, water must be pumped from the surface of the lake. A water quality analysis of the lake water in the location of the ice plant is provided in Appendix B. Ice will be used for commercial applications, not for human consumption. However, it is anticipated that water pretreatment will be required to ensure low maintenance of equipment. Equipment should be designed to minimize corrosion.

## 2.0 PV/DIESEL HYBRID POWER SYSTEM AND ICE MAKING PLANT DESIGN SPECIFICATIONS

### 2.1 Schedule for Design, Delivery and Installation

The Contractor's proposal shall include the dedicated time requirements for the design, manufacture, factory testing, procurement, and delivery of the complete system CIF to Alexandria, Egypt. In no case shall the total time exceed 180 days from the date of final design review and approval (Section 2.2). The duration for installation of the system shall also be indicated and in no case shall it exceed 120 days from the date the equipment arrives on the site.

Within 14 days after contract award and a site visit, the Contractor shall submit for EEA/USAID review a detailed project schedule for the design, manufacture, factory testing, installation, instrumentation, startup and acceptance testing of the proposed PV/Diesel Ice Making Plant. The schedule shall include provision for a final design review and approval by EEA/USAID, or its designated

representative, prior to start of manufacture and procurement. The schedule will be approved in writing by the **Project Officer** within 21 days of receipt in Cairo.

## 2.2 Design Review

The EEA/USAID or its authorized representative shall have the right to review drawings and specifications pertaining to the design of the system and individual components. Submission of the drawings and specifications for review and the completion of the review will be in accordance with the detailed project schedule (Section 2.1) submitted by the Contractor and approved by EEA/USAID. The EEA/USAID shall have the right to require modifications to the design prior to final design approval for specified cause, namely: for minimum safety, prevention of harm to the property or equipment, or negative impact on the fishing or agricultural activity in the Wadi El Raiyan lake area.

## 2.3 General Design Requirements

The PV/Diesel Ice Making Plant design shall conform to U.S. standard specification and practice with all equipment sited and sized for efficient, safe and functional use. The system should be designed for a life of a minimum of 20 years except for the battery system which may be designed for a 10 year life based on one charge/discharge-cycle per day. The power control system, including switches and circuit breakers, should provide for reasonable equipment protection against incorrect procedures for starting, stopping and operating the equipment. It should be simple in operation and maintenance. A warranty shall be offered, above a standard warrant if required, to guarantee the proper function of all components of the system for a period of 5 years from the date of the approved acceptance test. Operating and maintenance personnel safety shall be an integral part of the system design. All proposed equipment shall be commercially available, to the maximum extent possible, and of demonstrated

reliability; the use of prototype or one-of-a-kind hardware is discouraged.

The required level of design detail shall include as a minimum:

- o Justification for system sizing and design including all calculations and technical/operational assumptions
- o Justification for component selection
- o Component (product) literature where appropriate
- o General electrical schematics showing junction connections, grounding circuitry, voltage and current limits, etc.
- o An installation diagram that includes the relative sizing and location of major pieces of equipment in relation to the lake at Wadi El-Raiyan

## 2.4 Technical Design Requirements

### 2.4.1 System Sizing

The PV/Diesel Ice Making Plant shall be designed to provide 5-6 tons/day (10,000 to 12,000 pounds in (24 hours) of ice at 25 degrees Fahrenheit (-4°C) available daily at 7 AM. An ice storage building shall be designed to maintain a minimum of 10 tons (20,000 pounds) of ice for a period of at least 2 days.

The provision of water for making ice and for condensor cooling, in the case that a water cooled condensor is proposed, shall be the responsibility of the Contractor. The proposal shall include the provision of any water treatment equipment which may be necessary to produce a quality of ice suitable for fish preservation and to minimize the level of maintenance of the ice making equipment. The proposal should clearly describe any water treatment requirements including needed chemical treatment and disposal of any residues.

The power system shall be designed for the following characteristics:

- o Either DC or 50 Hertz AC power is acceptable.
- o The diesel/generator shall be able to operate the ice plant, independent of the PV/battery power system.
- o Battery Storage shall be the minimum necessary to accept the full array charging current rate and operate the load independent of the PV array or diesel.

- o The PV array for ice making (excluding block ice production) shall be sized to meet 40 percent of the average daily energy demand over the year for a 5-6 ton/day capacity unit.
- o The production and use of PV power shall be maximized.
- o The power control system shall be automatic with manual override.

The PV array structure shall be of a manually adjustable tilt design.

For example, the array shall be capable of being adjusted in October/November and March/ April time period at an angle that maximizes energy production for each respective time period. The design and sizing of the power system shall be performed considering the system to be operated in an optimum fixed position so as to maximize energy production from the array from October through March.

The diesel should be capable of manual self-starting, independent of the PV array and control system.

#### 2.4.2 Control System Design

The control system design should be kept as simple as possible and should conform to standard industry practice for wiring, environmental protection of solid state electronics, and safety. The control system shall incorporate manual and emergency disconnects for the load and power equipment. NEMA 4 enclosures will be used throughout the system. EEA/USAID, or its designated representatives, has the option to request and to witness the full load testing of the control system at the manufacturer's facility prior to shipment.

#### 2.4.3 PV Array

The PV array shall be made of commercially available flat plate modules of single, poly(multi), or ribbon crystalline technology. Grounding of the array and structure shall conform to U.S. standard industry practices, or the equivalent.

#### 2.4.4 Diesel/Generator Set

The diesel/generator shall produce 50 Hertz AC power if AC loads are used. If DC loads are used either an AC or DC generator is permissible. The unit shall be skid mounted and it shall contain standard operating gauges and controls separate from those supplied with the system controls. The diesel generator shall be designed for heavy duty full load operation under environmental conditions specified in Appendix A.

#### 2.4.5 Battery

Lead acid deep cycle batteries, sealed or vented are desired. Vented batteries should be supplied with recombination caps and an easy method of determining electrolyte level. The proposal shall describe battery operation including required equalization periods and duration and any special procedure for operation in a high temperature environment.

#### 2.4.6 Ice Making Plant

The ice making plant shall include the compressor, ice making unit and all necessary components to provide the required ice production. The tenderer is expected to justify and include in his proposal the related equipment and its installation necessary to supply condensing water and/or air in the required amounts and pressures to meet the ice making plant capacity requirements. Provisions for the operation of the proposed equipment to make block ice from plate or flake ice should be provided. Maintenance requirements for each equipment component and the entire system should be clearly explained.

#### 2.4.7 Ice Storage Building

A prefabricated ice storage building shall be supplied by the tenderer and be of a size and construction to permit the storage and maintenance of a minimum of 10 tons of ice for a period of up to 2 days in the environment specified in Appendix A. A minimum of ice handling is preferred in order to reduce the

number of moving parts and reduce energy load. Ice should remain loose and accessible during normal operating schedules.

#### 2.4.8 Additional Equipment

- o Inverter (if proposed)

If inverter(s) are to be supplied they must conform to U.S. industry standard or equivalent and have a demonstrated field performance history. Operating procedures should be simple and clear. EEA/USAID or their representatives reserves the option to request and to witness full load testing of the inverter prior to shipment. Documentation of past experience with proposed inverters is required.

- o Battery Charger/Rectifier

A commercially available battery charger/rectifier is required so that the battery bank can be charged by the diesel.

- o Building and Tools

The proposal shall include a building with adequate ventilation to house the batteries, control electronics, and possibly the diesel/generator. An adjoining room should be provided for plant operators. Construction of the building is the responsibility of the Contractor. A set of tools and instruments necessary to troubleshoot usual problems and make repairs utilizing the spare parts supplied shall be provided.

- o Area Lighting

Two single street-light-type lighting systems are required at the staging area for fishing boats. The light shall be automatically controlled.

- o Fishing Shelter Power System

An independant PV power system is required for a small fishing shelter. It consists of a small PV array, battery, single controls with high and low voltage battery protection and the loads as described below. It should provide for minimal lighting and communication power. Two 20 watt and two 7 watt DC lamps are anticipated each operated 12 hours per day.

- o Water Pre-treatment

The proposal shall include a discussion of the effect of the water quality at Wadi El Raiyan, as described in Appendix B, on the production of ice suitable for the commercial application of fish transport. Equipment that the Contractor believes is required for water pre-treatment shall be included as part of the contractor's proposal and appear as a separate item in the cost proposal.

o On-Site Data Acquisition System (ODAS)

An ODAS shall be designed, purchased and installed by the contractor as specified in Section 5 of this statement-of-work.

o Block Ice Making Equipment

The proposal shall include equipment required to make block ice from either plat or flake ice at a capacity equivalent to the plate or flake ice making plant. The block ice making equipment should be capable of being operated by the PV/diesel hybrid power system although not necessarily concurrently. Block ice normal size of either 10-15 lbs or 55 lbs is desired.

## 2.5 Proof of Performance

The EEA/USAID and/or its appointed representatives reserves the right to witness inspection and performance tests for all hardware equipment at the manufacturer's (or contractor's) facilities prior to shipment. The Contractor shall provide 30 days notice of performance testing for components. As mentioned under Section 2.4.2 and 2.4.8 the power control system and inverter, if supplied, shall be required to undergo full load testing (burn-in) prior to shipment. The proposal should address this issue by explaining what tests will be performed to assure field and reliable operational performance of components prior to shipment. This testing is the responsibility of the contractor. It shall be witnessed by EEA/USAID or appointed representatives.

## 3.0 PV/DIESEL ICE PLANT INSTALLATION

### 3.1 Equipment Shipment

Packing, insurance, freight and related charges to deliver all equipment items to Alexandria, Egypt and then to the site is the responsibility of the contractor. EEA, FRDA and/or its appointed agent will be responsible for for custom clearance and permits for the field test construction.

The supplier shall send shipping documents, bill of lading, inspection certificates and other related documents to EEA one month prior to the receipt of the equipment at Alexandria.

All equipment shall be packaged or boxed in clearly numbered cartons or boxes. A Box Contents List (BCL) shall be delivered to the USAID contracting officer with a copy to EEA prior to the delivery of any equipment at Alexandria. This is in addition to Bill of Lading documents. The BCL shall identify the numbered contents of each box by the number of the box. Box number shall be grouped by subsystem. For example, PV arrays and related hardware are number series 200, batteries 300, and so forth. Prior to shipment, the tenderer should define in writing such equipment transport and receipt controls in similar detail as that provided above.

### 3.2 Plan and Schedule for Construction

The schedule for design, delivery and installation submitted in accordance with Section 2.1 shall include the number and skill level of laborers which will be employed; the duration of the work; and the plans for accommodations for both the labor force and the Contractor's personnel. There are no suitable facilities of any type located at the site for accommodation or equipment security.

The Contractor is required to furnish all installation tools such as shovels, concrete forms, and mechanic's and electrician's tools necessary for the installation, startup and regular operation of the equipment. This equipment shall remain at the job site as part of the deliverable hardware under this contract.

Within two weeks of EEA/USAID approval of the design of the PV/Diesel ice-making plant the Contractor shall submit a "Plan and Schedule for Construction" to the USAID Project Officer for approval. The Project Officer will approve the Plan/Schedule, or recommend changes required for approval within two weeks of receipt in Cairo. All construction work shall be completed within 120 days of notification to the contractor by EEA/USAID or its appointed agent that the system hardware is at Wadi El Raiyan.

The EEA/USAID reserves the right to periodically inspect all phases of the work while in progress or after completion of the whole or any part thereof to insure that the work is performed in compliance with the terms of the contract. If EEA/USAID determines that the work is not performed in accordance with the specifications, they reserve the right to require that the work be corrected of deficiencies or be redone if corrections cannot be made acceptable or are too expensive to economically correct. Any part of the work that is redone shall be at the Contractor's expense. All work related records shall be available at all times for examination by the EEA/USAID Contracting Officer. The Contractor shall provide all necessary facilities for such inspection during contractor's regular working hours, if necessary. It should be clearly understood, except as otherwise provided, that such progress inspection shall not constitute acceptance by the Contracting Officer of any part of the work, but will be for the purpose of coordination and assistance in interpretation of specifications and technical requirements.

### 3.3 Site Planning and Construction

The contractor is responsible for the proposed design of the foundations, earthwork, drainage and method to prevent or or minimize erosion. The contractor shall specify requirements for array structure foundations and cost these as a separate item in the cost proposal. In lieu of soil boring data, foundation specifications and cost shall include the minimum and maximum expected based on a range of soil conditions.

Within one month of system acceptance (see Section 7), the Contractor shall enter all changes and corrections to the original system design incurred in the system installation on the original tracings. Changes and corrections so entered shall be indicated by a lettered circle, and noted as "As-Built" in the revision. In the case where no revisions or corrections to an individual

drawing were necessary, the notation "As-Built-No-Changes" shall be made directly below the revision block. Where several manufacturers' brands, types or classes of items listed have been used in the project, the specific areas where each item was used shall be designated. Designations shall be keyed to the area and space designations on the contract drawings. Information shall be furnished, typewritten, for the listed materials. Copies of the "As-Built" drawings shall be given to the Contracting Officer.

The Contractor is encouraged to use local Egyptian labor and in-country fabrication of subsystems whenever possible. Low-cost fabrication techniques should be emphasized. The proposal shall discuss the extent to which the proposed system can be constructed and installed by local labor using local materials should the system be replicated elsewhere in Egypt. The contractor shall indicate where this approach has been taken with this or similar equipment in other developing countries. The contractor should specify needed facilities for housing local labor installation personnel.

#### 4.0 OPERATION AND MAINTENANCE

##### 4.1 Schedule of Energy Production

The Contractor shall include in the proposal an "Energy Production Plan and Schedule." This document shall contain, but is not necessarily limited to, average daily energy supply and demand projections for twelve months of electrical power generation and ice tonnage from the PV/diesel system based on the insolation in Appendix A. A complete description of how these projections were computed, including descriptions of any computer models used, is required. Input parameters to any model shall be given. Planned scheduled outages during the upcoming year and planned changes in equipment, control mode, or operating characteristics significantly impacting the energy production of the system will be given, if applicable.

#### 4.2 Guarantee/Spare Parts Requirements

The contractor shall provide at least a 5 year guarantee on all parts from the time of EEA/USAID system acceptance. The contractor shall separately cost an itemized list of spare parts that should be purchased by EEA/USAID and made available to insure trouble-free operation for five years. Any specialized, custom manufactured tools or equipment required for operation and maintenance of the system shall be specified and provided by the contractor.

#### 4.3 Operations Support

The contractor is required to provide technical support of the operation of the system for a period of 2-years after system acceptance by EEA/USAID. The contractor's proposal shall describe the level of support offered, the procedures for management and control of the technical support and related support issues such as availability of spare parts, anticipated response time to a request for support, etc. This technical support shall be costed as a separate cost item in the contractor's cost proposal.

#### 5.0 PERFORMANCE MONITORING

##### 5.1 Field Test Data Acquisition System

The contractor will provide an on-site data acquisition system (ODAS) for monitoring the performance of hardware installed for this field test. This requirement is in addition to any other requirement for system control instrumentation and instrumentation necessary for routine test and maintenance checks as specified in Sections 2.4.2 and 4.2 of this statement-of-work.

The ODAS will comply with the specifications listed in Appendix C of this statement-of-work and will monitor, as a minimum, the data parameters listed in Appendix C. The contractor will provide output ports and transducers to sample and measure each data parameter as specified in Appendix C and to insure compatibility with the data storage system proposed. The contractor will

also provide a separate meteorological station to monitor data parameters as specified in Appendix C. The meteorological station will have its own data recording system that is compatible with the ODAS. If an exception must be taken to any of these requirements, the contractor will clearly note the exception and explain why the exception should be acceptable to the EEA/USAID.

## 5.2 ODAS Installation and Training

The contractor will install the ODAS at the same time that the field test hardware is being installed. Training for Egyptian engineers and technicians in the installation and operation of the ODAS will be included in the on-the-job training program described in Section 6 of this statement-of-work.

The ODAS instrumentation and installation shall be a separate item in the cost proposal for this field test. The EEA/USAID reserves the right to replace or modify the proposed ODAS during contract negotiation if required to maximize compatibility with other data collection, analysis and storage requirements of the REFT Project.

## 5.3 Log Sheets/Maintenance Record

The contractor shall develop, as part of the proposal, a log sheet of pertinent data that should be manually recorded on each major subsystem to document operations and maintenance history. The recommended frequency for maintenance of each item shall be stated. These logs/records should comply with the specifications outlined in Section 8.

## 6.0 TRAINING REQUIREMENTS

The following training program and materials are required from the contractor for this project. These training programs fall into three general areas: classroom training in Cairo, in-factory training in the U.S. and on-the-job training at Wadi El-Raiyan, Egypt. Training sessions and materials vary

in content and presentation from informal "one-on-one" type instruction to more formal group "lectures and workshops." The sections below describe the training requirements. All training and materials will be written and conducted in English. All emergency start-up and shut-down procedures must be provided in both English and Arabic.

#### 6.1 Operator Training Program

Formal Classroom training will be given in Cairo for EEA and FRDA engineering, operating, and maintenance staff in the design of the PV/Diesel Powered Ice Making Plant. This training is anticipated to be for 20 hours (5 days, 4 hours per day) and intended to provide the EEA and FRDA staff with an understanding of the engineering parameters, design process, and decisions which resulted in the final design of the system. This training will be conducted at the start of the installation work and is not intended to require a separate dedicated travel to Cairo.

As part of this proposal, the Contractor shall develop a syllabus that briefly summarizes topics and content of the classroom design training program.

#### 6.2 Maintenance Training Program

Formal classroom training will be given in Cairo for selected EEA and FRDA engineering, operating and maintenance staff in the operation, maintenance and repair of the system and individual components. The training is anticipated to be for 20 hours (5 days, 4 hours per day). The training will utilize the actual working drawings for this project to cover such topics as installation procedures, specifications, construction schedule and labor requirements. This training is intended to familiarize EEA and FRDA staff with the details of the installation as well as the project management aspects of the project. System installation will begin as soon as possible following this training and the operator training program (Section 6.1).

The Contractor is required to operate the PV/diesel ice maker for a period of 30 days after the system is designated as operational by the EEA/USAID. During this time period the contractor shall provide an on-the-job training program in the operation, maintenance and repair of the system and equipment components for up to 10 EEA or FRDA engineers and technicians. The training program shall consist of a minimum of 20 hours of on-site formal classroom training and 80 hours of on-the-job (OJT) field training. As part of the proposal the contractor shall develop a syllabus for the on-site training program that briefly summarizes the topics, operating and maintenance procedures which will be taught.

It is assumed that the OJT field training will consist of selected EEA and FRDA personnel accompanying the contractor personnel during normal daily operational tasks. The contractor shall briefly describe, as part of this proposal, the itinerary of the PV/diesel ice plant operating personnel over an average day. The itinerary should take into account the demonstration nature of this field test, i.e., the Egyptian engineer must understand the function and operation of any specialized equipment and instrumentation.

### 6.3 In-Factory Training Program

The Contractor is required to provide and/or coordinate in-factory training on the operation, maintenance and repair of the PV/diesel ice making plant system and major equipment components. This training is anticipated to take place at the respective manufacturer's facilities for the following components; PV array, batteries, diesel engine, ice making plant, inverter and system controller. The training should be both classroom and "hands-on". The total number of training days is not expected to exceed 20 days covering all subsystems. All expenses for the visiting engineers are the responsibility of

EEA/USAID. As part of this proposal the Contractor shall develop a syllabus for the in-factory training and suggested itinerary for the program.

#### 6.4 Training Manuals

For each training item the contractor shall provide a training manual for each of the participants.

#### 7.0 SYSTEM ACCEPTANCE TEST CRITERIA

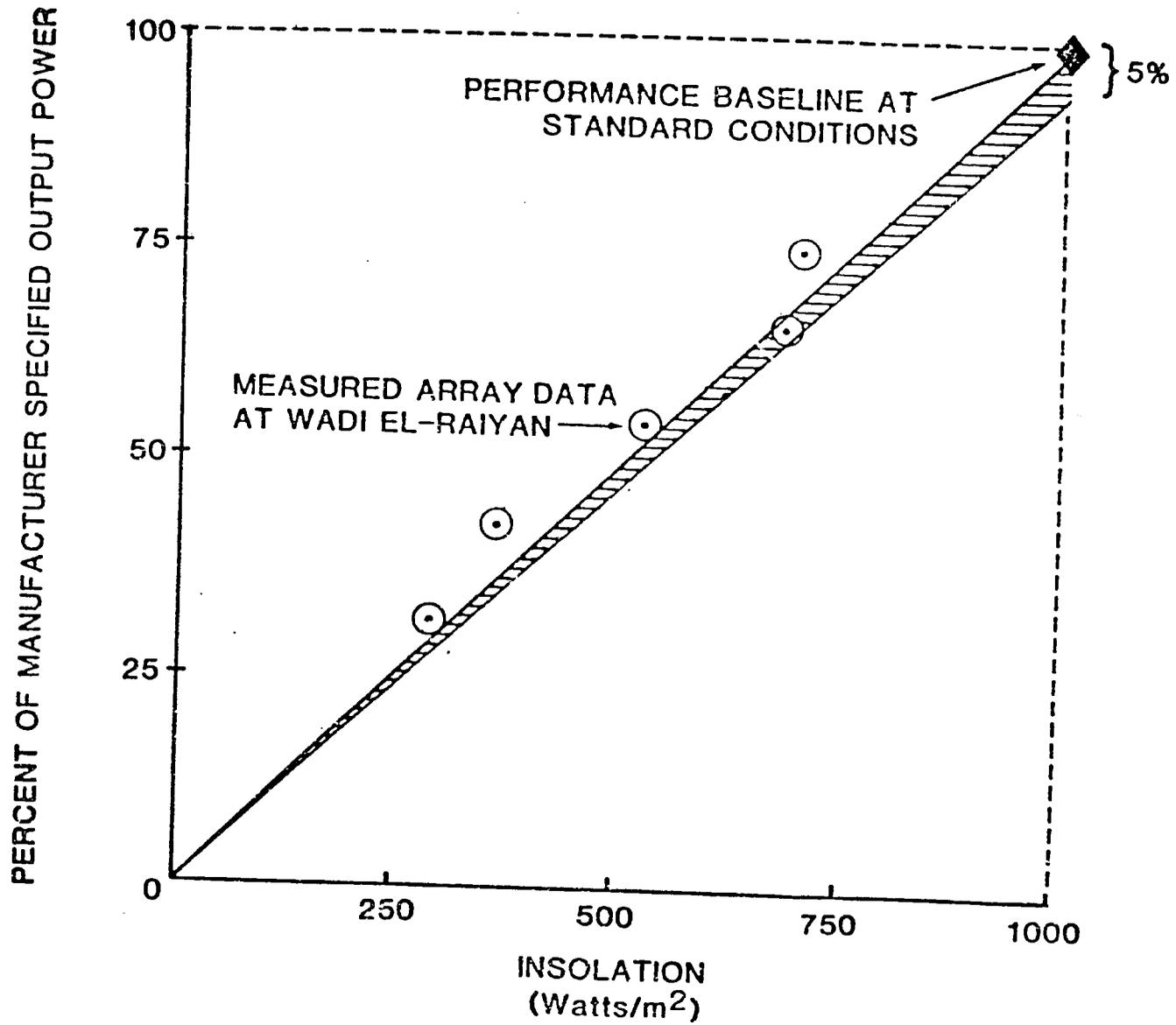
The Contractor shall include in his proposal a proposed Acceptance Test procedures for "Point of Manufacture Testing" and "Field Acceptance Test" of the system and specific components. At a minimum it shall include the following:

##### 7.1 Point of Manufacture Testing (PMT)

The Contractor shall detail in his proposal the procedures to be followed for the point of manufacture testing of the major equipment items. At a minimum this shall include: diesel, PV modules, PV controller, power system controller, pumps, inverter (where proposed), batteries, and ice making plant. EEA, FRDA and USAID or their authorized representative shall have the right to attend and witness component and system performance testing at the manufacturers prior to shipment. EEA, FRDA and USAID representatives attending the tests shall have the right to require measures and procedures necessary to ensure that tests comply with contractors proposed testing procedure specifications (JPL, IEEE, ASME, etc.). PMT data and acceptance test certificates shall be assembled into usable formats to constitute baseline acceptance test data for the equipment. The signed (manufacturer) and countersigned (EEA and USAID and/or representative) acceptance test certificates shall be considered part and parcel of the necessary shipping documents.

##### 7.2 Field Acceptance Testing

The Contractor proposal shall provide, in detail, performance guarantees



**Exhibit 4.**  
**PV ARRAY PERFORMANCE VERIFICATION**

and evaluation procedures for the system and its major components. These shall include at a minimum the following:

- o Diesel operating efficiency as a function of load over a sustained running time.
- o Battery "round-trip" efficiency as a function of temperature and state of charge.
- o Control system full operational performance.
- o System performance (ice production) by both diesel and PV/battery power systems.
- o A PV array performance guarantee

EEA and USAID and/or their authorized representatives shall participate in a 30-day acceptance test conducted by the contractor at the site. The contractor shall submit in the proposal the guaranteed PV array output power at standard operating conditions (1000 watts/m<sup>2</sup>, 25°C). The EEA/USAID, or its designated representative, will measure array current-voltage (I-V) curves at a number of daily insolation and ambient temperature levels throughout the 30-day acceptance test period. Calibrated pyranometers, curve tracers, and temperature measurement instrumentation will be used. For each I-V curve, the maximum power point will be corrected (normalized) for temperature and plotted as shown in Exhibit 4. All measured data must be above 95 percent of a straight line drawn from the origin to the guaranteed manufacturer output power value (Exhibit 4).

#### 8.0 PV/DIESEL/ICE PLANT OPERATIONS AND MAINTENANCE MANUALS

The contractor shall provide manual(s) prepared to the minimum content listed below. The manual is to be used for operation, maintenance, repair and logistic support for the PV/Diesel Ice Making Plant. All manuals shall be delivered to EEA/USAID for review at least 30 days prior to the arrival of equipment at the site. All manuals shall be in English. Manual(s) will be revised as needed and a final set submitted not later than 30 days after the

completion of the 30-day acceptance testing period. The minimum requirements for the manual(s) shall include chapters on the following subjects:

### 8.1 System Description

This chapter shall include but not be limited to the following:

- a full page composite illustration of the PV/Diesel Ice Plant equipment and layout
- an illustration(s) calling out the major assemblies
- a basic description of the type of equipment and its purpose
- a function block diagram
- tables listing equipment supplies and equipment required but not supplied, if any
- tables of technical, environmental and physical characteristics, as appropriate

### 8.2 System Installation

This chapter shall include:

- information on unpacking and proper location of equipment
- interconnections and initial pre-operational adjustments
- details of structure, cables and foundation requirements (as applicable)
- operating ranges (voltage, current for each equipment item and system.

### 8.3 System Operation

This chapter shall include:

- step-by-step procedures for starting, operating and stopping the equipment
- meter readings and/or results expected from properly adjusted and operated equipment
- tables and illustrations calling out all operational controls and indicators and their functions (all references to controls and indicators throughout the manual shall follow these designations)
- means for adjusting array tilt angle

#### 8.4 Principles (or Theory) of Operation

This chapter shall include:

- a functional description of the equipment, based on a block diagram
- for complex mechanical features, a complete explanation, using block diagrams, exploded views or cutaway drawings.
- major assemblies broken into individual circuits, accompanied by complete circuit analysis keyed to simplified schematic
- brief description of conventional circuits
- detailed descriptions of complex and novel circuits
- typical daily power, load, and state of charge curves for each component

#### 8.5 Maintenance (Preventive/Corrective)

This chapter shall include:

- a maintenance schedule for all equipment including adjustments and procedures
- list of recommended test equipment
- lubrication data
- information that permits a technician to locate trouble and to make replacements, repairs or adjustments to the equipment
- for complex equipment or where the procedure is not obvious, an outline of disassembly and reassembly procedures (diesel)
- details of special test procedures
- completed adjustment and maintenance information for relays and other electro-mechanical devices
- Tools required for maintenance.

#### 8.6 Parts List

The parts list shall consist of a tabulation of descriptive data on all electrical components and repairable/replaceable commercial or vendor mechanical components in the equipment. All parts shall be sufficiently described to

implement reorder/replacement. The parts list shall contain at least the following information:

- (a) Reference designation
- (b) Name and description of part
- (c) True Manufacturer's code and part number (and list of manufacturer's codes and addresses)
- (d) Quantity

#### 8.7 Drawings

In addition to drawings previously specified, the following shall be included:

- (a) Schematic diagrams of individual major components, printed wiring boards and, where applicable, or the completed equipment
- (b) Logic diagrams
- (c) Interconnection diagrams
- (d) Cabling diagrams
- (e) Wiring diagrams

#### 9.0 SPECIAL PROVISIONS

##### 9.1 Site Access and Local Labor Provision

Employees and representatives of the Contractor and personnel conducting business with the Contractor relating to this Contract, will be granted a revocable permit to enter the Wadi El Raiyan area for the purpose of installation, operation, and/or maintenance of the facilities and equipment providing electrical energy under this Contract. Access to and movement within this area are subject to restrictions and provisions of the security instruction in effect.

It is the Contractor's responsibility to maintain satisfactory labor relations with his employees. Representatives of the Contracting Officer will not participate in labor relations matters unless disputes develop that interfere with the proper performance of the contract, at which time the representative

may endeavor to assist in settling the difficulty. The contractor is encouraged to hire local labor whenever possible.

#### 9.2 Protection of the Environment and Personnel

During all operations, all EEA and local environmental and labor requirements shall be rigorously observed. The EEA will retain the right to suspend any operation judged to present an imminent threat to the environment or personnel, or a violation of applicable labor laws and regulations or natural resources management agreements, after giving notice to the Contractor.

#### 9.3 Public Release Information

There shall be no public release of information or photographs concerning the aspects of this Contract or other documents resulting from this Contract without prior written approval of the EEA.

#### 9.4 Pre-Award Survey

The EEA/USAID may make a pre-award survey to the facilities of any apparently successful bidder to determine whether or not such bidder is adequately qualified to perform the requirements of any Contract that may be awarded on the basis of this specification. Investigation may be conducted to determine that the Contractor does regularly engage in the performance of work of the type covered by the specification and has a satisfactory record of performance in this field. The bidder is required to submit information, as well as any other related material, requested by EEA/USAID audit agencies during the course of the preaward survey.

#### 9.5 Minimum Proposal Requirements

The contractor is required to submit as part of the proposal the following:

- o Organization Chart. Show the organization for accomplishing and managing the project. Explain briefly the responsibilities of each element shown on the organizational chart. Identify key personnel by

name in each element and submit their curriculum vitae (resumes). Show the lines of authority within the organization. If important portions of the project are to be subcontracted (e.g., design of the system), identify the subcontracted function, the subcontractor(s), the subcontractor's key personnel, and which elements of the organization will manage the subcontract(s).

- o Key Personnel and Resumes. Provide resumes of key personnel, including those of the subcontractor(s). Be explicit in identifying past training and experience of each individual which qualifies him/her for the position to be held in the organization.
- o Staffing Plan. Indicate the type and approximate number of skilled personnel required in each element of the organization chart. State whether or not the required personnel are available within the organization. If not, comment on the availability of needed skilled personnel within the labor force and outline a schedule and plan for recruitment and/or training.
- o Related Experience. For each of the categories of experience below, list and describe projects or contracts which have provided your firm or that of your proposed subcontractor with related, qualifying experience. The descriptions should include: (1) dates during which the work was accomplished; (2) the scope and price of the total project or contract; (3) statement of what portion of the total project or contract was accomplished by your firm, i.e., an explicit description of the responsibilities or role of your firm; (4) financing arrangements; (5) references; (6) approximate payment for your service; (7) number of similar projects, location and contact person.
  - Construction Projects. List and discuss projects or contracts providing experience in the construction of facilities, particularly those using PV/Diesel hybrid systems.
  - Operation and Maintenance of PV/Diesel/Ice-making Systems. List and discuss projects or contracts providing experience in the operation and/or maintenance of PV/Diesel and ice-making systems. For each of the items listed, state which of the following functions were the responsibility of your firm; (a) start-up of facilities; (b) operation of facilities; (c) routine maintenance; (d) periodic overhaul of facilities. Also, state what type of facilities were included; (e) PV systems; (f) controls; (g) electrical switchgear and protection equipment; (h) other. If "other" is listed, please identify or explain.

#### 9.6 Post-Award Site Visit

Upon contract award, winning contractor personnel are expected to inspect the Wadi Raiyan site to satisfy themselves as to all general and local conditions that may affect the design and installation of the PV/Diesel/Ice-making system. EEA/USAID, and/or authorized representative personnel will be available at that

time for detailed discussions prior to initiation by the contractor of detailed system design.

9.7 Summary of Deliverables

(1) Contract Documentation Schedule

ACTIVITY	WEEKS AFTER CONTRACT AWARD*
(a) Project Schedule.....	2
(b) EEA/USAID Approval of Project Schedule.....	5
(c) Detailed Design Complete.....	9
(d) EEA/USAID Design Review Complete (Authorization to proceed).....	13
(e) Written Results of Component/Subsystem In-Factory Testing.....	Within 2 weeks of test completion
(f) System Operations and Maintenance Manuals.....	Within 4 weeks of system acceptance
(g) Unscheduled Maintenance Reports.....	As required to document unscheduled maintenance through- out the 2-year support period

(2) Contract Hardware Installation Schedule

(a) Site Preparation Complete, Hardware Delivered to Site.....	Day 0 (D)
(b) Construction Completed, PV/Diesel Interconnected with the Ice-maker.....	D + 120 days
(c) System Acceptance Test Complete.....	D + 150 days
(d) Final System Drawings and System Operations and Maintenance Manual Submitted.....	D + 180 days

\* In this schedule, one week is allowed for transmittal and receipt of documents mailed from either the United States or Cairo.

APPENDIX A

Solar, Ambient and Water Temperature Data

APPENDIX A

Insolation

(Source: Published research by Dr. Mossallan  
Shaltout of the Egyptian Meteorological  
Authority)

Horizontal Global Average Daily Insolation

EL FAYOUM EGYPT      LAT=29

	SOLAR (kWh/day)	TEMP °C	REFLEC*
JAN	3.81	15.2	.20
FEB	4.9	16.2	.20
MAR	6.0	18.6	.20
APR	7.4	22.2	.20
MAY	7.6	26.1	.20
JUN	8.1	28.7	.20
JUL	8.1	30.2	.20
AUG	7.5	29.8	.20
SEP	6.7	27.4	.20
OCT	5.2	25.4	.20
NOV	4.0	21.2	.20
DEC	3.4	16.3	.20

\* Estimated for sand

Ambient Temperature

(Source: El Giza + 2 degrees Centigrade)

MONTH	MAX	MIN	MEAN
JAN	22.2	8.1	15.2
FEB	23.7	8.6	16.2
MAR	26.4	10.7	18.6
APR	30.7	13.7	22.2
MAY	34.7	17.6	26.1
JUN	36.8	20.6	28.7
JUL	37.8	22.5	30.2
AUG	37	22.5	29.8
SEP	34.4	20.4	27.4
OCT	32.6	18.1	25.4
NOV	28.2	14.2	21.2
DEC	22.6	10.1	16.3

Water Temperature

(Source: Rafik Georgy, based on FA data)

8 - 28 Degrees Centigrade

APPENDIX B

Selected pages from

Inorganic Pollutants In El-Faiyum  
Aquatic Environment

Reference: Supreme Council of Universities  
Foreign Relations Co-ordination Unit  
Report No. 2: Aug. 1, 1984 - Nov. 30, 1984  
Report No. 3: Dec. 1, 1984 - Feb. 28, 1985  
Report No. 4: Mar. 1, 1985 - April 30, 1985

Principal Investigator:  
Dr. Mahmoud Abbas Saleh  
Professor of Chemistry  
Faculty of Agriculture  
Cairo University



GRANT  
FRCU 842020

INVESTIGATION OF INORGANIC  
POLLUTANTS  
IN EL FAIYUM AQUATIC  
ENVIRONMENT

Principal Investigator  
Dr. Mahmoud Abbas Saleh  
Professor of Chemistry  
Faculty of Agriculture, Cairo University

Report No. 2.

August 1st to November 30, 1984

## RESULTS

This section presents results of the detailed chemical and biological studies of samples and specimens which were collected during the first expedition. It also presents results which were either obtained by direct measurements in the field or by visual observation and photography. General features and description of studied area were shown in details in our first report.

### Chemical Results:

Inorganic pollutants in water and selected food chain were determined stations locations of the Wadi El-Raiyan and water springs are shown in Figure 1. The concentration of some important non metallic pollutants and some physical measurements are shown in Table 1 and table 2 respectively. Concentration of heavy metals in water samples of Wadi El-Raiyan drainage canals and soil samples are shown in Tables 3, 4 ,5 respectively. Concentration of heavy metals in biological samples is shown in Tables 6-10.

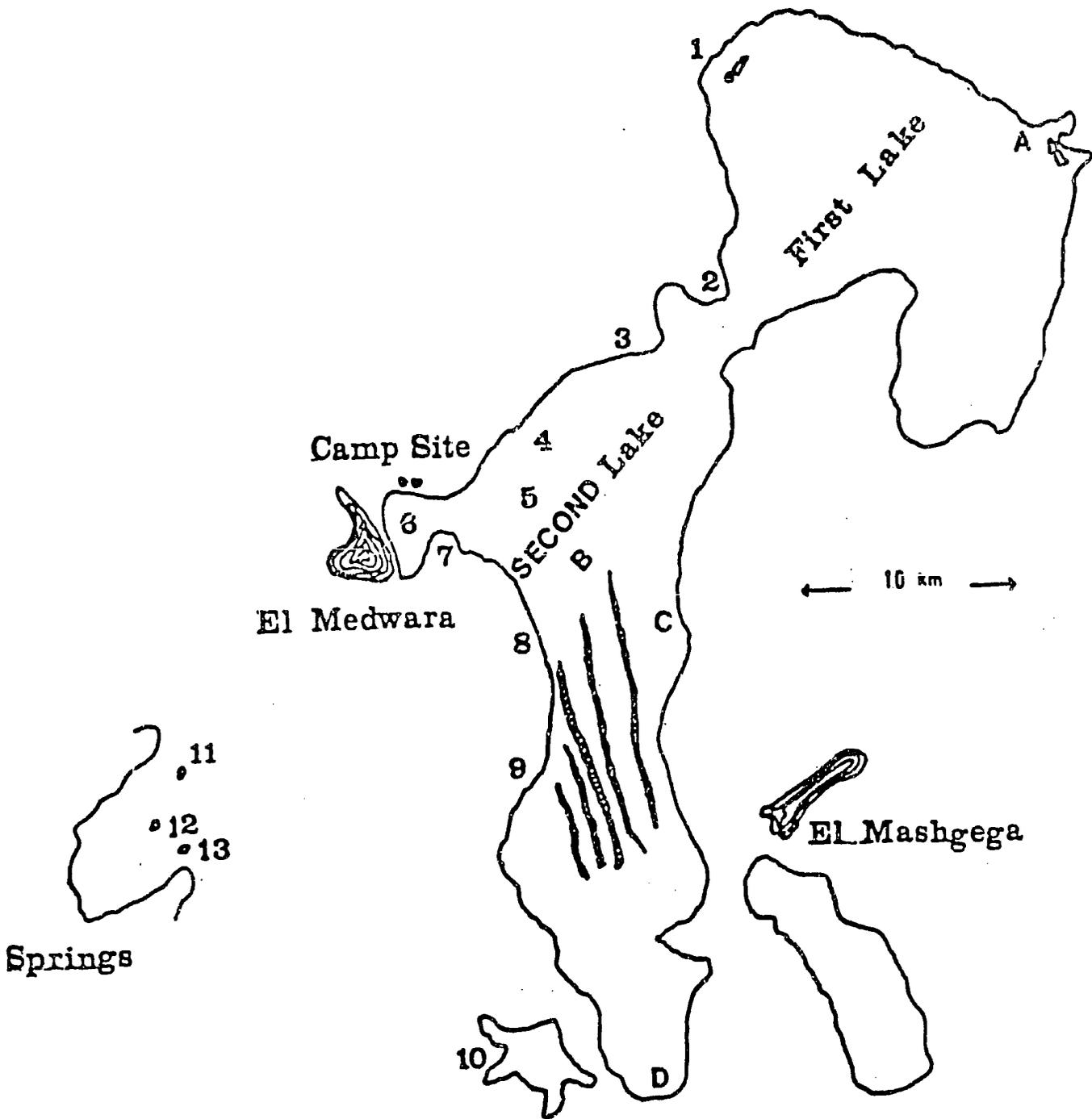


Figure 1. Map of the Selected Stations of Wadi El-Raiyan Lakes and Water Springs.

Table 1. Concentration of Nonmetallic Inorganic Ions in Water (mg/L = ppm)

Station/Depth	Sulfate $SO_4^{2-}$	Sulfite $SO_3^-$	Bisulfide $HS^-$	Nitrate $NO_3^-$	Nitrite $NO_2^-$	Ammonium $NH_4^+$	Ammonia $NH_3$	Chloride $Cl^-$	Bromide $Br^-$	Iodide $I^-$	Thiocyanate $SCN^-$	Oxygen $O_2$
1 Surface	520	0.000	0.010	105	0.016	0.030	0.022	534	0.006	0.9	0.008	10.8
2 Surface	750	0.002	0.040	160	0.002	0.050	0.040	663	0.005	1.0	0.003	10.8
3 Surface	1155	0.002	0.010	118	0.011	0.080	0.060	881	0.006	1.3	0.007	10.0
4 Surface	970	0.000	0.000	137	0.004	0.050	0.040	1346	0.006	1.1	0.006	9.4
10m	702	0.000	0.000	147	0.002	0.050	0.040	1336	0.006	1.2	0.005	8.5
5 Surface	1045	0.000	0.010	137	0.005	0.050	0.040	1425	0.010	0.8	0.006	9.0
5m	630	0.000	0.010	147	0.009	0.025	0.020	1445	0.010	1.3	0.009	8.8
10m	682	0.000	0.010	143	0.009	0.025	0.020	1326	0.026	1.6	0.004	8.2
6 Surface	425	0.000	0.010	109	0.012	0.050	0.040	147	0.006	0.8	0.007	9.4
2.5m	370	0.015	0.015	81	0.012	0.120	0.100	1366	0.006	0.8	0.003	9.2
7 Surface	1156	0.008	0.010	10	0.002	0.050	0.040	1425	0.008	0.8	0.004	8.0
8 Surface	830	0.020	0.015	127	0.002	0.060	0.048	1445	0.020	0.9	0.006	8.5
9 Surface	820	0.025	0.008	105	0.005	0.100	0.080	1336	0.023	1.3	0.006	9.0
10 (Seepage)	945	0.000	0.010	118	0.010	0.000	0.000	8405	0.026	1.6	0.004	7.4
Average value	781	0.005	0.011	117	0.007	0.053	0.042	1128	0.012	1.1	0.005	9.07
11 Origin	417	0.005	0.030	4	0.005	0.075	0.060	2257	0.006	1.3	0.006	11.8
12 Origin	520	0.000	0.200	11	0.004	0.600	0.470	2316	0.008	1.1	0.000	4.8
13 Origin	410	0.005	0.060	2	0.000	0.120	0.100	1772	0.002	0.8	0.000	9.0
Pool	440	0.008	0.020	3	0.000	0.100	0.080	1881	0.003	0.7	0.000	10.8
Average value	447	0.004	0.077	5	0.002	0.224	0.177	2056	0.005	0.9	0.001	9.1

- Phosphate concentration in all stations was less than 0.1 ppm, None of the cyanide or arsenite were detected.
- The results are the average of three measurements.

Table 2. Physical Properties of Water Sample of Wadi El-Palyan.

Station/Depth	pH		Salinity		Electric conductivity		Hardness		T.S.S (mg/L)	
	July	Nov.	July	Nov.	July	Nov.	July	Nov.	July	Nov.
1 Surface	7.5	8.5	1.4	1.0	33	20	18	18	1690	1024
2 Surface	7.5	8.0	1.4	1.2	32	20	17.6	19	1636	1024
3 Surface	7.2	8.0	1.4	1.3	30	21	26.8	19	1536	1075
4 Surface	7.0	8.2	3.2	2.8	71	42	36.1	28	3635	2150
10m	7.5	8.5	3.2	3.0	72	42	35.0	29	3686	2150
5 Surface	7.3	8.0	3.2	3.2	72	52	34.8	32	3686	2662
10m	7.8	8.5	3.0	3.2	72	30	37.1	31	3686	2560
6 Surface	7.2	8.0	3.4	3.5	73	52	39.4	27	3738	2662
2.5m	7.2	8.2	3.1	3.3	74	52	39.0	34	3798	2662
7 Surface	7.5	8.2	3.0	3.2	70	51	36.1	29	3564	2611
8 Surface	7.2	8.2	3.0	3.6	46	55	34.0	30	2355	2816
9 Surface	7.2	8.2	3.3	3.5	68	45	43.0	38	3491	2304
10 Surface	6.0	8.5	33.3	26.0	760	370	270.0	100	38912	18944
Average	7.4	8.2	2.8	2.8	60	43	33	28	3072	2201
11 Origin	7.5	7.5	4.3	4.0	98	72	67	62	5018	3686
12 Origin	8.5	7.2	4.3	4.5	99	62	60	51	5069	3174
13 Origin	7.8	7.5	3.6	4.6	99	55	58	43	5069	2816
Pool	7.8	8.0	4.7	3.8	100	52	55	43	5120	2662
Average	7.9	7.6	4.2	4.2	99	60	60	50	5069	3072

Water temperature was 25-28°C during July and 12-20°C during November.

Table 3. Concentration of Heavy Metals in Water Samples of Wadi El-Raiyan  $\mu\text{g/L}$  (ppb).

Station/Depth	Copper Cu	Iron Fe	Lead Pb	Manganese Mn	Mercury Hg	Selenium Se	Zinc Zn
1 Surface	1.3	70	31.5	13.2	50	8.8	4.3
2 Surface	8.5	190	28.0	4.5	50	8.8	22.0
3 Surface	8.5	350	50.0	14.2	90	8.8	25.0
4 Surface	3.3	340	47.5	21.5	97	8.8	14.3
10m	4.0	350	50.0	20.1	90	8.8	15.0
5 Surface	4.8	58	38.0	4.5	30	20.0	4.0
5m	6.0	100	57.5	13.3	10	18.5	27.5
10m	5.5	670	37.5	5.3	55	20.0	6.3
6 Surface	10.0	310	28.0	7.3	50	19.0	7.4
2.5m	2.5	35	32.5	1.5	10	20.0	7.5
7 Surface	10.0	332	48.7	25.7	55	9.0	28.7
8 Surface	8.0	207	55.0	14.5	55	0.25	18.5
9 Surface	2.0	555	72.5	19.8	40	12.5	26.5
10 Surface	9.0	362	131.2	20.7	69	20.0	11.7
Average	6.0	281	50.6	13.3	54	13.0	15.6
11 Origin	7.8	213	87.5	15.8	10	12.5	32.0
12 Origin	10.0	1337	31.3	65.0	5	16.3	35.0
13 Origin	4.5	68	48.8	6.8	3	12.5	2.5
Pool	3.3	1020	70.0	55.0	4	7.0	7.3
Average	6.4	660	59.4	35.6	5.5	12.0	19.2

Table 4. Concentration of Heavy Metals in El-Faiyum Drainage Canals,  $\mu\text{g/L}$ (ppb)

Station	Copper Cu	Iron Fe	Lead Pb	Manganese Mn	Mercury Hg	Selenium Se	Zinc Zn
1 مصرف الخميس - أبوكساه	7.8	981	24.0	46.6	5.0	10.6	35.0
2 مصرف شعلان - شعلان	19.7	1768	51.8	259.0	45.0	7.5	67.5
3 مصرف الفرق الرئيسي عزة أبو طالب	8.9	422	31.6	43.1	85.2	9.5	23.6
4 مصرف الفرق عزة الاصفاف	18.5	231	27.5	52.4	39.6	2.7	7.8
5 مصرف المنهس - عزة الباسل	22.7	714	35.1	175.8	50.6	2.6	27.9
6 مصرف الكمال - هواره المقطع	19.7	1412	33.3	168.5	68.5	4.4	69.3
7 مصرف الكمال - الالهون	18.8	1105	52.6	378.0	49.5	8.2	58.8
Average	16.7	947	36.5	160.4	49.0	6.5	41.4

Table 5. Concentration of Heavy Metals in Wadi El-Raiyan Soil  
mg/ kg (ppm).

Sample	Copper Cu	Iron Fe	Lead Pb	Manganese Mn	Zinc Zn
1	0.14	24.2	2.5	0.32	1.36
2	0.12	10.1	3.9	0.15	1.13
3	0.24	18.1	13.9	0.25	1.19
4	1.29	33.5	0.7	0.70	2.39
5	0.10	21.2	2.6	0.95	0.75
6	0.09	11.0	0.9	0.24	1.19
7	0.05	14.4	0.6	0.24	0.78
8	0.05	9.1	1.7	0.18	0.69
9	0.15	20.2	1.4	0.39	0.75
10	0.04	10.0	0.6	0.19	0.47
11	0.04	14.3	0.7	0.25	0.63
12	0.09	29.0	1.4	0.37	0.67
Average	0.20	17.9	2.6	0.35	1.0

Table 6. Concentration of Heavy Metals in Selected Plants of Wadi El-Raiyan,  $\mu\text{g/g}$  dry weight (ppm).

Species/Location	Copper Cu	Lead Pb	Mercury Hg	Selemium Se	Zinc Zn
<u>Phragmites anstralis</u>					
1	3	59			14
2	4	50			16
3	4	60			17
8	1	75			9
<u>Tamarix sp.</u>					
2	1	48			31
7	0	48	105	6	13
<u>Juncus rigidus</u>					
2	6	49			2
<u>Najas armata</u>					
	3	84			6

Table 7. Concentration of Heavy Metals in Selected Algae, Planktons and Insects of Wadi El-Raiyan  $\mu\text{g/g}$  dry weight (ppm)

Species/Location	Copper Cu	Lead Pb	Mercury Hg	Selenium Se	Zinc Zn
<b>Algae</b>					
11	8	64			32
12	6	87			39
13	2	117	64	45	54
<b>Planktons</b>					
2	2	59	75	40	0.0
5	1	200			0.0
<b>Insects</b>					
Ants	100	1054			0.0
Crickets	16	106	1256	330	0.0

Table 8. Concentration of Heavy Metals in Fishs  $\mu\text{g/g}$  dry weight (ppm).

Species/Location, part	Copper Cu	Lead Pb	Mercury Hg	Selenium Se	Zinc Zn
<u>Tilapia Zilli.</u>					
drainage canal St. 2					
whole body	13	55	68	86	149
intestine	3	54			63
fins and tail	0	179			453
draing canal St. 3					
whole body	13	67			84
intestine	6	57			86
fins and tail	0	921			0
Jraing canal St. 4					
whole body	2	63			59
intestine	6	69			58
fins and tail	3	956			415
drainage canal st. 6					
whole body	6	66			191
intestine	7	200			170
fins and tails	3	1100			200
<u>Wadi El-Raiyan Lakes</u>					
St.6					
whole body	3	60	60	43	1
intestine	2	65			50
fins and tail	6	300			3
St.3					
whole body	1	86			49
intestine	11	82			40

**Table 9.** Concentration of Heavy Metals in Birds of Wadi El-Raiyan  $\mu\text{g/g}$  dry weight (ppm).

Species/Part	Copper Cu	Lead Pb	Mercury Hg	Selenium Se	Zinc Zn
<u>Egretta garzetta</u>					
Whole body	17	323	101	76	96
brain	1	5000			0
feathers	16	791			23
liver	20	66			60
kidney	17	550			254
<u>Vanellus spinosus</u>					
whole body	7	114			80
feathers	148	2100			93
kidney	7	246			145
<u>Acrocephalus stentoreus</u>					
whole body	5	310			57

Table 10. Concentration of Heavy Metals in Mammals  $\mu\text{g/g}$  dry weight (ppm).

Species/part	Copper Cu	Lead Pb	Mercury Hg	Selenium Se	Zinc Zn
<u>Gerbillus gerbillus</u>					
whole body	8	60	88	52	44
liver	0	1630			360
Kidney	1	3700			3000
heart	59	2941			476
<u>Canis aureus</u>					
feces	18	100			126

It appears from Tables 1 - 4 that water salinity and the amounts of total soluble salts (TSS) increased from the water inputs and moving toward the second lake reaching values of 34 part per thousand (‰) in some of the seepage area with a 38.9 g/L of soluble salts, this value is extremely high but it is not considered as a part of the lake. Salinity of the drainage canals and at the Wadi El-Raiyan tunnel was about 0.5 ‰. Water pH was very much the same throughout the lakes being slightly basic and ranging from 7.0 to 7.8 during July and from 8.0 to 8.5 during November. Water hardness also increased from the water inputs and movements toward the second lake. Water temperature was 25 -28°C during July and 12-20°C during November. Dissolving oxygen in water was 7.4 mg/L in the seepage areas which is characteristic with very high salinity and 10.8 mg/L in the first lake with a low salinity. Heavy metals concentrations in water was relatively low and below the recommended levels for general uses and also below the permissible values for public water supplies as shown in Figure 2 and Table 11. Lead concentration ranged from 28 to 72 microgram/liter (ppb) with an average of 50 ppb. Zinc from 4 to 29 ppb with an average of 16 ppb, copper from 1 to 10 ppb with an average of 6 ppb, selenium from 0.25 to 20 ppb with an average of 54 ppb, iron concentration ranged from 35 to 670 ppb with an average of 280 ppb, manganese ranged from 1.5 to 25 ppb with an average of 13 ppb. No arsenic was found in any of the examined stations. Heavy metals concentrations in El-Faiyum drainage canals were

RFP FT#6

21.330

93773 AHEMB UNWU0

93773 AHEMB UH

EASYLINK 2469320ADD1 7OCT86 14:35/14:36 EST

FROM: 62837231

CHRONAR TRISOLAR

TO: 92793773

TO: USAID - EGYPT

ATTN: ERIC PETERSON  
ENERGY PROGRAM OFFICER

CC: ORION YEANDEL  
CONTRACTING OFFICER

OUR REF NO: 100786.01

IN RE: SOLICITATION NO: 263-50048 SOLAR ICE PLANT

- 1) PG 15 STATES FPV ARRAY...SHALL BE SIZED TO MEET 40 PCT OF AVERAGE DAILY ENERGY DEMAND OVER THE YEAR...+. IT IS CLEAR FROM RFP THAT LOAD DURING 6 MONTH PERIOD OCT-MAR IS 5-6 TONS/DAY. IT IS NOT CLEAR WHAT ENERGY DEMAND IS DURING OTHER THREE FISHING MONTHS OF APR, MAY, AND SEPT, AND DURING NON FISHING MONTHS OF JUN, JUL, AND AUG. WE NEED CLARIFICATION OF ENERGY DEMAND DURING THESE MONTHS TO INSURE COMPLIANCE WITH YOUR PG 15 STATEMENT. PLS REVERT WITH ANSWER.
- 2) DOES LAKE EDGE RECEDE AND DOES LAKE SURFACE RISE AND FALL SEASONALLY? WE NEED ANSWER TO THIS TO INSURE ICE PLANT INLET DOES NOT BECOME UNCOVERED.
- 3) IS LAKE TEMPERATURE GIVEN IN RFP AT SURFACE, BOTTOM OR AVERAGE? WHAT IS TEMP PROFILE TOP TO BOTTOM? CAN WE ASSUME AVE LAKE TEMP EQUAL TO AVE AIR TEMP ON MONTH BY MONTH BASIS?
- 4) I WILL TRY TO CONTACT YOU BY TELEPHONE TOMORROW, WED 8 OCT FOR ANSWERS TO THESE QUESTIONS AND QUESTIONS OF MY 3 OCT TLX (REF NO: 100386.01) INCLUDING ANSWER TO REQUEST FOR EXTENSION. ALSO PLS SEND OFFICIAL TLX RESPONSES (SEE TLX NO UNDER MY NAME BELOW).

REGARDS,

RONALD W. MATLIN  
PRESIDENT  
CHRONAR TRISOLAR, INC.  
314547 (TRISOLAR)

HHHH

WU0  
93773 AHEMB UN

S/a

18.280  
93773 ANEMB UHWO  
93773 ANEMB UN

EASYLINK 1925393A001 30OCT86 11:30/11:31 EST  
FROM: 62837231  
      CHRONAR TRISOLAR  
TO: 92793773

TO: USAID - EGYPT

ATTN: ERIC PETERSON  
      ENERGY PROGRAM OFFICER

CC: ORION YEANDEL  
      CONTRACTING OFFICER

OUR REF NO: 100386.01

IN RE: SOLICITATION NO. 263-50048 SOLAR ICE PLANT

- 1) RFP REQUIRES SUBMITTAL OF EXTENSIVE INFORMATION AND DUE DATE OF 27 OCT GIVES INSUFFICIENT TIME TO PROPERLY PREPARE BID. RFP DELIVERED ONLY TWO WEEKS AGO. WE REQUEST THE DUE DATE BE EXTENDED BY 30 DAYS. PLS ADVISE YR DECISION BY TLX SOONEST.
- 2) PG 5 OF RFP STATES +CIVIL WORKS WOULD BE PERFORMED LOCALLY BY THE EEA/ERDA....+. REMAINDER OF RFP PLACES CIVIL WORKS RESPONSIBILITY ON CONTRACTOR. PLEASE CLARIFY CONTRADICTION.
- 3) VERTICAL RISE FROM LAKE SURFACE TO ICE PLANT LOCATION NOT GIVEN IN RFP. THIS IS NEEDED TO CALCULATE POWER FOR WATER PUMP. PLS REVERT WITH THIS INFORMATION.
- 4) RFP DOES NOT DISCUSS ICE HANDLING FROM STORAGE BUILDING. DO YOU REQUIRE ANY SPECIAL EQUIPMENT FOR THIS SUCH AS CONVEYOR BELT OR RAISED LOADING DOCK OR DO YOU PLAN TO JUST USE SHOVELS AND WHEELBARROWS?
- 5) ARE THE PREFERRED VOLTAGES FOR THE EGYPTIAN SITE 220V 50 HERTZ SINGLE PHASE AND 380V RMS THREE PHASE, 4 WIRE?

REGARDS,

RONALD W. MATLIN  
PRESIDENT  
CHRONAR TRISOLAR, INC.  
314547(TRISOLAR)

*PUMPING HEAD IS 5 METERS,  
10 METERS MAX INCLUDING  
FRICTIONAL LOSSES IN THE PIPE.*

MMMM

WUO  
93773 ANEMB UN

*5/2*

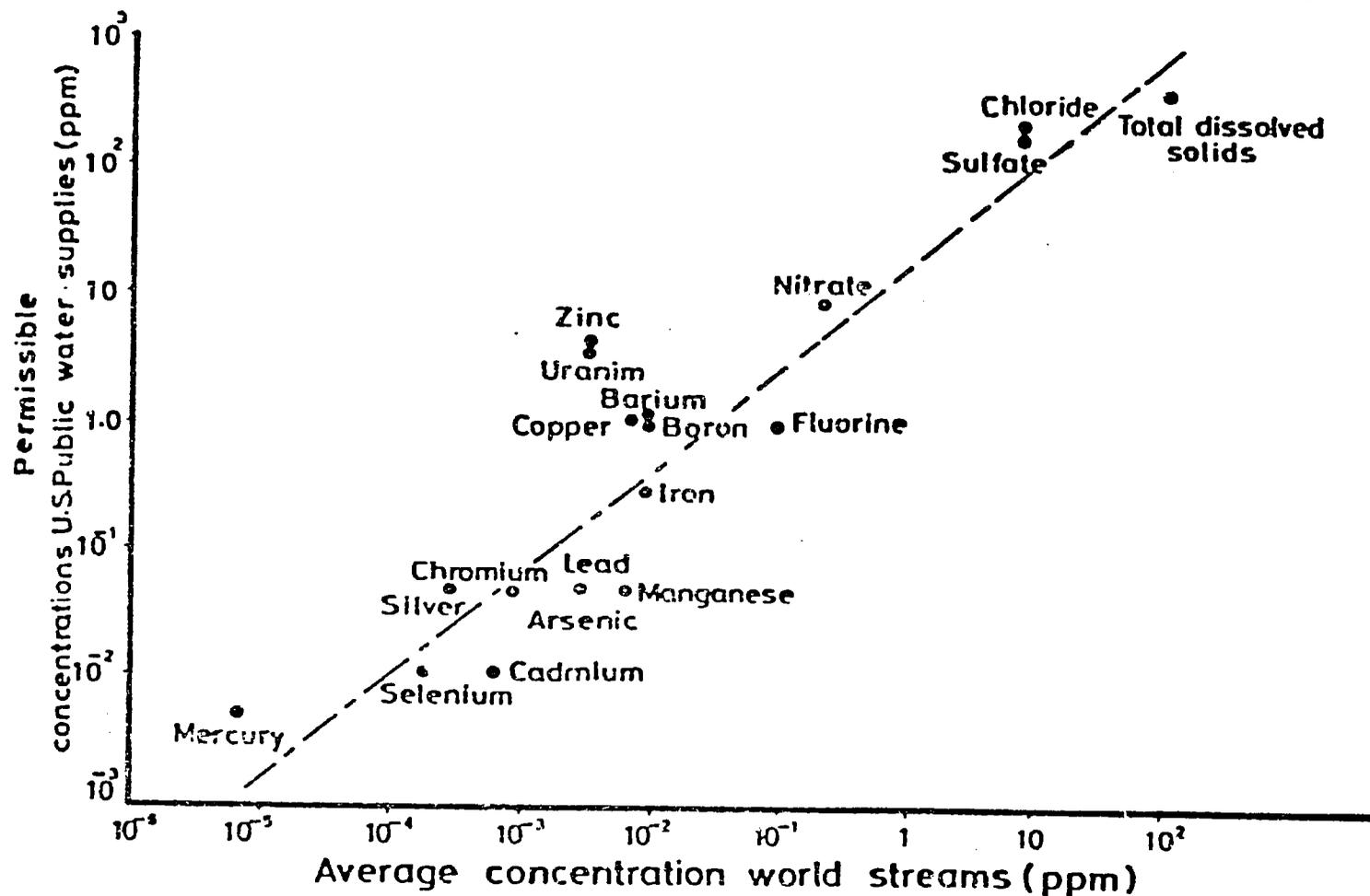


Fig.2 : Correlation between trace element concentrations in streams and permissible concentrations in water supplies :

Table 11. Parameters and Criteria For Domestic Water Supplies

Quality Parameter	Undesirable effect	Minimum desirable level	Maximum Permissible level
Substances causing discoloration	discoloration	5 units	50 units
Substances causing odour	odours	unobjectionable	unobjectionable
Substances causing taste	Taste	unobjectionable	unobjectionable
Suspended matter	Turbidity	5 units	25 units
Total solids	Taste, gastrointestinal irritation	500 mg/l	1500mg/l
pH value	Taste, corrosion	7.0-8.5	6.5-9.2
Anionic detergents	Taste and foaming	0.2mg/l	1.0mg/l
Mineral oils	Taste and odour after chlorination	0.01mg/l	0.3 mg/l
Phenolic compounds	Taste and odour after chlorination	0.001mg/l	0.002mg/l
Total hardness (as CaCO <sub>3</sub> )	Excessive scale formation	100mg/l	500mg/l
Calcium(as Ca)	Excessive scale formation	75 mg/l	200 mg/l
Chloride (as Cl)	Taste, corrosion in hot water system	200 mg/l	600 mg/l
Copper (as Cu)	Taste and corrosion	0.05mg/l	1.5mg/l
Iron (as Fe)	Taste, Turbidity, growth of iron bacteria	0.1mg/l	1.0mg/l
Magnesium(as Mg)	Hardness, taste and gastrointestinal irritation in the presence of sulphate	30mg/l	150gm/l
Manganese(as Mn)	Taste, turbidity dis-colouration	0.05mg/l	0.5mg/l
Sulphate	Gastrointestinal irritation when magnesium or sodium are present.		

Table 11. Continued

Quality Parameter	Undesirable effect	Minimum desirable level	Maximum permissible level
Zinc (as Zn)	Taste turbidity and sand like deposits	5.0mg/1	15mg/1
Nitrates (as N)		absent	15gm/1
Fluorides		0.6-0.9mg/1	0.8-1.7mg/1
Arsenic	Toxic		0.05mg/1
Cadmium	Toxic		0.01mg/1
Cyanide	Toxic		0.05mg/1
Lead	Toxic		0.1mg/1
Mercury	Toxic		0.001mg/1
Selenium	Toxic		0.01mg/1
Organic chemicals	Taste	0.04mg/1	0.15mg/1
a-carbon chloroform extract (CCE)			
b-Methylene blue active substances			
Pesticides			
Aldrin			0.017mg/1
Chlordane			0.003mg/1
DDT			0.042mg/1
Dieldrin			0.007mg/1
Endrin			0.001mg/1
Heptachlor			0.018mg/1
Lindane			0.056mg/1
Toxophane			0.005mg/1
Radioactively			
Gross beta		100 Pc/1	100 Pc/1
Radium 226		1 Pc/1	3 Pc/1
Strontium 90		2 Pc/1	10 Pc/1

similar to those found in the Wadi El-Raiyan lakes except zinc which was two to three times higher, copper was 5 times higher, iron was 4 times higher and manganese was 7 times higher. Ammonium ion and free ammonia concentration in water was only determined during the second field expedition and was found to be in the range of 0.02 to 0.12 ppm. Dissolved oxygen and ammonium concentration in water are suitable for fish production and may be classified as salmonied water. Inorganic anions concentrations of nitrites, sulfite, sulfide, phosphate and thiocyanate were very low, halides concentration was moderately high, however, sulfate ion concentration was very high as shown in Table 1.

Oxygen concentration in water varied significantly when it was monitored every two hours for 24 hours in one of the station, the concentration of oxygen was minimum of 5 ppm at dawn and maximum of 12 ppm at sunset. Oxygen concentration, salinity, pH and temperature for every 2 hours period are shown in Figure 3.

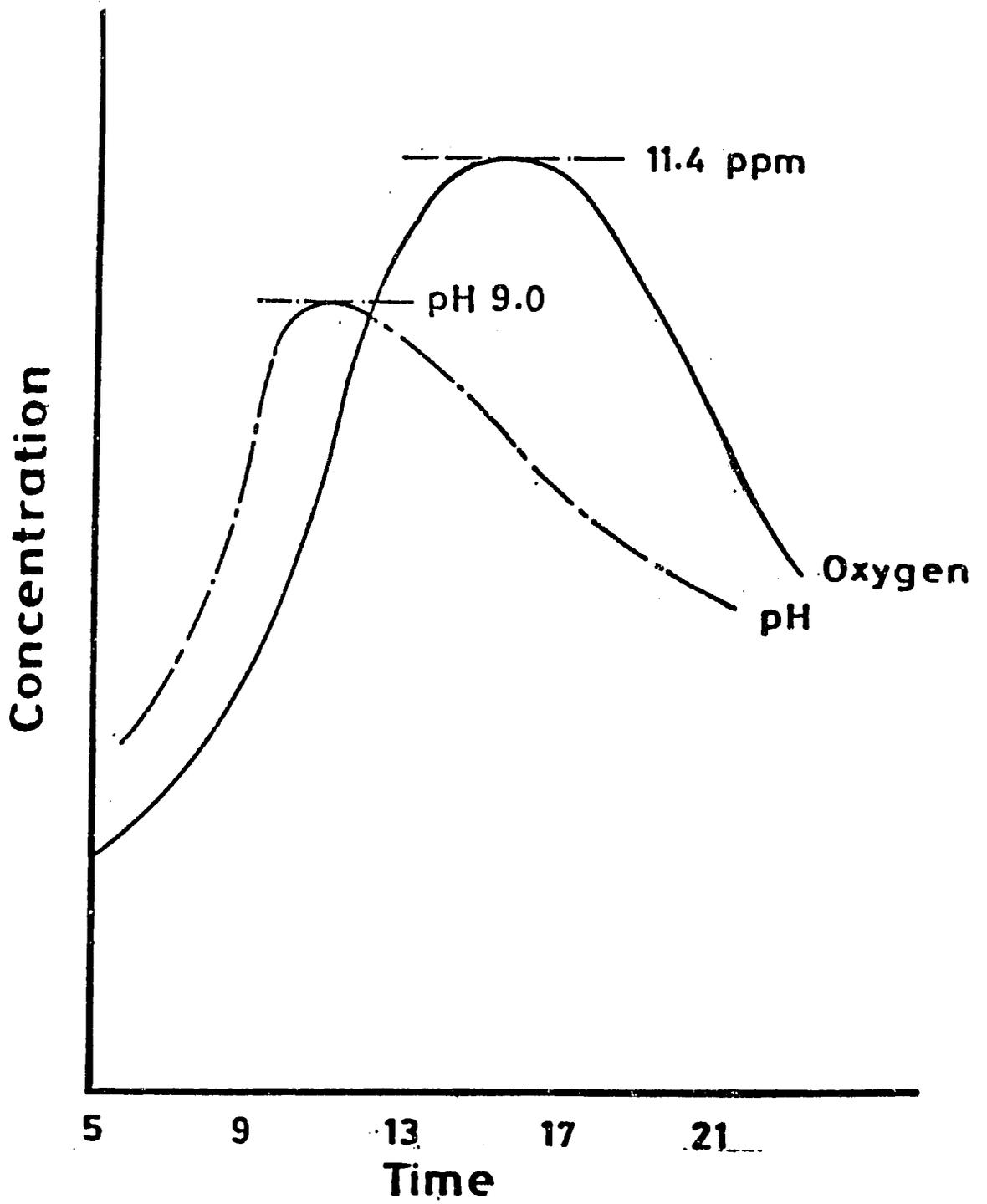


FIGURE 3. OXYGEN CYCLE



GRANT  
FRCU 842020

INVESTIGATION OF INORGANIC  
POLLUTANTS  
IN EL FAIYUM AQUATIC  
ENVIRONMENT

Principal Investigator  
Dr. Mahmoud Abbas Saleh  
Professor of Chemistry  
Faculty of Agriculture, Cairo University

Report No. 3  
December 1st 1984, to February 28, 1985 .....

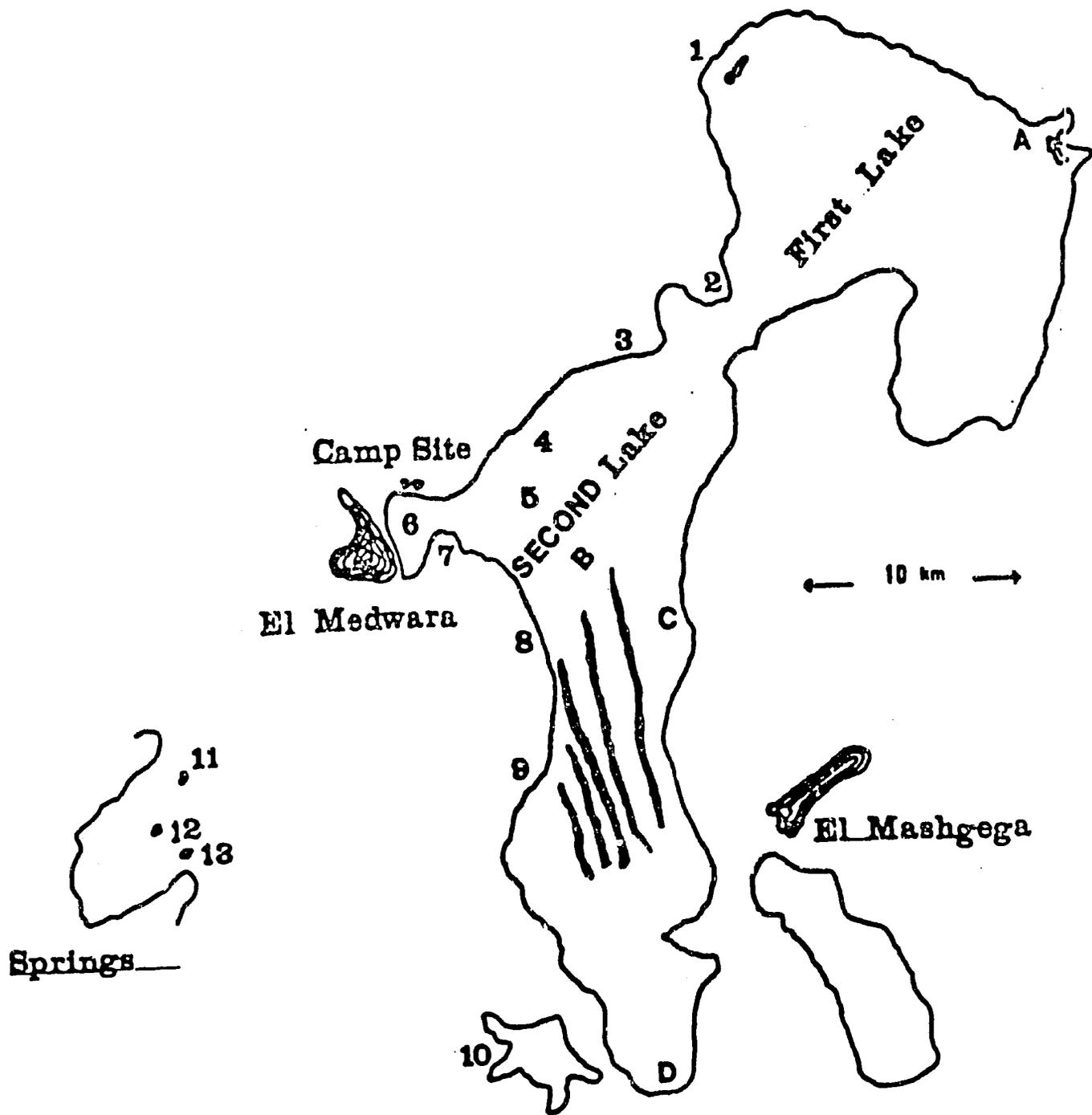
## RESULTS

This section presents results of the detailed chemical and biological studies of samples and specimens which were collected during the second expedition. It also presents results which were either obtained by direct measurements in the field or by visual observation and photography. General features and description of studied area were shown in details in our first and second reports.

### Chemical Results:

Stations locations of the Wadi-El-Raiyan and water springs are shown in Figure 1. The concentration of some important non metallic pollutants and some physical measurements are shown in Table 1 and table 2 respectively. Concentrations of heavy metals in water samples of Wadi El-Raiyan, are shown in Tables 3. Concentration of heavy metals in biological samples is shown in Tables 5 - 7

It appears from Tables 1-3 that water salinity, hardness and amounts of total soluble salts (TSS) followed the same pattern previously shown in our first and second reports, but these values were lower for the second lake and the seepage areas than what was recorded during the field expeditions of July and Novembers, possibly due to dilution. Water pH was very much the same throughout the lakes, being slightly basic and



— Figure 1. Map of the Selected Stations of Wadi El-Raiyan Lakes and Water Springs.

ranging from 7.8 to 8.8. Water temperature was 8-15°C . Dissolving oxygen in water was 6.2 mg/L in the seepage areas which is characteristic with very high salinity and 11.2mg/L in the first lake with a low salinity. Heavy metals concentrations in water was relatively lower than what recorded in the second report, and below the recommended levels for general uses and also below the permissible values for public water supplies. Lead concentration ranged from 4 to 53 microgram/Liter (ppb) with an average of 26 ppb. Zinc from 7 to 389 ppb with an average of 133 ppb, copper from 1 to 16 ppb with an average of 8 ppb, selenium from 0.00 to 12 ppb with an average of 5 ppb, iron concentration ranged from 14 to 630 ppb with an average of 195 ppb, manganese ranged from 0.0 to 6 ppb with an average of 2 ppb. No arsenic was found in any of the examined stations, ammonium ion and free ammonia concentration in water was determined in the field and was found to be in the range of 0.00 to 0.05 ppm. Dissolved oxygen and ammonium concentration in water are suitable for fish production and may be classified as salmonid water. Inorganic anions concentrations of nitrites, sulfide, phosphate and thiocyanate were very low, halides concentration was moderately high, however, sulfate ion concentration was very high as shown in Table 1.

Relatively high concentration of cyanide (13 ppb) was detected in the first lake only and near fishing activities which might be a result of illegal uses of cyanide for fishing.

Table 1 . Concentration of Nonmetallic Inorganic Ions in Water (mg/L = ppm)\*

Station/Depth	Sulfate $SO_4^{2-}$	Sulfite $SO_3^{2-}$	Bisulfide $HS^-$	Nitrate $NO_3^-$	Nitrite $NO_2^-$	Ammonium $NH_4^+$	Ammonia $NH_3$	Chloride $Cl^-$	Bromide $Br^-$	Iodide $I^-$	Thiocyanate $SCN^-$	Oxygen $O_2$	Phosphate $PO_4^{3-}$
1 Surface	565	0.05	0.010	88	0.016	0.030	0.00	495	0.004	1.08	0.007	11.3	0.315
2 Surface	580	0.002	0.040	98	0.002	0.050	0.00	514	0.003	1.32	0.003	11.0	0.367
3 Surface	560	0.002	0.010	94	0.012	0.080	0.00	641	0.004	1.27	0.004	11.4	0.300
4 Surface	785	0.000	0.000	83	0.004	0.050	0.040	1387	0.005	1.48	0.005	10.2	0.315
10 m	740	0.05	0.010	81	0.002	0.050	0.040	1485	0.004	1.45	0.006	8.4	0.250
5 Surface	670	0.000	0.000	82	0.005	0.050	0.040	1307	0.005	1.43	0.004	8.8	0.315
5 m	645	0.000	0.000	83	0.009	0.040	0.030	1337	0.004	1.39	0.004	8.2	0.245
10 m	820	0.000	0.010	84	0.009	0.030	0.020	1387	0.004	1.60	0.004	8.0	0.297
6 Surface	605	0.000	0.000	72	0.012	0.050	0.040	1367	0.006	0.92	0.005	9.3	0.245
2.5 m	515	0.000	0.000	74	0.012	0.005	0.004	1387	0.007	0.92	0.005	9.0	0.280
7 Surface	1285	0.000	0.000	81	0.002	0.050	0.040	1436	0.007	0.83	0.006	8.5	0.245
8 Surface	720	0.020	0.015	72	0.012	0.050	0.040	1445	0.018	1.27	0.005	9.8	0.210
9 Surface	865	0.025	0.000	77	0.012	0.005	0.080	1387	0.021	1.43	0.005	9.5	0.158
10 (Seepage)	1020	0.000	0.000	92	0.010	0.000	0.000	10870	0.022	1.64	0.006	6.2	0.087
A	280	2.000	0.000	96	0.005	0.000	0.000	0.612	0.003	0.84	0.004	11.7	0.380
B	635	1.000	0.010	88.5	—	0.030	0.020	1.308	0.003	1.50	0.005		0.262
C	670	0.000	0.000	73	0.010	0.080	0.060	1.351	0.008	0.63	0.006	11.9	0.193
D	830	—	0.000	79.5	—	0.600	0.470	1.387	0.005	1.08	0.006	14.5	0.315
Average Value	915.92	0.220	0.006	113.32	0.009	0.070	0.050	1159	0.005	1.5	0.005	11.9	
11 Origin	490	0.000	0.000	5.2	0.012	0.000	0.000	2079	0.004	0.42	0.001	9.5	0.028
12 Origin	525	0.000	0.02	8.5	0.004	0.04	0.03	2029	0.003	0.53	0.001	8.5	0.063
13 Origin	410	0.000	0.01	3.2	0.012	0.15	0.120	1902	0.003	0.80	0.000	7.9	0.063
Pool	538	0.000	0.000	2.8	0.000	0.10	0.080	1505	0.003	0.64	0.002	12.6	0.077
Average value	505	0.000	0.02	4.9	0.012	0.096	0.076	1878	0.003	0.59	0.001	7.1	

\* The results are the average of three measurements, None of the cyanide or arsenite ions were detected except a relatively high concentration (13 PPB) of cyanide was detected in the first lake near fishing area.

Table 2. Physical Properties of Water Sample of Wadi El-Raiyan.

Station/Depth	pH	Salinity gm/L	Electric conductivity	Hardness
1 Surface	7.8	1.03		15
2 Surface	8.2	1.01		18
3 Surface	8.4	1.36		17
4 Surface	8.2	1.98	365	30
5 m	8.5	2.17	427	31
5 Surface		2.00	391	33
5 m		2.04	406	32
10 m		2.04	406	34
6 Surface	8.0	2.30	461	32
2.5 m	8.5	2.05	398	36
7 Surface	8.5	2.01	341	32
8 Surface		2.25	461	28
9 Surface		2.40	484	41
10 Surface	8.8	17.08	---	100
A	7.9	1.90	392	16
B	8.2	1.98	397	27
C	8.4	2.03	412	30
D	8.5	2.08	412	26
11 Origin		3.00	604	60
12 Origin	7.3	3.44	689	54
13 Origin		3.03	607	52
Pool	8.3	2.99	599	45

Table 3. Concentration of Heavy Metals in Water Samples of Wadi El-Raiyan ug/L (ppb).

Station/Depth	Copper Cu	Iron Fe	Lead Pb	Manganese Mn	Mercury Hg	Selenium Se	Zinc Zn
1 Surface	2.8	27	19	3.0	6.6	5.8	14
2 Surface	4.0	14	14	2.5	0.3	0.9	31
3 Surface	5.1	22	19	3.7	2.2	1.5	0.0
4 Surface	10.0	148	8	1.4	2.6	0.9	207
10 m	6.0	105	4	1.1	2.0	0.2	76
5 Surface	9.0	108	30	1.2	5.9	0.2	129
5 m	6.5	64	27	0.4	3.6	10.6	11
10m	6.0	90	25	1.2	2.8	12.6	7
6 Surface	9.3	106	30	0.0	4.5	10.8	9
2.5 m	14.0	585	28	2.7	3.6	11.0	210
7 Surface	16.0	268	53	3.6	4.0	10	216
8 Surface	7.3	99	28	2.2	4.5	8.6	26
9 Surface	12.0	209	10.0	1.6	0.2	1.4	295
10 Surface	1.7	630	10.0	6.5	2.8	8.4	107
Average	7.83	176.1	21.7	2.22	3.2	5.9	95.5
A	1.3	36	7	0.4	3.2	0.9	24
B	1.1	280	42	1.8	5.6	0.0	185
C	11.0	617	43	0.3	3.3	0.0	215
D	11.0	218	45	1.6	4.4	4.2	315
11 Origin	6.5	126	60	0.0	3.2	10.2	75
12 Origin	6.2	92	3.0	0.5	5.2	13.8	33
13 Origin	6.0	83	19	1.7	2.2	9.2	0.0
Pool	4.0	77	23	0.5	1	10.8	22
Average	5.6	94.5	11.25	0.67	2.9	11	9.2

Table 4. Concentration of Heavy Metals in Selected Plants of Wadi El-Raiyan, ug/g dry weight (ppm).

Species/Location	Copper Cu	Lead Pb	Mercury Hg	Selenium Se	Iron Fe	Zinc Zn	Manganese Mn
<u>Phragmites australis</u>							
5	9.8	30.0			830	14	16
7	10.8	32.0			273	42	22
8	12.8	47.1	78.6		330	41	51
9	11.7	33.7	29.7		320	13	33
13	5.2	41.0	28.3		302	21	61
<u>Tamarix sp.</u>							
6	5.9	39.9	74.9	2.8	686	70	12
7	3.5	23.0	39.5	1.0	612	64	4
11	3.8	27.9	29.1	9.7	920	10	7
<u>Zygophyllum album</u>							
12	3.1	30.6	4.9	29.3	1050	144	13
6	15.8	41.6	75.7	1.90	400	477	4
<u>Najas armata</u>							
A	23.1	27.5		2.90	1030	50	8

**Table 5. Concentration of Heavy Metals in Selected Planktons and Insects of Wadi El-Raiyan ug/g dry weight (ppm)**

Species/Location	Copper Cu	Lead Pb	Mercury Hg	Selenium Se	Iron Fe	Zinc Zn	Manganese Mn
<b>Plankton</b>							
2	14.8	637.0	75	33	6093	180	78.0
5	00.0	284.6	283	--	20615	1690	110.0
8	29.8	248.6			1580	537	10.3
C	164.0	1871.0		702	7777	83	40.9
<b>Insects</b>							
May Fly	37.9	186	455	353	00	35	9.2
Crickets	49.6	163		266	473	177	19.9

Table 6. Concentration of Heavy Metals in Fishs ug/g dry weight (ppm).

Species/Location,part	Copper Cu	Lead Pb	Mercury Hg	Selenium Se	Zinc Zn
<u>Tilapia zilli.</u>					
Whole body (adult)	4.2	26	16.5	55	99
intestine, Kidny, Liver	90	300	162	988	85
fins and tail	8.8	33	58	100	106
Whole body (Young)	1	10	14.5	57	49
intestine	11	105	28.2	100	40
Fins and tail	12	15	20.1	68	30

Table 7: Concentration of Heavy Metals in Mammals ug/g dry weight (ppm)

Species/part	Copper Cu	Lead Pb	Mercury Hg	Selenium Se	Iron Fe	Zinc Zn	Manganese Mn
<u>Jaculus jaculus</u>							
Whole body		37	36	2.0	524	46	4.5
liver	7.0	85		12	570	353	3.0
Kidney	30.6	187		13	1941	52	540
heart	1.7	234	47	50	400	301	4.6
intestine	26.0	67		--	1612	1250	74
Hair	39.0	360		520	0.0	.71	12.5
<u>Canis aureus</u>							
Muscles	24.4	18	65.7	0.0	695	62	1.1
Kidney	35.4	107	9.8	0.0	367	70	5.2
heart	47.0	150	--	16.0	1042	67	10.1
teeth	16.7	148	9.8	69.0	464	171	1.8



GRANT  
FRCU 842020

INVESTIGATION OF INORGANIC  
POLLUTANTS  
IN EL FAIYUM AQUATIC  
ENVIRONMENT

Principal Investigator  
Dr. Mahmoud Abbas Saleh  
Professor of Chemistry  
Faculty of Agriculture, Cairo University

Report No.  
March 1st to April 30 1985

## RESULTS

This section presents results of the detailed chemical and biological studies of samples and specimens which were collected during the third expedition. It also presents results which were either obtained by direct measurements in the field or by visual observation and photography. General features and description of studied area were shown in details in our first and second reports.

### Chemical Results:

Stations locations of the Wadi-El-Raiyan and water springs are shown in Figure 1. The concentration of some important non metallic pollutants and some physical measurements are shown in Table 1 and Table 2 respectively. Concentrations of heavy metals in water samples of Wadi El-Raiyan, are shown in Tables 3. Concentration of heavy metals in biological samples is shown in Tables 4-5.

It appears from Tables 1-3 that water salinity, hardness and amounts of total soluble salts (TSS) followed the same pattern previously shown in our first, second and third reports, but these values were lower for the second lake and the seepage areas than what was recorded during the field expeditions of July, November, and January possibly due to dilution. Water pH was very much the same throughout the lakes, being slightly basic and ranging from 7.8 to 8.8. Water

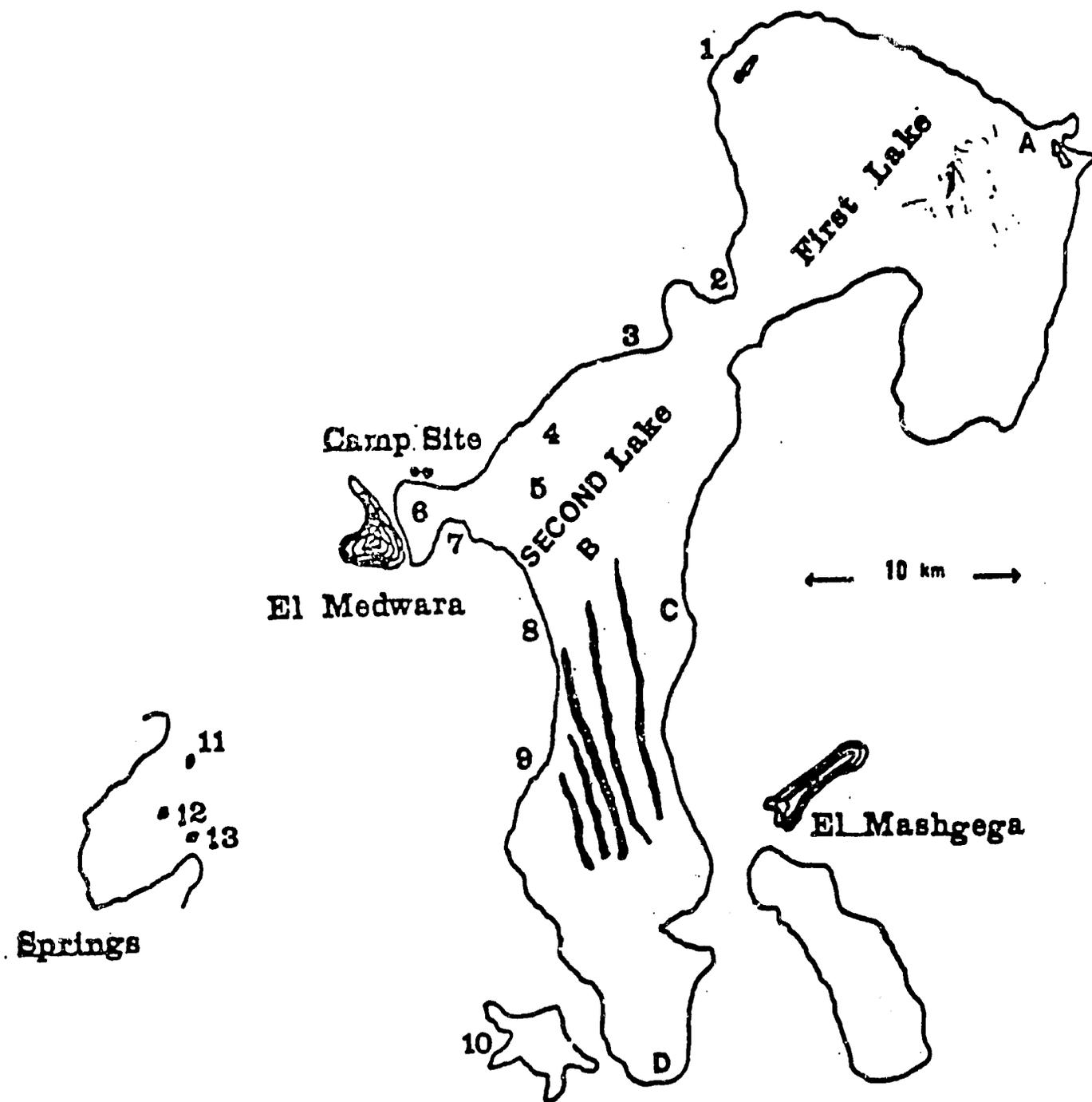


Figure 1. Map of the Selected Stations of Wadi El-Raiyan Lakes and Water Springs.

temperature was 17-25C°. Heavy metals concentrations in water was relatively lower than that recorded in the second report, and similar to what were found in the third report but below the recommended levels for general uses and also below the permissible values for public water supplies. Lead concentration ranged from 16 to 64 microgram/Liter (ppb) with an average of 36 ppb, zinc from 6 to 80 ppb with an average of 23 ppb, copper from 7 to 34 ppb with an average of 15 ppb, selenium from 0.00 to 13 ppb with an average of 3 ppb, mercury from 0.0 to 18 ppb with an average of 8 ppb, iron concentration ranged from 105 to 760 ppb with an average of 459 ppb, and manganese ranged from 8 to 80 ppb with an average of 20 ppb. No arsenic was found in any of the examined stations. Ammonium ion and free ammonia concentration in water were determined in the field and was found to be in the range of 0.00 to 0.15 ppm. Dissolved oxygen and ammonium concentration in water are suitable for fish production and may be classified as salmonoid water. Inorganic anions concentrations of nitrite, sulfide, phosphate and thiocyanate were very low, halides concentrations were moderately high, however, sulfate ion concentration was very high as shown in Table 1.

Table 1. Concentration of Nonmetallic Inorganic Ions in Water (mg/L = ppm) \*

Station/Dept	Sulfate $SO_4^{2-}$	Bisulfide $HS^-$	Nitrate $NO_3^-$	Nitrite $NO_2^-$	Ammonium $NH_4^+$	Ammonia $NH_3$	Chloride $Cl^-$	Bromide $Br^-$	Thiocyanate $SCN^-$	Phosphate $PO_4^{3-}$
1 Surface	618	0.02	87	0.005	0.8	0.62	338	0.000	0.005	0.430
2 Surface	632	0.00	84	0.005	0.05	0.04	515	0.000	0.007	0.415
3 Surface	612	0.00	84	0.002	0.1	0.08	638	0.008	0.007	0.415
4 Surface	822	0.000	78	0.000	0.05	0.04	1347	0.007	0.005	0.390
5 Surface	882	0.000	81	0.012	0.05	0.04	1311	0.000	0.005	0.380
5 m	908	0.000	74	0.005	0.1	0.08	1134	0.007	0.007	0.390
10 m	942	0.000	72	0.005	0.15	0.12	1205	0.008	0.007	0.390
6 Surface	620	0.000	74	0.002	0.05	0.04	1295	0.000	0.005	0.325
2.5 m	588	0.000	62	0.000	0.05	0.04	1205	0.006	0.004	0.340
7 Surface	1306	0.01	72	0.000	0.05	0.04	1276	0.007	0.005	0.360
8 Surface	784	0.000	65	0.002	0.05	0.04	1878	0.018	0.006	0.280
9 Surface	852	0.000	65	0.000	0.02	0.016	1205	0.021	0.006	0.290
10 (Seepage)	1428	0.000	42	0.010	0.00	0.000	12053	0.016	0.005	0.340
A Surface	322	0.000	112	0.005	0.3	0.23	177	0.000	0.003	0.445
B Surface	680	0.000	72	0.005	0.05	0.04	1205	0.006	0.005	0.340
C Surface	726	0.000	65	0.005	0.1	0.08	1559	0.007	0.005	0.365
D Surface	912	0.000	82	0.005	0.04	0.032	1447	0.000	0.006	0.265
Average Value	728	0.000	75.1	0.004	0.121	0.092	1752	0.000	0.005	0.354
11 Origin	208	0.025	0.7	0.000	0.06	0.048	1914	0.008	0.000	0.035
12 Origin	224	0.20	6.5	0.010	0.05	0.04	1772	0.006	0.000	0.055
13 Origin	196	0.020	0.8	0.000	0.0	0.0	1453	0.000	0.000	0.060
Pool	466	0.015	0.12	0.000	0.0	0.0	1453	0.006	0.000	0.045
Average value	273	0.020	8.3	0.002	0.027	0.022	1648	0.066	0.000	0.0487

\* The results are the average of three measurements, None of the cyanide or arsenite ions were detected.

Table 2. Physical Properties of Water Sample of Wadi El-Raiyan.

Station/Depth	pH	Salinity gm/L	Electric conductivity	Hardness
1 Surface	8.88	1.17		
2 Surface	8.86	1.13	243	15
3 Surface	8.50	1.74	243	18
4 Surface	8.50	2.25	355	17
5 m	8.50	2.28	462	30
5 Surface	8.59	2.22	446	31
5 m	8.50	2.18	449	33
10 m	8.56	2.27	461	32
6 Surface	8.50	2.44	502	34
2.5 m	8.50	2.46	500	32
7 Surface	8.55	2.70	496	36
8 Surface	8.17	2.72	499	32
9 Surface	8.55	2.24	485	28
10 Surface	8.80	17.65	485	41
A Surface	7.20	0.69	1844	100
B Surface	8.59	2.27	139	16
C Surface	8.60	2.05	451	27
D Surface	8.50	2.31	414	30
11 Origin	7.48	3.25	476	26
12 Origin	7.78	3.02	647	60
13 Origin	7.56	2.71	614	54
Pool	8.28	2.62	528	52
			539	45

Table 3. Concentration of Heavy Metals in Water Samples of Wadi El-Raiyan ug/L (ppb).

Station/Depth	Copper Cu	Iron Fe	Lead Pb	Manganese Mn	Mercury Hg	Selenium Se	Zinc Zn
1 Surface	10	580	20.5	17	2.2	1.4	6
2 Surface	7.5	105	14.5	8	1.2	6.4	13
3 Surface	14.5	510	36.5	15	0.0	6.4	20
4 Surface	14.5	390	39.5	20	13	6.4	23
10 m	11.5	245	53	9	11	6.4	13
5 Surface	10	460	20.5	16.5	18	0.0	10
5 m	21.5	690	57.5	16.5	3	4.6	33.5
10m	12.5	520	47.5	13	14	0.4	26
6 Surface	34	695	53	24.5	17	2.8	30
2.5 m	12.9	320	59.5	25.5	6.6	0.0	18.5
7 Surface	21	760	51	25.5	14.2	3.2	16
8 Surface	12	555	62.5	16	6.4	5.4	18.4
9 Surface	--	--	--	--	--	--	--
10 Surface	18	224	14.5	38	9.8	4.8	13.5
A Surface	1.3	36	14.5	4	15	3	13
B Surface	9.4	455	53.5	19.6	11	9.4	19
C Surface	12.5	390	46	18.5	1.4	0.0	13
D Surface	19.5	560	64.5	18	8	3	34
Average	15.3	461	39.9	17.6	8.8	3.5	18.9
11 origin	11	60	48.5	28.5	11	0.5	20
12 Origin	16.5	475	45	25.5	21	0.0	73.5
13 Origin	5	30	22	22	14.6	2.8	2.5
Pool	11.6	930	66.5	24.4	15	5.5	22.5
Average	11.02	264.1	45.5	25.1	15.4	2.2	24

Table 4. Concentration of Heavy Metals in Selected Plants and Birds of Wadi El-Raiyan, ug/g dry weight (ppm).

Species/Location	Copper Cu	Lead Pb	Mercury Hg	Selemium Se	Zinc Zn	Manganese Mn
<u>Phragmites australis</u>	6.3	9.7	21.3	10.6	12.7	39
<u>Tamarix sp.</u>	11.4	9.4	56.1	18.7	22.0	42
<u>Motacilla alba</u>	23.4	20.4	126.7	6.4	19.6	28
meat	30.5	21.5	149.2	9.8	44.5	84
kidney	25.6	29.7	44.6	19.3	18.7	47
liver	11.7	5.3	12.4	11.4	26.6	3.9
heart	155.5	50.5	94.7	198.9	71.8	23.7
feathers	20.6	6.7	59.9	19.9	73.2	7.5
bones	45.7	37.1	113.4	54.8	55.6	32.1
<u>Bubulcus ibis</u>	7.7	59.3	106.8	19.6	26.6	8.0
whale booly	6.4	39.1	27.6	55.1	64.0	11.9
meat	9.4	36.6	92.3	20.3	53.7	16.5
feathers	26.1	27.5	22.4	3.8	16.0	6.2
benes	158.9	179.5	846.15	20.0	123.0	0.00
	9.4	65.5	196.6	30.6	80.8	13.4

**Table 5. Concentration of Heavy Metals in Fishs ug/g dry weight (ppm).**

Species/Location, part	Copper Cu	Lead Pb	Mercury Hg	Selenium Se	Zinc Zn
<u>Tilapia zilli.</u>					
Whole body (one year old)	2.5	15.9	19.1	20.0	60
intestine,kidny,Liver	20.2	25.8	103.4	36.2	68
fins and tail	27.0	26.1	117.2	39.0	108
whole body(two years old)	4.1	12.7	18.9	25.6	43
intestine	191.4	28.9	56.0	56.0	63
Fins and tail	26.9	22.9	88.6	41.8	97
whale body(three years old)	6.8	20.0	58.3	18.3	26.6
Intestine, Kindny.Liver	15.3	19.3	75.2	15.2	52.3
Fins and tail	9.0	34.1	119.2	19.2	57.7
whole body	11.7	15.8	20.8	14.7	22.7
Intestine,kidny,liver	12.11	23.2	32.0	18.0	61.1
Fins and tail	4.4	29.9	48.0	20.0	72.8

APPENDIX C

Instrumentation Requirements  
and Specifications

SPECIFICATIONS FOR A  
FIELD TEST INSTRUMENTATION SYSTEM

The Renewable Energy Field Test instrumentation system will be used to monitor IPH, PV and wind energy system installations at urban and remote desert locations in Egypt. These energy systems include main power sources (solar collectors, PV arrays and wind turbines) as well as ancillary subsystems depending on specific field test applications. These subsystems include ice-making equipment, desalination systems, a variety of load characteristics ranging from small DC loads to grid-connected applications and back-up power systems (diesel engines and batteries).

The instrumentation system must be a stand-alone system. Failure of the instrumentation system must not affect the performance of the field test system that is being monitored. The instrumentation system must have an on-site data storage system that is non-volatile and capable of easy physical removal and transport to another location for data removal and long-term storage. One form of the non-volatile storage system must be a microchip/ EPROM or CMOSRAM - Type system that can be "milked" on site easily and without danger of a loss of data.

The instrumentation system must be a microcomputer based data logger with programmable input channels and output formats both analog and digital. The user must have control over sampling frequency and output period for each channel. The capability to multiplex some of the channels is also required. Primary design objectives for the instrumentation system should be reliability, simplicity, small size, low power and the ability to operate in environmental extremes as specified (especially high temperature, sand/dust and tropical/sea coast). The unit must be capable of stand-alone battery operation for a period of at least one month, preferably for two months.

The following minimum specifications are required for the instrumentation system. If an exception must be taken to one or more of these requirements,

the exception shall be noted and a clear explanation given as to why the bidder believes that the exception should be acceptable to the purchaser.

#### Physical Specifications

- o Small, stand-alone, self-contained system in an environmental enclosure
- o Desired weight: less than 10 pounds
- o Desired size: less than 10 inches x 10 inches x 6 inches

#### System Power Requirements

- o Capable of operation using self-contained batteries
- o Capability for the use of an external power source to allow continued data collection while changing batteries is desirable.
- o Capable of transient protection from spurious electrical charges or lightning.

#### Environmental Specifications

- o Ambient Temperature: -25 deg. C to +50 deg. C
- o Relative Humidity: 0 to 90 percent non-condensing
- o Impervious to a tropical, oceanside environment with occasional high airborne sand/dust and/or sulphur levels

#### Analog Inputs

Number of Channels: At least 12 channels

Voltage Measurement Types: Differential or single-ended

Accuracy of Measurements: at least  $\pm 0.5$  percent

Range and Resolution: Selectable for any input channel from microvolts to several volts full scale

Sample Rates: At least once per second for each channel

Multiplex Capability: at least four channels

#### Pulse Inputs

Number of Pulse Counter Channels: at least 4 channels

Analog and Digital Control Outputs: a total of three resettable channels each is desired with a range of 0 to  $\pm 5$  volts with a 0.5 volt resolution

Multiplex Capability: at least three channels

## Output Signal Interface

Memory: Capable of storing at least 3000 data points per day for a period of one month (two months desirable)

Display: A visual display of stored data is required on-site for data verification before data removal

Peripheral Interface: Downloading of data at the site should be by physical removal of the data storage device or simple, reliable data downloading to a non-volatile storage device. Storage data files shall be IBM-PC compatible on floppy disc either directly from the data logger or through a simple, fast, reformatting technique.

## FIELD TEST PERFORMANCE MONITORING DATA REQUIREMENTS

### Field Test #6 (PV ice-making)

<u>Parameter</u>	<u>Channel Type</u>	<u>Output Interval</u>
* Array Power (kW)	P	10 min.
Array Voltage (volts)	A	10 min.
Array Current (Amps)	A	10 min.
PV ref. cell temp. (2 or 3) (°C)	A	10 min.
Diesel Fuel Usage (Liters)	A	Daily
* Diesel Power (kW)	P	10 min.
Diesel Number of on-off Cycles	P	Daily
Diesel Voltage (volts)	A	10 min.
Diesel Current (Amps)	A	10 min.
Battery Charge and Discharge Current (Amps)	A	10 min.
Battery Voltage (volts)	A	10 min.
Battery Temp. (°C)	A	10 min.
Ice Maker Water Flow (Liters)	P	10 min.
Water Inlet Temp. (°C)	A	30 min.
* Ice Maker Power (kW)	P	10 min.
Ice Maker Voltage (volts)	A	10 min.
Ice Maker Current (Amps)	A	10 min.

\* Desired but not required.

### Meteorological Station

<u>Parameter</u>	<u>Channel Type</u>	<u>Output Interval</u>
Horizontal Insolation (kW/m <sup>2</sup> )	A	10 min.
Plane of Array Insolation (if appropriate) (kW/m <sup>2</sup> )	A	10 min.
Ambient Temp. (°C)	A	30 min.
Humidity (%)	A	30 min.
Air Pressure (kgm/m <sup>2</sup> )	A	30 min.
Wind Speed (m/sec)	A	10 min.
Wind Direction (degrees)	A	10 min.

APPENDIX D

PARTS LIST SCHEDULE

---

TECHNICAL SPECIFICATION DATA SCHEDULES

---

Solar Cell Modules

General

- Type \_\_\_\_\_
- Model \_\_\_\_\_
- Total area of the photovoltaic modules or panels mxm \_\_\_\_\_
- Total number of modules or panels \_\_\_\_\_
- Number of modules connected in series or parallel in the single array \_\_\_\_\_
- Number of arrays connected in parallel or series in the whole system \_\_\_\_\_
- Type of wiring connections between modules and arrays state conductor and insulator materials (overall connection diagram should be attached) \_\_\_\_\_
- Range of inclination, tilt angle to horizontal \_\_\_\_\_
- Overall efficiency of the total Solar cell module arrays (based on gross frontal area or state other conditions) \_\_\_\_\_
- Standard operating conditions (based on 1000 w/m<sup>2</sup>) insolation and 28°C cell temperature or state other conditions \_\_\_\_\_

Solar Cell Module or Panel

- Total dimensions of each module or panel length X width X depth maximum \_\_\_\_\_
- Front surface area \_\_\_\_\_
- Weight per each module kg. \_\_\_\_\_
- Area of each cell and shape (gross frontal area and effective area excluding conductors area) \_\_\_\_\_
- Material of cells \_\_\_\_\_
- Configuration or connections between cells (series parallel - series/parallel and number) \_\_\_\_\_

Solar Cell Module or Panel (Continued)

- Is there any dual leads? (redundant connections) \_\_\_\_\_
- Intermediate taps \_\_\_\_\_
- Maximum power, watts peak \_\_\_\_\_
- Maximum voltage, volts peak \_\_\_\_\_
- Maximum current, Amperes peak \_\_\_\_\_
- Open circuit voltage, v.o.c. \_\_\_\_\_
- Short circuit current, Is.c. \_\_\_\_\_
- Series resistance per cell  $R_s$ /cell \_\_\_\_\_
- $V$ , temperature coefficient \_\_\_\_\_
- $I$ , temperature coefficient \_\_\_\_\_
- $R$ , temperature coefficient \_\_\_\_\_
- $P$ , temperature coefficient \_\_\_\_\_
- Temp. cell-temp. air \_\_\_\_\_
- Failure rate \_\_\_\_\_
- Protection \_\_\_\_\_
- Fill factor, the ratio between the maximum power output to the product of open circuit voltage and short circuit current \_\_\_\_\_
- Maximum permissible wind load \_\_\_\_\_
- Maximum permissible snow and sand load \_\_\_\_\_
- Maximum permissible impact \_\_\_\_\_

N.B.

Various curves describing cell characteristics should be attached i.e., Is.c. versus Vo.c and P, etc.

Cover

Material \_\_\_\_\_

- Quality and chemical analysis, behaviours with  
ultra-violet rays in case of plastic cover \_\_\_\_\_

- Transmissivity factor \_\_\_\_\_

- Absorbtion factor \_\_\_\_\_

- Reflection factor \_\_\_\_\_

Casing or Encapsulation

- Type \_\_\_\_\_

- Material \_\_\_\_\_

- Thickness \_\_\_\_\_

Frame and Supports

- Material \_\_\_\_\_

- Weather proofing treatement \_\_\_\_\_

- Maximum permissible mechanical stresses \_\_\_\_\_

- Range of tilt adjustment (if any) and number  
of steps \_\_\_\_\_

- Profiles and dimensions \_\_\_\_\_

- Weight per unit or array \_\_\_\_\_

- Method of fixation \_\_\_\_\_

Battery

- Manufacturer, Country \_\_\_\_\_

- Type, Lead acid or alkaline nickel-cadmium, etc. \_\_\_\_\_

- Efficiency \_\_\_\_\_

Battery (Continued)

- Charging -----
  - Max Volt -----
  - Max Current -----
  
- Overcharging -----
  - Max Volt -----
  - Max Current -----
  
- Output -----
  - at 8 hr rate -----
  - at 20 hr rate -----
  - at 7 hr rate -----
  - at 3 week rate -----
  
  - kWh -----
  
  - lh -----
  
  - volts -----
  
  - Max current -----
  
  - Self discharge -----
  
  - Dimensions -----
  
  - Weight -----
  
  - Temp. limits -----
  
  - 0% Charge -----
  
  - 50% Charge -----
  
  - 100% Charge -----
  
  - Total number connected in series/parallel -----
  
  - Overall output voltage -----
  
  - Overall max. current -----
  
  - Protection supplied -----

Battery (Continued)

- Lifecycles at different depths of discharging:

10% depth	-----
20% depth	-----
50% depth	-----
80% depth	-----
100% depth	-----

DC Regulators

- Manufacturer, Country -----

- Model' -----

- Efficiency -----

- Input:

Volts	-----
Amps	-----
Protection	-----

- Output:

Waveform	-----
Volts	-----
Amps	-----
Protection	-----

- Dimension -----

- Weight (kg) -----

- Temp. Limits -----

- Cooling -----

Inverter (if any)

- Manufacturer, Country -----

- Type -----

- Rated output power -----

- Rated output current -----

Inverter (Continued)

- Output Voltage -----
- Output Frequency:
  - minimum/maximum -----
  - Standard Frequency range -----
- Rated input voltage:
  - minimum/maximum -----
- Efficiency in the rated point -----
- Environmental temperature -----
- Type of cooling -----
- Type of protection -----
- Dimensions -----
- Weight -----

Schedule No. D-1  
NAMES OF MANUFACTURERS, PLACES OF MANUFACTURE,  
DATES OF INSPECTION & DELIVERY TIMES  
(To be filled and signed by Tenderer)

<u>Item</u>	<u>Name of Manuf.</u>	<u>Adrs. &amp; Tel. Manuf.</u>	<u>Time within which matl ready for insp. &amp; test</u>	<u>Deliv. Times in month</u>
1. Ice Making & Handling Eqpt.				
2. Ice Storage building				
3. Photovoltaic Array				
4. Diesel/Generator set				
5. Battery Storage System				
6. Power Control & Cond. System				
7. Fishing Shelter Power System (lights, small radio, small refrigerator)				
8. Area Lighting (a single street light type) for boat handling				
9. Water Supply Eqpt.				
10. Waster Treatment System (if required)				
11. Required Operating, Maintenance, Repair tools, Meters, etc.				
12. Eqpt. for making ice blocks from daily production of plate or flake ice				

Schedule No. D-1 (Cont'd)

13. An on-site data acquisition system for performance monitoring
14. Required spare parts
15. Support Structure
16. Ice Crusher

Signature of  
Manufacturer \_\_\_\_\_

## SECTION D - PACKAGING AND MARKING

### D.1 Packaging

All materials and equipment must be properly prepared for export to withstand exposure to the elements and rough handling during ocean shipment. Such packing must be sufficient to insure safe arrival at destination and fully cover such hazards as extreme temperature and/or possible corrosion due to salt air or open storage.

### D.2 Marking

D.2.1 The supplier shall be responsible for assuring that all commodities, including machinery, equipment, and materials to be furnished under this Request for Proposal (RFP) and their shipping containers, will carry the official USAID emblem(s). Suppliers will be responsible for correctly marking goods and shipping containers. Emblem shall be affixed by metal plate, decal, stencil, label, tag, or other means depending upon the type of commodity or shipping container and the nature of the surface to be marked.

Further the container must be shipped to the Port of Alexandria, Egypt and marked with the following exact wording:

FOR THE ENERGY FIELD TESTING PROJECT  
USAID PROJECT NO. 263-0123  
PRESIDENTIAL DECREE NO. 576 YEAR/82  
C/O EGYPTIAN ELECTRICITY AUTHORITY/EREDO  
ATTN: DR. TALAAT EL TABLAWI, MANAGING DIRECTOR/EREDO

on the mailing label and the consignment block of the shipping document/waybill.

D.2.2 The emblem placed on the commodities shall be as durable as the trademark, company or brand name affixed by the manufacturer and the emblem on each shipping container must be affixed in a manner which assures that it will remain legible until the container reaches its destination. Such containers shall display the last set of digits of the identification number of the pertinent implementing document in characters equal in height to the shipper's marks.

D.2.3 Detailed marking instructions and emblem samples may be obtained from the Office of Small & Disadvantaged Business Utilization/ Minority Resources Center, AID/W, Washington, D.C. 20523.

D.2.4 The Contractor must send to the Egyptian Electricity Authority/EREDO a complete description of the equipment including: Port of Shipment, Port of Destination, Consigner, Consignee, Gross Weight, Net Weight, physical description of the items as well as their purpose, the manufacturer's catalogue and part number, Shipping Document/Waybill Number, and estimated time of arrival in Egypt 30 days prior to arrival of equipment in Egypt.

D.2.5 Spare Parts. The successful supplier shall ship all spare parts, as indicated in the specifications, at the same time the primary equipment is shipped, and in no case later than the latest-shipped equipment.

SECTION E - INSPECTION AND ACCEPTANCE

52.252-2 CLAUSES INCORPORATED BY REFERENCE (APR 1984)

The contract incorporates the following clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available.

NOTE: Actual contract clauses selected will be dependent on type of business, business size, dollar threshold, and other factors.

1. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1) CLAUSES

52.246-2 Inspection of Supplies--Fixed-Price (JUL 1985)

52.246-4 Inspection of Services--Fixed-Price (APR 1984)

52.246-12 Inspection of Construction (APR 1984)

52.246-15 Certificate of Conformance (APR 1984)

52.246-16 Responsibility for Supplies (APR 1984)

## SECTION F - DELIVERIES OR PERFORMANCE

### F.1 Period of Performance

The effective date of this contract is \_\_\_\_\_. The expiration date of this contract is \_\_\_\_\_. All work and services required hereunder including preparation, submission, review, and acceptance of all supplies, services, and reports shall be completed prior to the expiration date of this contract.

### F.2 Supplies

See Section C. Statement of Work.

### F.3 Training

See Section C. Statement of Work, specifically Subsections 6.0-6.3.

### F.4 No. of Copies and Delivery of Reports

- F.4.1 Quarterly Reports. The Contractor shall deliver to the USAID Project Officer, seven (7) copies of each Quarterly Report for distribution as follows to the: USAID Project Officer for his reference, Director-Egyptian Renewable Energy Development Organization, USAID Mission Project Files, Host Organization Site Representative, Egyptian Renewable Energy Field Testing (EREFT) Project Library, EREFT Project Manager for the files, and EREFT Responsible Subcontractor. The Quarterly Reports will cover performance and problems and make appropriate recommendations for their resolution. Formal acceptance by the USAID Project Officer will be made in writing no later than 45 days after delivery of each report.
- F.4.2 Design Report. The Contractor shall deliver to the USAID Project Officer, seven (7) copies of the Design Report stating the precise design details of the system for distribution as noted in F.4.1 above. Formal acceptance by the USAID Project Officer will be made in writing no later than 45 days after the delivery of the Design Report.
- F.4.3 Operations and Maintenance (O&M) Manual. See Section C, specifically Subsections 8.0-8.6. The Contractor will submit to the USAID Project Officer, seven (7) copies of the O&M Manual to be distributed as noted in F.4.1, above. Formal acceptance by the USAID Project Officer will be made in writing no later than 45 days after delivery.
- F.4.4 Spare Parts Manual. The Contractor shall furnish a Spare Parts Manual with part number designations and a photograph of spare parts and components necessary for proper and continuing functioning of each unit for a period of two years after the termination of the Contractor's contract. The manual will identify spare parts and components by manufacturer codes and part numbers, quantities to be kept on hand, nomenclature, and unit assembly locations by system drawings. Seven (7)

copies of the Spare Parts Manual shall be delivered to the USAID Project Officer for distribution as noted in F.4.1, above. Formal acceptance by the USAID Project Officer will be made in writing no later than 45 days after delivery.

**F.4.5 Drawings.** In addition to drawings previously specified in the Statement of Work, the following shall be included:

- Schematic diagrams of individual major components, printed wiring boards, and the completed equipment;
- Logic diagrams;
- Interconnection diagrams;
- Cabling diagrams;
- Wiring diagrams; and
- Dimensional drawings of all important components with material specifications.

Six (6) copies of the drawings shall be delivered by the Contractor to the USAID Project Officer for distribution as follows: USAID Project Officer for his reference, Managing Director-Egyptian Renewable Energy Development Organization/EREDO, EREFT Project Library, Host Organization Site Representative, EREFT Project Project Manager for the Files, and EREFT Responsible Subcontractor. Drawings shall be delivered not later than 30 days after the completion of the 30 day acceptance testing period of the equipment.

**F.4.6 Summary Report.** Eleven (11) copies of the Summary Report for installation, testing, and turnover shall be delivered by the Contractor within 90 days of completion of services under this contract to the USAID Project Officer for distribution in lieu of distribution requirements spelled out in AIDAR CLAUSE 752.7026 as follows: 1- USAID Project Officer for his reference, 1-USAID Mission Project Files, 1-USAID Mission Contracting Officer, 3-PPC/DIU-AID (This includes 1 copy for the USAID Library in Washington, D.C.), Managing Director-Egyptian Renewable Energy Development Organization/EREDO, EREFT Project Library, Host Organization Site Representative, EREFT Project Manager for the Files, and EREFT Responsible Subcontractor. Formal acceptance by the USAID Project Officer will be made in writing no later than 45 days after delivery of the report.

**F.4.7 Final Report.** Eleven (11) copies of the Final Report covering the two year warranty period shall be delivered by the Contractor 90 days before completion of the contract to the USAID Project Officer for distribution in lieu of distribution requirements spelled out in AIDAR CLAUSE 752.7026 as noted in F.4.5 above. Formal acceptance by the USAID Project Officer will be made in writing no later than 60 days after delivery of the report (or 30 days before the completion of the contract).

F.5 Place of Delivery

Item F.2, Supplies, shall be delivered to the Port of Alexandria, Egypt, cleared through customs, trucked to the site, and assembled at the site by the Contractor as noted in the Statement of Work.

Item F.3, Training, shall be delivered by the Contractor at the site noted in the Statement of Work and at the various manufacturing facilities of the equipment manufacturer by either the manufacturer or Contractor.

Items F.4.1, Quarterly Reports; F.4.2, Operations and Maintenance Manual; F.4.3, Spare Parts Manual; F.4.4, Drawings; F.4.5, Summary Report; and F.4.6, Final Report, shall be delivered to the USAID Project Officer for delivery as noted above under Section F.4.

F.6 Key Personnel

The personnel listed below are examples of positions that may be required under the contract. USAID solicits suggestions from the Proposer for key personnel and their job descriptions.

F.6.1 The key personnel which the Contractor shall furnish for the performance of this contract shall have the following qualifications:

- Engineer - DESCRIPTION
- Mechanic/Service man -

Will supervise the assembly of the system as defined in the Statement of Work and perform the initial start-up and ensure that the equipment will be completely adjusted, lubricated, and made ready for continuous operation.

F.6.2 The estimated composition of the total work-months of effort is as follows:

<u>Titles</u>	<u>No. of Work-Months</u>
---------------	---------------------------

TOTAL

F.7 Schedule of Work

All tasks set forth in the Statement of Work will be performed in accordance with the terms and conditions of the Contract and performance will begin on the date noted in Section F.1.

F.8 Stop Work Order

FAR 52.212-13 Stop Work Order (APR 1984)  
(Deviation)

The Contracting Officer may at any time, by written order to the Contractor, require the Contractor to stop all, or any part of the work called for by this contract for a period of 30 days after the order is delivered to the Contractor, and for any further period to which the parties may agree. The order shall be specifically identified as a stop-work order issued under this clause. Upon receipt of the order, the Contractor shall immediately comply with its terms and take all reasonable steps to minimize the incurrence of costs allocable to the work covered by the order during the period of work stoppage. Within a period of 30 days after the stop work order is delivered to the Contractor, or within any extension of that period to which the parties shall have agreed, the Contracting Officer shall either:

(NOTE: remainder of this clause is unchanged. Deviations are underlined parts of paragraph immediately above.)

F.9 U.S. Government Delay of Work

FAR 52.212-15 Government Delay of Work (APR 1984)

- (a) If the performance of all or any part of the work of this contract is delayed or interrupted (1) by an act of the Contracting Officer in the administration of this contract that is not expressly or impliedly authorized by this contract, or (2) by a failure of the Contracting Officer to act within the time specified in this contract, or within a reasonable time if not specified, an adjustment (excluding profit) shall be made for any increase in cost of performance of this contract caused by the delay or interruption and the contract shall be modified in writing accordingly. Adjustment shall also be made in the delivery or performance dates and any other contractual term or condition affected by the delay or interruption. However, no adjustment shall be made under this clause for any delay or interruption to the extent that performance would have been delayed or interrupted by any other cause, including the fault or negligence of the Contractor, or for which an adjustment is provided or excluded under any other term or condition of this contract.
- (b) A claim under this clause shall not be allowed (1) for any costs incurred more than 20 days before the Contractor shall have notified the Contracting Officer in writing of the act or failure to act involved, and (2) unless the claim, in an amount stated, is asserted in writing as soon as practicable after the termination of the delay or interruption, but not later than the day of final payment under the contract.

## SECTION G - CONTRACT ADMINISTRATION DATA

### G.1 Project Officer

The cognizant USAID Project Officer is designated by the Officer Director of Science and Technology/HRDC.

### G.2 Payment Administrator

The so-designated USAID Project Officer will perform all contract administration functions for the resultant contract that are not specifically retained by the Contracting Officer. The specific administration functions retained by the Contracting Officer are identified and explained in various contract clauses throughout the contract.

### G.3 Fiscal Data

The funds for this contract are available as follows:

Contract No.:  
PIO/T No.:  
Appropriation No.:  
Budget Plan Code:  
Contract Period:  
Total Estimated Cost:  
Amount Obligated:  
Contract Office:  
Project Office: HRDC/S&T, USAID/Egypt  
Paying Office: Controller, USAID/Egypt

### G.4 Approvals AIDAR 752.7025 (APR 1984)

All approvals required to be given under the contract by the Contracting Officer or the Mission Director shall be in writing and except when extraordinary circumstances make it impracticable, shall be requested by the Contractor sufficiently in advance of the contemplated action to permit approval, disapproval or other disposition prior to that action. If, because of existing conditions, it is impossible to obtain prior written approval, the approving official may, at his discretion, ratify the action after the fact.

### G.5 Authority to Bind the Government

The Contracting Officer is the only individual who may legally commit the Government to the expenditure of public funds. No cost chargeable to the proposed agreement may be incurred prior to receipt of either a fully executed contract, or a specific, written authorization from the Contracting Officer.

G.6 Logistical Support to the Contractor

The following items of logistic support will be provided, without charge to this contract:

<u>Description</u>	<u>Provided By</u>
Office Space	EREFT Project
Check Cashing Privilege at Accommodation Exchange	USAID
Customs Clearance Assistance	Egypt Electricity Authority/EREDO
Permitting	Egypt Electricity Authority/EREDO

G.7 Method of Payment

Requests for payment to the Contractor shall be submitted on USAID Form SF1034 at intervals no shorter than thirty (30) days each, to addressee in Block 12 of the Cover Page.

## SECTION H - SPECIAL CONTRACT REQUIREMENTS

### H.1 Defense Base Act (DBA) Insurance

Pursuant to CLAUSES far 52.228-03 and AIDAR 752.228-70, the Insurance Carrier currently under contract with USAID to provide DBA insurance is Insurance Company of North America, c/o Wright & Co., 1400 Eye Street, N.W., Suite 1100, Washington, D.C. 20005; telephone (202) 289-0200 or (800) 424-9301 (toll free) outside the Washington area; and telex number 440508.

### H.2 Special Provisions

- a. Security Performance. The contractor shall not have access to classified information or administratively-controlled information.
- b. Source/Origin of Goods and Services. Source and origin for all goods and services funded by USAID shall be the Cooperating Country and countries included in USAID Geographic Code 000.

### H.3 Technical Directions

Performance of the work hereunder shall be subject of the technical directions of the cognizant USAID Project Officer. As used herein, "Technical Directions" must be within the terms of this contract, shall not change or modify them in any way, and shall not constitute changes within the meaning of the contract clause entitled "Changes-Cost Reimbursement". The Contractor shall notify the Contracting Officer in writing of any Technical Directions which he considers to constitute changes prior to performing such changes.

### H.4 Rights in Data

- a. The term "Subject Data" as used herein includes writings, sound recordings, pictorial reproductions, drawings or other graphical representations, and works of any similar nature (whether or not copyrighted) which are specified to be delivered under this contract. The term does not include financial reports, cost analyses, and other information incidental to contract administration.
- b. All Subject Data first produced in the performance of this contract shall be the sole property of the Government. The Contractor agrees not to assert any rights as common law or equity and not to establish any claim to statutory copyright in such Data. The Contractor shall not publish or reproduce such Data in whole or in part or in any manner or form, nor authorize others to do so, without the written consent of the Government.
- c. The Contractor agrees to grant and does hereby grant to the Government and to its officers, agents, and employees acting within the scope of their official duties, a royalty-free, nonexclusive, and irrevocable license throughout the world (i) to publish, translate, reproduce, deliver, perform, use, and dispose of, in any manner, any

and all Data not first produced or composed in the performance of this contract but which is incorporated in the work furnished under this contract; and (ii) to authorize others to do so.

- d. The Contractor shall indemnify and save and hold harmless the Government, its officers, agents, and employees acting within the scope of their official duties against any liability including costs and expenses (i) for violation of proprietary rights, copyright, or right of privacy, arising out of the publication, translation, reproduction, delivery, performance, use or disposition of any Data furnished under this contract; or (ii) based upon any libelous or other unlawful matter contained in such Data.
- e. Nothing contained in this clause shall imply a license to the Government under any patent or be construed as affecting the scope of any license or other right otherwise granted to the Government under any patent.
- f. Paragraphs (c) and (d) of this section are not applicable to material furnished to the Contractor by the Government and incorporated in the work furnished under the contract; provided, such incorporated material is identified by the Contractor at the delivery of such work.

#### H.5 Time Extensions

FAR 52.212-6 Time Extensions (APR 1984)

Notwithstanding any other provisions of this contract, it is mutually understood that the time extensions for changes in the work will depend upon the extent, if any, by which the changes cause delay in the completion of the various elements of construction. The change order granting the time extension may provide that the contract completion date will be extended only for those specific elements so delayed and that the remaining contract completion dates for all other portions of the work will not be altered and may further provide for an equitable readjustment of liquidated damages under the new completion schedule.

#### H.6 Performance Bond or Guaranty

The Contractor shall furnish to USAID within 15 days after award, a Performance and Payment Bond or Performance Guaranty fully protecting USAID against any excess costs incurred by it as a result of any failure of the Contractor to perform any of the obligations under this contract.

Such Bonds or Guaranty shall be satisfactory to USAID and, at the option of the Contractor, shall be in the form of a surety bond, certified check, cashier's check, bank guaranty, or irrevocable letter of credit. If a performance guaranty in the form of a certified check, cashier's check, bank guaranty or irrevocable letter of credit is used, it shall be in an amount equivalent to ten (10) percent of the total amount of the contract value. If a Performance Bond is used, the bond shall be in the amount equivalent to one hundred (100) percent of the total amount of the contract value. The Performance Guaranty shall be drawn in favor of USAID and shall be collectible upon receipt of USAID's written certification and verification of Contractor's default hereunder.

The Bonds or Guaranty shall be released not later than 30 days following the date of completion of the contract performance.

## H.7 Warranty

FAR 52.246-19-I & III Warranty of Systems and Equipment under Performance Specifications or Design Criteria (APR 1984)

### (a) Definitions.

"Acceptance," as used in this clause, means the act of an authorized representative of the Government by which the Government assumes for itself, or as an agent of another, ownership of existing and identified supplies, or approves specific services rendered, as partial or complete performance of the contract.

"Correction," as used in this clause, means the elimination of a defect.

"Defect," as used in this clause, means any condition or characteristic in any supplies or services furnished by the Contractor under the contract that is not in compliance with the requirements of the contract.

"Supplies," as used in this clause, means the end items furnished by the Contractor and related services required under this contract. Except when this contract includes the clause entitled Warranty of Data, supplies also means "data."

### (b) Contractor's obligations.

- (1) The Contractor's warranties under this clause shall apply only to those defects discovered by either the Government or the Contractor within 45 days after delivery.
- (2) If the Contractor becomes aware at any time before acceptance by the Government (whether before or after tender to the Government) that a defect exists in any supplies or services, the Contractor shall (i) promptly correct the defect or (ii) promptly notify the Contracting Officer, in writing, of the defect, using the same procedures prescribed in paragraph (b)(3) of this clause.
- (3) If the Contracting Officer determines that a defect exists in any of the supplies or services, the Contracting Officer shall promptly notify the Contractor of the defect, in writing, within 90 days after discovery of the defect. Upon timely notification of the existence of a defect, or if the Contractor independently discovers a defect in accepted supplies or services, the Contractor shall submit to the Contracting Officer, in writing, within 14 days a recommendation for corrective actions, together with supporting information in sufficient detail for the Contracting Officer to determine what corrective action, if any, shall be undertaken.

- (4) The Contractor shall promptly comply with any timely written direction from the Contracting Officer to correct or partially correct a defect, at no increase in the contract price.
- (5) The Contractor shall also prepare and furnish to the Contracting Officer data and reports applicable to any correction required under this clause (including revision and updating of all other affected data called for under this contract) at no increase in the contract price.
- (6) In the event of timely notice of a decision not to correct or only to partially correct, the Contractor shall submit a technical and cost proposal within 14 days to amend the contract to permit acceptance of the affected supplies or services in accordance with the revised requirement, and an equitable reduction in the contract price shall promptly be negotiated by the parties and be reflected in a supplemental agreement to this contract.
- (7) Any supplies or parts thereof corrected or furnished in replacement and any services reperformed shall also be subject to conditions of this clause to the same extent as supplies or services initially accepted. The warranty, with respect to these supplies, parts, or services, shall be equal in duration to that set forth in paragraph (b)(1) of this clause, and shall run from the date of delivery of the corrected or replaced supplies.
- (8) The Contractor shall not be responsible under this clause for the correction of defects in Government-furnished property, except for defects in installation, unless the Contractor performs, or is obligated to perform, any modifications or other work on such property. In that event, the Contractor shall be responsible for correction of defects that result from the modifications or other work.
- (9) If correction or replacement is required, and transportation of supplies in connection with correction or replacement is necessary, transportation charges and responsibility for the supplies while in transit shall be borne by the Government.
- (10) All implied warranties of merchantability and "fitness for a particular purpose" are excluded from any obligation under this contract.

(c) Remedies available to the Government.

- (1) The rights and remedies of the Government provided in this clause-- (i) Shall not be affected in any way by any terms or conditions of this contract concerning the conclusiveness of inspection and acceptance; and (ii) Are in addition to, and do not limit, any rights afforded to the Government by any other clause of this contract.

- (2) Within 30 days after receipt of the Contractor's recommendations for corrective action and adequate supporting information, the Contracting Officer, using sole discretion, shall give the Contractor written notice not to correct any defect, or to correct or partially correct any defect within a reasonable time at the most practical location.
- (3) In no event shall the Government be responsible for any extension or delays in the scheduled deliveries or periods of performance under this contract as a result of the Contractor's obligations to correct defects, nor shall there be any adjustment of the delivery schedule or period of performance as a result of the correction of defects unless provided by a supplemental agreement with adequate considerations.
- (4) This clause shall not be construed as obligating the Government to increase the contract price.
- (5) (i) The Contracting Officer shall give the Contractor a written notice as required in paragraph (c)(1)(ii) below, specifying any failure or refusal of the Contractor to--
  - (A) Present a detailed recommendation for corrective action as required by paragraph (b)(3) of this clause;
  - (B) Correct defects as directed under paragraph (b)(4) of this clause; or
  - (C) Prepare and furnish data and reports as required by paragraph (b)(5) of this clause.(ii) The notice shall specify a period of time following receipt of the notice by the Contractor in which the Contractor must remedy the failure or refusal specified in the notice.
- (6) If the Contractor does not comply with the Contracting Officer's written notice in paragraph (c)(5)(i) of this clause, the Contracting Officer may by contract or otherwise--
  - (i) Obtain detailed recommendations for corrective action and either--
    - (A) Correct the supplies or services; or
    - (B) Replace the supplies or services, and if the Contractor fails to furnish timely disposition instructions, the Contracting Officer may dispose of the nonconforming supplies for the Contractor's account in a reasonable manner, in which case the Government is entitled to reimbursement from the Contractor, or from the proceeds, for the reasonable expenses of care and disposition, as well as for excess costs incurred or to be incurred;
  - (ii) Obtain applicable data and reports; and
  - (iii) Charge the Contractor for the costs incurred by the Government.
- (7) The Contractor shall be liable for the reasonable costs of disassembly and/or reassembly of larger items when it is necessary to remove the supplies to be inspected and/or returned for correction or replacement.

SECTION I. 52.252-02 CLAUSES INCORPORATED BY REFERENCE (APR 1984)

The contract incorporates the following clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available.

I. FEDERAL ACQUISITION REGULATION (48 CFR Chapter 1) CLAUSES

- 52.202-01 Definitions (ALT I) (APR 1984)
- 52.203-01 Officials Not to Benefit (APR 1984)
- 52.203-03 Gratuities (APR 1984)
- 52.203-05 Covenant Against Contingent Fees (APR 1984)
- 52.204-01 Approval of Contract (APR 1984)
- 52.204-02 Security Requirements (APR 1984)
- 52.212-03 Commencement, Prosecution, and Completion of Work (APR 1984)
- 52.212-03 Commencement, Prosecution, and Completion of Work (ALT I) (APR 1984)
- 52.212-12 Suspension of Work (APR 1984)
- 52.212-13 Stop-Work Order (APR 1984)
- 52.215-01 Examination of Records by Comptroller General (APR 1984)
- 52.215-02 Audit - Negotiation (APR 1984)
- 52.215-22 Price Reduction for Defective Cost or Pricing Data (APR 1984)
- 52.215-23 Price Reduction for Defective Cost or Pricing Data-- Modifications (APR 1985)
- 52.215-24 Subcontractor Cost or Pricing Data (APR 1985)
- 52.215-25 Subcontractor Cost or Pricing Data-- Modifications (APR 1985)
- 52.215-31 Waiver of Facilities Capital Cost of Money (APR 1984)
- 52.217-06 Option for Increased Quantity (APR 1984)
- 52.217-09 Option to Extend the Term of the Contract Services (APR 1984)
- 52.219-08 Utilization of Small Business Concerns and Small Disadvantaged Business Concerns (JUN 1985)
- 52.219-09 Small Business and Small Disadvantaged Business Subcontracting Plan (APR 1984)
- 52.219-13 Utilization of Women-Owned Small Business (APR 1984)
- 52.222-26 Equal Opportunity (APR 1984)
- 52.222-29 Notification of Visa Denial (APR 1984)
- 52.222-35 Affirmative Action for Special Disabled and Vietnam Era Veterans (APR 1984)
- 52.222-36 Affirmative Action for Handicapped Workers (APR 1984)
- 52.225-11 Certain Communist Areas (APR 1984)
- 52.227-03 Patent Indemnity (APR 1984)
- 52.228-03 Worker's Compensation Insurance (DBA) (APR 1984)
- 52.229-06 Taxes - Foreign Fixed-Price Contracts (APR 1984)
- 52.230-05 Disclosure and Consistency of Cost Accounting Practices (APR 1984)
- 52.232-05 Payments under Fixed-Price Construction Contracts (JAN 1986)
- 52.232-17 Interest (APR 1984)

52.232-19 Availability of funds for the Next Fiscal Year (APR 1984)

52.232-23 Assignment of Claims (APR 1984)

52.233-01 Disputes (ALT I)(APR 1984)

52.236-05 Material and Workmanship (APR 1984)

52.236-07 Permits and Responsibilities (APR 1984)

52.236-17 Layout of Work (APR 1984)

52.236-21 Specifications and Drawings for Construction (APR 1984)

52.236-23 Responsibility of the Architect-Engineer Contractor (APR 1984)

52.236-24 Work Oversight in Architect-Engineer Contracts (APR 1984)

52.242-01 Notice of Intent to Disallow Costs (APR 1984)

52.243-01 Changes--Fixed-Price (APR 1984)

52.243-01 Changes Fixed Price (ALT I) (APR 1984)

52.244-01 Subcontracts Under Fixed Price Contracts (APR 1984)

52.244-04 Subcontractors and Outside Associates and Consultants (APR 1984)

52.246-04 Inspection of Services Fixed Price (APR 1984)

52.246-04 Limitation of Liability--High-Value Items (APR 1984)

52.247-63 Preference for U.S.-Flag Air Carriers (APR 1984)

52.249-04 Termination (APR 1984)

52.249-10 Default (Fixed-Price Construction) (APR 1984)

52.249-14 Excusable Delays (APR 1984)

## II. USAID ACQUISITION REGULATION (48 CFR Chapter 7) CLAUSES

752.202-70 AID Definitions Clause (APR 1984)

752.202-72 AID Definitions Clause - Supplement (APR 1984)

752.204-2 Security Requirements (APR 1984)

752.209-70 Requirements for Past Performance References (NOV 1982)

752.219-8 Utilization of Small Business Concerns and Small Disadvantaged Business Concerns (APR 1984)

752.228-71 Insurance--Workers' Compensation, Private Automobiles, Marine and Air Cargo (APR 1984)

752.245-70 Government Property--AID Reporting Requirements (APR 1984)

752.245-71 Title to and Care of Property (APR 1984)

752.7001 Biographical Data (APR 1984)

752.7002-71 Travel and Transportation (APR 1984)

752.7002-74 International Travel Approval and Notification Requirements (APR 1984)

752.7003-70A Interest on Overdue Payments (APR 1984)

752.7003-70B Payment Due Dates (NOV 1984)

752.7003-70C Invoice Requirements (APR 1984)

752.7003-71 Documentation for Payment (APR 1984)

752.7004 Source and Nationality Requirements (NOV 1984)

752.7005 Language, Weights and Measures (APR 1984)

752.7007 Personnel Compensation (AUG 1984)

752.7008 Use of Government Facilities or Personnel (APR 1984)

752.7009 Marking (APR 1984)

752.7010 Conversion of U.S. Dollars to Local Currency (APR 1984)

752.7013-70 Contractor - Mission Relationships (APR 1984)

752.7014 Notice of Changes in Travel Regulations (APR 1984)  
 752.7015 Use of Pouch Facilities (APR 1984)  
 752.7017 Local Cost Financing With U.S. Dollars (APR 1984)  
 752.7018 Health and Accident Coverage for AID Participant  
 Trainees (AUG 1984)  
 752.7019-70 Participant Training (APR 1984)  
 752.7020 Organizational Conflicts of Interest (MAR 1985)  
 752.7025 Approvals (APR 1984)  
 752.7026-71 Reports (APR 1984)  
 752.7027-70 Personnel (APR 1984)  
 752.7029 Post Privileges (APR 1984)

52.252-02 Clauses Incorporated by Reference (APR 1984)  
 52.252-04 Alterations in Contract (APR 1984)

### III. GENERAL PROVISIONS

- a. Pursuant to a bilateral agreement (Arab Republic of Egypt Economic, Technical and Related Assistance Agreement) between the United States Government and the A.R.E., the Supplier, its subcontractors, and those of their employees who are not residents of the A.R.E. shall be free of all taxes, fees, levies, customs, or impositions imposed under laws in effect in the A.R.E. with respect to all equipment and materials supplied and services performed under this contract. This exemption includes all customs, duties, and registration fees.
- b. The Government will allow the Supplier, its subcontractors, and their employees to import free of all taxes, fees, levies, customs, duties, impositions, and registration fees such materials and equipment as may be required under this contract.
- c. Any taxes, fees, levies, customs, or duties, impositions, or registration fees within the scope of paragraphs "a" and "b" above paid by the Supplier shall be reimbursed by the Egyptian Electricity Authority/EREDO of the A.R.E. in LE. The Supplier shall, before paying any such amounts, obtain the approval of the Egyptian Electricity Authority in writing.

### IV. ALTERATIONS IN CONTRACT (APR 1984)

Portions of this contract are altered as follows:

1. FAR 52.202-1, "Definitions," is altered to add the following:
  - 752.202 Definitions (APR 1984) (ALT 70)
  - 752.202 Definitions - Contracts Involving Performance  
 Overseas (APR 1984) (ALT 72)
2. FAR 52.201-1, "Officials Not to Benefit," is hereby modified to specify that it refers to United States Officials.

3. FAR 52.204-2, "Security Requirements," (APR 1984) is amended to add the following paragraph:

"(a) This clause applies to the extent that this contract involves access to classified ('Confidential,' 'Secret,' or 'Top Secret'), or administratively controlled ('Limited Official Use') information."

4. FAR 52.210-8, "Utilization of Small Concerns and Small Disadvantaged Business Concerns (APR 1984)," is amended to add the following paragraph:

"AID small business provision. To permit AID, in accordance with the small business provisions of the Foreign Assistance Act, to give small business firms an opportunity to participate in supplying equipment supplies and services financed under this contract, the Contractor shall, to the maximum extent possible, provide the following information to the Office of Small and Disadvantaged Business Utilization/MRC, AID, Washington, D.C. 20523, at least 45 days prior to placing any order in excess of five thousand dollars (\$5,000), except where a shorter time is requested of, and granted by OSDBU/MRC:

PART III

SECTION J - LIST OF ATTACHMENTS

1. SF 1411, Contracting Pricing Proposal Cover Sheet (1 page).
2. AID 1420-18 (3-80), Offeror's Analysis of Cost Proposals (2 pages).
3. AID 1420-17 (3-80), Contractor Employee Biographical Data Sheet (2 pages).
4. Annual Report of Government Property in Contractor's Custody (1 page).
5. Property Inventory Verification (1 page).

# CONTRACT PRICING PROPOSAL COVER SHEET

1. SOLICITATION/CONTRACT/MODIFICATION NO.

FORM APPROVED  
OMB NO.  
3090-0116

NOTE: This form is used in contract actions if submission of cost or pricing data is required. (See FAR 15.804-6(b))

2. NAME AND ADDRESS OF OFFEROR (Include ZIP Code)

3A. NAME AND TITLE OF OFFEROR'S POINT OF CONTACT

3B. TELEPHONE NO.

4. TYPE OF CONTRACT ACTION (Check)

A. NEW CONTRACT

D. LETTER CONTRACT

B. CHANGE ORDER

E. UNPRICED ORDER

C. PRICE REVISION/  
REDETERMINATION

F. OTHER (Specify)

5. TYPE OF CONTRACT (Check)

FFP

CPFF

CPIF

CPAF

FPI

OTHER (Specify)

6. PROPOSED COST (A+B=C)

A. COST

B. PROFIT/FEE

C. TOTAL

\$

\$

\$

7. PLACE(S) AND PERIOD(S) OF PERFORMANCE

8. List and reference the identification, quantity and total price proposed for each contract line item. A line item cost breakdown supporting this recap is required unless otherwise specified by the Contracting Officer. (Continue on reverse, and then on plain paper, if necessary. Use same headings.)

A. LINE ITEM NO.	B. IDENTIFICATION	C. QUANTITY	D. TOTAL PRICE	E. REF

9. PROVIDE NAME, ADDRESS, AND TELEPHONE NUMBER FOR THE FOLLOWING (If available)

A. CONTRACT ADMINISTRATION OFFICE

B. AUDIT OFFICE

10. WILL YOU REQUIRE THE USE OF ANY GOVERNMENT PROPERTY IN THE PERFORMANCE OF THIS WORK? (If "Yes," identify)

YES  NO

11A. DO YOU REQUIRE GOVERNMENT CONTRACT FINANCING TO PERFORM THIS PROPOSED CONTRACT? (If "Yes," complete Item 11B)

YES  NO

11B. TYPE OF FINANCING (✓ one)

ADVANCE PAYMENTS  PROGRESS PAYMENT

GUARANTEED LOANS

12. HAVE YOU BEEN AWARDED ANY CONTRACTS OR SUBCONTRACTS FOR THE SAME OR SIMILAR ITEMS WITHIN THE PAST 3 YEARS? (If "Yes," identify item(s), customer(s) and contract number(s))

YES  NO

13. IS THIS PROPOSAL CONSISTENT WITH YOUR ESTABLISHED ESTIMATING AND ACCOUNTING PRACTICES AND PROCEDURES AND FAR PART 31 COST PRINCIPLES? (If "No," explain)

YES  NO

14. COST ACCOUNTING STANDARDS BOARD (CASB) DATA (Public Law 91-379 as amended and FAR PART 30)

A. WILL THIS CONTRACT ACTION BE SUBJECT TO CASB REGULATIONS? (If "No," explain in proposal)

YES  NO

B. HAVE YOU SUBMITTED A CASB DISCLOSURE STATEMENT (CASB DS-1 or 2)? (If "Yes," specify in proposal the office to which submitted and if determined to be adequate)

YES  NO

C. HAVE YOU BEEN NOTIFIED THAT YOU ARE OR MAY BE IN NON-COMPLIANCE WITH YOUR DISCLOSURE STATEMENT OR COST ACCOUNTING STANDARDS? (If "Yes," explain in proposal)

YES  NO

D. IS ANY ASPECT OF THIS PROPOSAL INCONSISTENT WITH YOUR DISCLOSED PRACTICES OR APPLICABLE COST ACCOUNTING STANDARDS? (If "Yes," explain in proposal)

YES  NO

This proposal is submitted in response to the RFP contract, modification, etc. in Item 1 and reflects our best estimates and/or actual costs as of this date.

15. NAME AND TITLE (Type)

16. NAME OF FIRM

17. SIGNATURE

18. DATE OF SUBMISSION

- 109 -

INSTRUCTIONS TO OFFERORS

FAR 15.804-6(b)

1. The "Offeror's Analysis of Cost Proposal" form is a standardized document which an offeror must submit to the Agency for International Development (AID) in connection with negotiated procurements. (See AIDPR 7-16.806.)

2. Use of this form is mandatory unless the Contracting Officer waives this requirement in writing. Where a particular cost element is not appropriate for the procurement, indicate "Not Applicable or "NA" on the form.

3. The offeror must also submit the supplementary data as detailed in the footnotes on the reverse side.

4. By submission of this proposal, the offeror grants to the Contracting Officer or his authorized representative, the right to examine, for the purpose of verifying the cost or pricing data submitted, those books, records, documents, and other supporting data which will permit adequate evaluation of such cost or pricing data, together with the computations and projections used therein. This right may be exercised in connection with any negotiations prior to contract award.

5. The footnotes on the reverse side, in addition to detailing the required supplemental data, provide information which will be of use in completing the "Cost Proposal" below.

I. Salaries 1/		MAN-MONTHS	ESTIMATED COST
A. U.S. Personnel			
Home Office Professional			\$
Home Office Nonprofessional			\$
Field Staff Professional			\$
Field Staff Nonprofessional			\$
Total U.S. Salaries			\$
B. Cooperating or Third Country Nationals			
Field Staff Professional			\$
Field Staff Nonprofessional			\$
If these salaries will be paid in U.S. dollars, enter the amount here:			\$
If these salaries will be paid in local currency, enter the amount and currency below			\$
Amount:	Currency:		
II. Consultants 2/			
Consultant Fees (Domestic)			\$
Consultant Fees (Overseas)			\$
Total Consultant Fees			\$
III. Fringe Benefits (Payroll Costs) 2/			
			\$
IV. Overhead 4/			
	BASE	RATE	
Home Office (On-campus)	\$	%	\$
Field Staff (Off-campus)	\$	%	\$
Total Overhead			\$
V. Travel and Transportation 2/			
U.S. Travel (Personnel and Dependents)			\$
International Travel (Personnel and Dependents)			\$
Other Personnel Travel			\$
Transportation of Household Effects, Baggage & Vehicles			\$
Storage of Household Effects & Vehicles			\$
Other (Describe)			\$
Total Travel & Transportation			\$
VI. Allowance 6/			
Category			
Post Differential			\$
Quarters			\$
Temporary Lodging			\$
Education			\$
Educational Travel			\$
Supplemental Post			\$
Separate Maintenance			\$
Per Diem			\$
Total Allowances			\$
VII. Other Direct Costs 7/ (Specify)			
			\$
			\$
Total Other Direct Costs			\$
VIII. Equipment, Vehicles, Materials and Supplies 8/			
Equipment (Title in cooperating country)			\$
Equipment (Title retained in AID)			\$
Material and Supplies			\$
Vehicles			\$
Freight			\$
Total Equipment, Vehicles, Materials and Supplies			\$
IX. Participant Training 9/			
Number of Participants:			
Training (Tuition, Fees, etc.)			\$
Travel and Subsistence			\$
Total Participant Training			\$
X. Subcontracts 10/ (Specify)			
			\$
			\$
Total Subcontracts			\$
XI. Royalties 11/			
			\$

XII. General & Administrative Rate <sup>12/</sup>		ESTIMATED COST
Base:	Rate	\$
XIII. Subtotal (Estimated Cost Exclusive of Fixed Fee or Profit) (Items LXIII)		\$
XIV. Fixed Fee or Profit <sup>13/</sup>		\$
Base:	Rate	\$
XV. Grand Total (Items XIII & XIV)		\$

If more space is required and for items XVI thru XXI where additional information is necessary, please use separate sheet. Indicate item number to which answer applies and staple to form.

XVI. Has any government agency performed an audit of your organization within the past 12 months?  
 Yes  No  
 (If yes, identify the contract, the agency, the date, and the number of the audit report.)

XVII. Will you require the use of any government property in performing this contract?  
 Yes  No (If yes, specify)

XVIII. Will the source of all commodities procured under this contract be the United States? <sup>14/</sup>  
 Yes  No (If not, list the exceptions.)

XIX. Have you performed any contracts for AID or other government agencies in the past ten years?  
 Yes  No (If yes, identify by Agency and contract number.)

XX. Will you require an advance payment or a Federal Reserve Letter of Credit (to be filled in by educational institutions and nonprofit organizations only).  
 Yes  No (If yes, in what amount?)

XXI. Is there any overtime included in this cost proposal?  
 Yes  No (If yes, explain the amount and what it will be used for.)

XXII. What is the average number of days per year used in the calculation of the above cost proposal for:  
 Vacations \_\_\_\_\_ Holidays \_\_\_\_\_ Other (explain) \_\_\_\_\_  
 Sick Leave \_\_\_\_\_ Home Leave \_\_\_\_\_

This proposal, with the supplementary data, is submitted for use in connection with RFP \_\_\_\_\_ or the proposal titled " \_\_\_\_\_ " and reflects our best estimates, as of this date, in accordance with the instructions to Offerors and Footnotes.

TYPE NAME AND TITLE	SIGNATURE
FIRM	DATE

FOOTNOTES

In addition to the cost analysis on this form, the offeror is required, in good faith, to submit with this form the additional data, supporting schedules, and substantiation which are reasonably necessary for the conduct of an appropriate review and analysis in light of the facts of this particular procurement. In order to obtain a reasonable and equitable contract price, it is essential that there be a clear understanding of: (a) the existing, verifiable data; and (b) the judgmental factors applied in projecting from known data to the estimated price. In short, the offeror's estimating process should be clear to the negotiator.

The footnotes below include questions and explanations of the items of the Cost Analysis. The supplementary data should include all the following information, where applicable, as well as any other pertinent facts.

- Salaries (U. S. Personnel and Cooperating or Third Country Nationals)
  - An individual is considered a professional if he is engaged in an occupation requiring advanced training in some liberal art or science, usually involving mental rather than manual work and who is qualified in his field by the standards of the profession. Examples are: professors, teachers, engineers, economists, scientists, and research associates.
  - The nonprofessional category includes those not considered professional such as graduate or undergraduate assistants, secretaries, clerks, technicians, administrative aides, research assistants, and trainees.
  - What are the position titles in each category? How many months are anticipated in each position? What is the anticipated salary of each position? Will each position involve work under this contract on a full-time basis? If not, what percentage of each position's time will be used for work under this contract?
- Consultants
  - A consultant is a person who serves as an advisor to the Contractor, as distinguished from an officer or employee who carries out the Contractor's duties and responsibilities.
  - In what fields is the need for consultants anticipated? How many consultants are needed? How many mandays are anticipated for each consultant? What is the anticipated fee per manday for each consultant? Does the fee include travel and transportation costs?
- Fringe Benefits -- Which fringe benefits are included in this amount? What is the rate of each fringe benefit? Are fringe benefits included in your established personnel procedure? (Enclose a copy, if available, of your established personnel procedure concerning fringe benefits, allowances, leave, etc.)
- Overhead -- What costs are included in the overhead pool? Which direct costs are included in the overhead base? What were the rates established by the most recent government audit?
- Travel and Transportation -- Indicate how many round or one-way trips to where, an estimate of how many dependents will be traveling, and the anticipated weight of household effects which will be shipped and/or stored, etc.
- Allowances -- AID employs the "Standardized Government Travel Regulations" or "Standardized Regulations (Government Civilian Foreign Areas)" as applicable, in establishing the rates of, and criteria for, travel and overseas allowances. If the allowances used in the cost analysis exceed the rates permitted by these Regulations, explain. Indicate which allowances are applicable, and how much of each is anticipated, (i.e., educational travel for four dependents, 20 days per diem).
- Other Direct Costs -- Enumerate all other direct costs, such as medical examinations, communications, etc.
- Equipment, Vehicles, Materials, and Supplies -- List the types of equipment, materials, and/or vehicles in each category which will be purchased for use under the contract, and the cost of each.
- Participant Training -- Where will participants be trained? In what fields will they be trained? What is the tuition per participant? What do the fees cover? How much travel is involved? Where? How much is allowed for subsistence?

10. Subcontracts -- What type of work will be subcontracted? Approximately what percentage of the total scope of work is it? Whom will you subcontract with? What is the anticipated amount of each subcontract?

11. If the total cost entered here is in excess of \$250, provide on a separate page the following information on each separate item of royalty or license fee: name and address of licensor; date of license agreement; patent numbers, patent application serial numbers, or other basis on which the royalty is payable; brief description, including any part or model numbers of each contract item or component on which the royalty is payable; percentage or dollar rate of royalty per unit; unit price of contract item; number of units; and total dollar amount of royalties. In addition, if specifically requested by the Contracting Officer, a copy of the current license agreement and identification of applicable claims of specific patents shall be provided.

12. General and Administrative Rate -- Show, in detail, the process by which you arrived at the General and Administrative rate.

13. Fixed Fee or Profit -- Show, in detail, the process by which you arrived at the fixed fee or profit.

14. Source Certificates -- The following conditions should apply to any commodity procurement financed under the proposed contract by U.S. dollars:

- The source of the commodity shall be the United States, and the commodity shall have been mined, grown, or through manufacturing, processing, or assembly produced in the United States. The term "source" means the country from which a commodity is shipped to the cooperating country or the cooperating country if the commodity is located therein at the time of purchase. If, however, a commodity is shipped from a free port or bonded warehouse in the form in which it is received therein, "source" means the country from which the commodity was shipped to the free port or bonded warehouse.
- A produced commodity purchased in any transaction will not:
  - Contain any component from countries other than Free World countries, as defined in AID Geographic Code 899.
  - Contain components which were imported into the country of production from such Free World countries other than the United States; and
  - Such components were acquired by the producer in the form in which they were imported; and
  - The total cost of such components (delivered at the point of production) amounts to more than 10 per cent, or such other percentage as AID may prescribe, of the lowest price (including the cost of ocean transportation and marine insurance) at which the supplier makes the commodity available for export sale (whether or not financed by AID).

C. Exception for Printed or Audio-visual Teaching Materials --

- The geographic source of teaching materials (printed or audio-visual) procured with funds charged against AID appropriations, may, to the extent necessary, be progressively expanded to include the aid receiving country, Code 901 countries, and Code 899 countries, in addition to the United States when:
- Effective use of the printed or audio-visual teaching material depends on their being in the local language.
  - Such materials are intended for technical assistance projects or activities financed by AID in whole or in part.
  - Other funds, including U. S.-owned or -controlled local currencies, are not readily available to finance the procurement of such materials.

Geographic Code 899 is defined as "any area or country in the Free World, excluding the cooperating country itself, when used as a possible source of AID financed purchases. Geographic Code 901 is defined as "any area or country in the Free World, excluding the cooperating country itself and the following developed countries: Australia, Austria, Belgium, Canada, Denmark, France, Germany (Federal Republic), Italy, Japan, Luxembourg, Monaco, Netherlands, New Zealand, Norway, South Africa, Spain, Sweden, Switzerland, and the United Kingdom.

## CONTRACTOR EMPLOYEE BIOGRAPHICAL DATA SHEET

(SEE PRIVACY ACT STATEMENT ON REVERSE)

**INSTRUCTIONS:**  
Submit in triplicate to contracting officer.  
See reverse for Contractor Certification.

1. Name (Last, First, Middle) <input type="checkbox"/> Mr. <input type="checkbox"/> Mrs. <input type="checkbox"/> Miss <input type="checkbox"/> Ms.		2. Contractor's Name	
3. Address (include ZIP Code)		4. Contract No.	5. Position Under Contract
9. Telephone Number (include area code)		6. Proposed Salary	7. Country of Assignment
10. Marital Status <input type="checkbox"/> Married <input type="checkbox"/> Single <input type="checkbox"/> Other (specify) _____		8. Duration of Assignment	
12. Date of Birth	13. Place of Birth	11. Names and Ages of Dependents to Accompany Individual (if applicable)	
14. Citizenship (if non-U.S. citizen, give visa status)			

### 15. EDUCATION (include all secondary, business college or university training)

NAME AND LOCATION OF INSTITUTION	MAJOR SUBJECTS	Credits Completed		Type of Degree	Date of Degree
		Semester Hours	Quarter Hours		

### 16. EMPLOYMENT HISTORY

1. Give last three (3) years. Continue on reverse to list all employment related to duties of proposed assignment.
2. Salary definition - basic periodic payment for services rendered.  
Exclude bonuses, profit-sharing arrangements, commissions, consultant fees, extra or overtime work payments, overseas differential, or quarters, cost of living or dependent education allowances.

POSITION TITLE	EMPLOYER'S NAME AND ADDRESS	Dates of Employment (Mo., Yr.)		Salary	
		From	To	Dollars	Per.

### 17. SPECIFIC CONSULTANT SERVICES (give last three (3) years)

SERVICE PERFORMED	EMPLOYER'S NAME AND ADDRESS	Dates of Employment (Mo., Yr., Day)		DAILY RATE
		From	To	

### 18. LANGUAGE PROFICIENCY

LANGUAGE	Speaking			Reading			Writing			Understanding		
	Fair	Good	Excl.	Fair	Good	Excl.	Fair	Good	Excl.	Fair	Good	Excl.

19. Special Qualifications (honors, professional societies, special licenses, publications, research, special skills, and relevant education not previously mentioned; use reverse side of form, if necessary)

**20. CERTIFICATION:** To the best of my knowledge, the above facts as stated are true and correct.

Signature of Employee

**CONTRACTOR'S CERTIFICATION** (To be completed by responsible representative of Contractor)

A. I hereby certify that ('X' appropriate box):

- The initial salary proposed herein meets the salary standards prescribed in the contract.
- The salary increase proposed herein conforms to the customary policy and practice for this organization for periodic salary increases.

B. Justification or Remarks

Signature	Title	Date
-----------	-------	------

**PRIVACY ACT STATEMENT**

The following statement is required by the Privacy Act of 1974 (Public Law 93-579; 88 Statute 1896).

The information requested on this form is needed by AID to evaluate your suitability for the position for which you have been nominated as a contract employee. It is necessary that you provide the information for AID to consider your nomination. The Foreign Assistance Act of 1961, as amended, constitutes authority for its collection.

Employers and educational institutions you list may be contacted for verification of the information provided. Disclosure may otherwise be made in whole or in part to any (a) foreign government concerned if required by that government in connection with their review of your nomination and (b) pursuant to any other applicable routine use listed under AID's Civil Service Employee Office Personnel Record System, AID-2 in AID's Notice of Systems of Records for implementing the Privacy Act as published in the Federal Register, or (c) when disclosure without the employee's consent is authorized by the Privacy Act and provided for in AID Regulation 15. (A copy of the Regulation and Notice of System of Records is available from AID Distribution on request.)

ANNUAL REPORT OF GOVERNMENT PROPERTY  
IN CONTRACTOR'S CUSTODY

(Name of Contractor)

As of (End of Contract Year, 19xx)

---

	Motor vehicles	Furniture and furnishings-- Office/Living quarters	Other nonexpendable property
A.	Value of property as of last report.		
B.	Transactions during this reporting period.		
1.	Acquisitions (add):		
a.	Purchased by Contractor <u>1/</u>		
b.	Transferred from AID <u>2/</u>		
c.	Transferred from others-without reimbursement <u>3/</u>		
2.	Disposals (deduct):		
a.	Returned to AID		
b.	Transferred to AID- Contractor Purchased		
c.	Transferred to other Government agencies <u>3/</u>		
d.	Other disposals <u>3/</u>		
C.	Value of property as of reporting date.		
D.	Estimated average age of Contractor held property.		

---

1/ Property which is complete in itself, does not lose its identity or become a component part of another article when put into use; is durable, with an expected service life of two years or more; and which has a unit cost of more than \$500.

2/ Government furnished property listed in this Contract as non-expendable.

3/ Explain if transactions were not processed through or otherwise authorized by AID.

PROPERTY INVENTORY VERIFICATIONS

I attest that (1) physical inventories of Government property are taken not less frequently than annually; (2) the accountability records maintained for Government property in our possession are in agreement with such inventories; and 3/ the total of the detailed accountability records maintained agrees with the property value shown opposite line C above, and the estimated average age of each category of property is as cited opposite line D above.

---

Authorized Signature.

PART IV

SECTION K - REPRESENTATIONS, CERTIFICATIONS, AND ACKNOWLEDGEMENTS

1. Contingent Fee Representation and Agreement
2. Type of Business Organization
3. Authorized Negotiators
4. Other Communications
5. Period for Acceptance of Offer
6. Place of Performance
7. Federal Procurement Data
8. Small Business Concern Representation
9. Small Disadvantaged Business Concern Representation
10. Women-Owned Small Business Representation
11. Certification of Nonsegregated Facilities
12. Previous Contracts and Compliance Reports
13. Affirmative Action Compliance
14. Clean Air and Water Certification
15. Cost Accounting Standards Notices and Certification (Nondefense) -  
(REQUIRED IF OVER \$100K AND NOT SB OR EDUC.)
16. Facilities Capital Cost of Money.

SECTION K - REPRESENTATIONS, CERTIFICATIONS, AND ACKNOWLEDGEMENTS

K.1 52.203-4 Contingent Fee Representation and Agreement (APR 1984)

(a) REPRESENTATION. The offeror represents that, except for full-time bona fide employees working solely for the offeror, the offeror -

[Note: The offeror must check the appropriate boxes. For interpretation of the representation, including the term "bona fide employee", see Subpart 3.4 of the Federal Acquisition Regulation.]

(1) /\_\_\_/ has, /\_\_\_/ has not employed or retained any person or company to solicit or obtain this contract; and

(2) /\_\_\_/ has, /\_\_\_/ has not paid or agreed to pay to any person or company employed or retained to solicit or obtain this contract any commission, percentage, brokerage, or other fee contingent upon or resulting from the award of this contract.

(b) AGREEMENT. The offeror agrees to provide information relating to the above Representation as requested by the Contracting Officer and, when subparagraph (a)(1) or (a)(2) is answered affirmatively, to promptly submit to the Contracting Officer -

(1) A completed Standard Form 119, Statement of Contingent or Other Fees, (SF 119); or

(2) A signed statement indicating that the SF 119 was previously submitted to the same contracting office, including the date and applicable solicitation or contract number and representing that the prior SF 119 applies to this offer or quotation.

K.2 52.215-6 Type of Business Organization (APR 1984)

The offeror or quoter, by checking the applicable box, represents that it operates as /\_\_\_/ a corporation, incorporated under the laws of the State of \_\_\_\_\_, /\_\_\_/ an individual, /\_\_\_/ a partnership, /\_\_\_/ a nonprofit organization, or /\_\_\_/ a joint venture.

K.3 52.215-11 Authorized Negotiators (APR 1984)

The offeror or quoter represents that the following persons are authorized to negotiate on its behalf with the Government in connection with this request for proposals or quotations: {list names, titles, and telephone numbers of the authorized negotiators}.

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Telephone No.: \_\_\_\_\_

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Telephone No.: \_\_\_\_\_

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Telephone No.: \_\_\_\_\_

K.4 Other Communications

To facilitate communications, the following numbers are requested:

(a) TELEX Number: \_\_\_\_\_

(b) TWX Number: \_\_\_\_\_

(c) Fascimile (Telecopier, Datafax, etc.) Number and Extension:

\_\_\_\_\_

If the machine is automatic, is it sent on 4 or 6 minutes?

\_\_\_\_\_

K.5 52.219-19 Period for Acceptance of Offer (APR 1984)

In compliance with the solicitation, the offeror agrees, if this offer is accepted within \_\_\_\_\_ calendar days (60 calendar days unless a different period is inserted by the offeror) from the date specified in the solicitation for receipt of offers, to furnish any or all items on which prices are offered at the price set opposite each item, delivered at the designated point(s), within the time specified in the Schedule.

K.6 52.215-20 Place of Performance (APR 1984)

(a) The offeror or quoter, in the performance of any contract resulting from this solicitation, /\_/ intends, /\_/ does not intend (check applicable block) to use one or more plants or facilities located at a different address from the address of the offeror or quoter as indicated in this proposal or quotation.

(b) If the offeror or quoter checks "intends" in paragraph (a) above, it shall insert in the spaces provided below the required information:

Place of Performance (Street Address, City, County, State, Zip Code)	Name and Address of Owner and Operator of the Plant or Facility if Other than Offeror or Quoter
_____	_____
_____	_____
_____	_____

**K.7 Federal Procurement Data**

Each Contractor receiving an award over \$10,000 will be requested to provide the information as set forth below:

(a) DUNS Identification Number: \_\_\_\_\_

(This number is assigned by Dun and Bradstreet, Incorporated, and is contained in that company's Data Universal Numbering System (DUNS). If the number is not known, it can be obtained from the local Dun and Bradstreet office. If no number has been assigned by Dun and Bradstreet, insert the word "none".)

(b) Home Office County and Congressional District: \_\_\_\_\_

(c) Congressional District of the Principal place of performance:  
\_\_\_\_\_

(d) SIC (Standard Industrial Code): \_\_\_\_\_

**K.8 52.219-1 Small Business Concern Representation (APR 1984)**

The offeror represents and certifies as part of its offer that it /\_\_\_/ is, /\_\_\_/ is not a small business concern and that /\_\_\_/ all, /\_\_\_/ not all supplies to be furnished will be manufactured or produced by a small business concern in the United States, its possessions, or Puerto Rico. "Small business concern", as used in this provision means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the size standards in this solicitation.

**K.9 52.219-2 Small Disadvantaged Business Concern Representation (APR 1984)**

(a) REPRESENTATION. The offeror represents that it /\_\_\_/ is, /\_\_\_/ is not a small disadvantaged business concern.

(b) DEFINITIONS:

"Asian-Indian American", as used in this provision, means a United States citizen whose origins are in India, Pakistan, or Bangladesh.

"Asian-Pacific American", as used in this provision, means a United States citizen whose origins are in Japan, China, the Philippines, Vietnam, Korea, Samoa, Guam, the U.S. Trust Territory of the Pacific Islands, the Northern Mariana Islands, Laos, Cambodia, or Taiwan.

"Native Americans", as used in this provision, means American Indians, Eskimos, Aleuts, and native Hawaiians.

"Small business concern", as used in this provision, means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria and size standards in 13 CFR 121.

"Small disadvantaged business concern", as used in this provision, means a small business concern that (1) is at least 51 percent owned by one or more individuals who are both socially and economically disadvantaged, or a publicly owned business having at least 51 percent of its stock owned by one or more socially and economically disadvantaged individuals and (2) has its management and daily business controlled by one or more such individuals.

- (c) QUALIFIED GROUPS. The offeror shall presume that socially and economically disadvantaged individuals include Black Americans, Hispanic Americans, Native Americans, Asian-Pacific Americans, Asian-Indian Americans, and other individuals found to be qualified by the SBA under 13 CFR 124.1.

K.10 52.219-3 Women-Owned Small Business Representation (APR 1984)

- (a) REPRESENTATION. The offeror represents that it /\_\_\_/ is, /\_\_\_/ is not a women-owned small business concern.

(b) DEFINITIONS:

"Small business concern", as used in this provision, means a concern including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria and size standards in 13 CFR 121.

"Women-owned", as used in this provision, means a small business that is at least 51 percent owned by a woman or women who are U.S. citizens and who also control and operate the business.

K.11 52.222-21 Certification of Nonsegregated Facilities (APR 1984)

- (a) "Segregated facilities", as used in this provision, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin because of habit, local custom, or otherwise.
- (b) By the submission of this offer, the offeror certifies that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The offeror agrees that a breach of this certification is a violation of the Equal Opportunity clause in the contract.
- (c) The offeror further agrees that (except where it has obtained identical certifications from proposed subcontractors for specific time periods) it will -
  - (1) Obtain identical certifications from proposed subcontractors before the award of subcontracts under which the subcontractor will be subject to the Equal Opportunity clause;
  - (2) Retain the certifications in the files; and
  - (3) Forward the following notice to the proposed subcontractors (except if the proposed subcontractors have submitted identical certifications for specific time periods):

NOTICE TO PROSPECTIVE SUBCONTRACTOR OF REQUIREMENTS  
FOR CERTIFICATIONS OF NONSEGREGATED FACILITIES

A Certification of Nonsegregated Facilities must be submitted before the award of a subcontract under which the subcontractor will be subject to the Equal Opportunity clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually).

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

K.12 52.222-22 Previous Contracts and Compliance Reports (APR 1984)

The offeror represents that:

- (a) It /\_\_\_/ has, /\_\_\_/ has not participated in a previous contract or subcontract subject either to the Equal Opportunity clause of this solicitation, the clause originally contained in Section 310 of Executive Order No. 10925, or the clause contained in Section 201 of Executive Order No. 11114;

- (b) It /\_\_\_/ has, /\_\_\_/ has not, filed all required compliance reports; and
- (c) Representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained before subcontract awards.

K.13 52.222-25 Affirmative Action Compliance (APR 1984)

The offeror represents that (a) it /\_\_\_/ has developed and has on file, /\_\_\_/ has not developed and does not have on file, at each establishment, affirmative action programs required by the rules and regulations of the Secretary of Labor (41 CFR 60-1 and 60-2), or (b) it /\_\_\_/ has not previously had contracts subject to the written affirmative action programs requirement of the rules and regulations of the Secretary of Labor.

K.14 52.223-1 Clean Air and Water Certification (APR 1984)

The offeror certifies that -

- (a) Any facility to be used in the performance of this proposed contract is /\_\_\_/, is not /\_\_\_/ listed on the Environmental Protection Agency List of Violating Facilities;
- (b) The offeror will immediately notify the Contracting Officer, before award, of the receipt of any communication from the Administrator, or a designee, of the Environmental Protection Agency, indicating that any facility that the Offeror proposes to use for the performance of the contract is under consideration to be listed in the EPA List of Violating Facilities; and
- (c) The offeror will include a certification substantially the same as this certification, including this paragraph (c), in every nonexempt subcontract.

K.15 52.230-2 Cost Accounting Standards Notices and Certification (Nondefense) (APR 1984)

Note: This notice does not apply to small businesses or foreign governments.

- (a) Any contract over \$100,000 resulting from this solicitation shall be subject to Cost Accounting Standards (CAS) if it is awarded to a business unit that is currently performing a national-defense CAS-covered contract or subcontract, except when -
  - (1) The award is based on adequate price competition;
  - (2) The price is set by law or regulation;
  - (3) The price is based on established catalog or market prices of commercial items sold in substantial quantities to the general public; or

(4) One of the exemptions in 4 CFR 331.30(b) applies (also see Federal Acquisition Regulation [FAR] 30.301(b)).

(b) Contracts not exempted from CAS shall be subject to fully or modified coverage as follows:

(1) If the business unit receiving the award is currently performing a national defense contract or subcontract subject to fully CAS coverage (4 CFR 331), this contract will have full CAS coverage and will contain the clauses from the FAR entitled Cost Accounting Standards (52.230-3) and Administration of Cost Accounting Standards (52-230-4).

(2) If the business unit receiving the award is currently performing a national defense contract or subcontract subject to modified CAS coverage (4 CFR 332), this contract will have modified coverage and will contain the clauses entitled Disclosure and Consistency of Cost Accounting Practices (52.230-5) and Administration of Cost Accounting Standards (52.230-4).

A. Certificate of CAS Applicability

The offeror hereby certifies that:

/\_\_\_/ -The offeror is not performing any CAS-covered national defense contract or subcontract. The offeror further certifies that it will immediately notify the Contracting Officer in writing if it is awarded any national defense CAS-covered contract or subcontract subsequent to the date of this certificate but before the date of the award of a contract resulting from this solicitation. (If this statement applies, no further certification is required.)

/\_\_\_/ The offeror is currently performing a negotiated national defense contract or subcontract that contains the Cost Accounting Standards clause at FAR 52.230-3.

/\_\_\_/ The offeror is currently performing a negotiated national defense contract or subcontract that contains the Disclosure and Consistency of Cost Accounting Practices clause at FAR 52.230-5.

B. Additional Certification - CAS Applicable Offerors

/\_\_\_/ The offeror subject to Cost Accounting Standards further certifies that practices used in estimating costs in pricing this proposal are consistent with the practices disclosed in the Disclosure Statement where it has been submitted pursuant to CAS Board regulations (4 CFR 351).

C. Data Required - CAS Covered Offerors

The offeror certifying that it is currently performing a national defense contract containing either CAS clause (see A above) is required to furnish the name, address (including agency or department component), and telephone number of the cognizant Contracting Officer administering the offeror's CAS-covered contracts.

Name of Contracting Officer: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Telephone Number: \_\_\_\_\_

K.16 Facilities Capital Cost of Money

Facilities capital cost of money will be an allowable cost under the contemplated contract, but only if the contractor specifically identifies or proposes it in the cost proposal for the contract and elects to claim this cost by checking the appropriate box below. If the contractor does not specifically identify or propose facilities capital cost of money and does not elect to claim this cost, the contract will include the Waiver of Facilities Capital Cost of Money Clause.

- (a) The prospective contractor has specifically identified or proposed facilities capital cost of money in its cost proposal and elects to claim this cost as an allowable cost under the contract.
- (b) The prospective contractor has not specifically identified or proposed facilities capital cost of money in its proposal and elects not to claim it as an allowable cost under the contract.

SECTION L - INSTRUCTIONS, CONDITIONS, AND NOTICES TO OFFERORS

L.1. Type of Contract

The Government contemplates awarding a FIXED PRICE type multiyear contract.

L.2. Contracting with Small Business Concerns, Small Disadvantaged Business Concerns, and Women-Owned Small Business Concerns

AID encourages the participation to the maximum extent possible of small business concerns, small disadvantaged business concerns, and women-owned small business concerns in this activity as prime contractors or subcontractors in accordance with Part 19 of the Federal Acquisition Regulation. In this respect, it is anticipated that AID will make every reasonable effort to identify and make maximum practicable use of such concerns. All selection evaluation criteria being found equal, the participation of such concerns may become a determining factor for selection.

L.3. Instructions for Preparation of Proposals

Proposals shall be submitted in two separate parts entitled, "Technical Proposal" and "Business Management Proposal". Technical Proposals shall not make reference to price data in order that evaluation may be made on the basis of technical merit. Price data shall be provided separately. Five (5) copies of the "Technical Proposal" and two (2) copies of the "Business Management Proposal" signed by an official authorized to bind the Offeror shall be submitted not later than the date and time specified in the cover page to this RFP.

Proposals should be mailed to:  
Mr. Orion Yeandel  
Office of Contract Services  
USAID, Box 10  
FPO NY 09527-0008

Proposals delivered by courier to:  
Mr. Orion Yeandel  
Office of Contract Services  
USAID/Egypt  
106 Kasr EL Aini Street  
Cairo, Egypt

L.3.a Technical Proposal

The technical proposal you prepare will be a major factor in determining your consideration for negotiation and/or award of a contract for the requirement described by this Request for Proposal. Your proposal should state clearly your personnel and organizational credentials to carry out the activity, and how you intend to facilitate the accomplishment of AID's program. Elaborate formats and expensive binders are not desirable. Clarity, completeness, and directness are much more important. Five copies of the technical proposals should be submitted to the Agency for International Development. Proposals should be in the English language and typed on standard 8 1/2" x 11" paper, single spaced, with each page numbered consecutively. Proposals may be marked as privileged communications and their contents will not be disclosed except for evaluation purposes.

Bidders should pay particular attention to the Selection Criteria (Part IV, Section M of this RFP) and be sure to respond to each item mentioned.

The format for proposals is as follows:

1. Cover

Indicate:

- a. That the proposal is made to the Agency for International Development.
- b. The name of the investigators and proposing institution.
- c. A brief descriptive title of the proposed activity.

2. Title Page

Indicate:

- a. The full legal name and address of the organization submitting the proposal, and the date of submission.
- b. Type of organization, e.g., profit, non-profit, educational, other.
- c. Brief descriptive title of the proposed activity.

3. Table of Contents

Indicate page locations for each of the principal sections of the proposal using the heading below and additional detail as appropriate. A tab index may be helpful for lengthy proposals.

a. Summary

Provide a brief summary (not to exceed one page) of the proposed activity.

b. Description of the Proposal

Follow the outline below, paying attention to all tasks described in Section C.

c. Introduction and Background

Detailed description of services to be provided, tasks to be performed, deliverables, quality control and evaluation mechanisms, and procedures to be followed. Brief statement of your organization's capability of carrying out the statement of work.

d. Detailed Description of the Proposal Keyed to the Scope of Work

(1) Statement of Offeror's understanding of the requirement.

(2) Technical details of facilities and equipment to be utilized in the performance of the tasks outlined in the Statement of Work, including those of any subcontractor(s). Description of special procedures, techniques, systems or facilities which shall be used and which affect factors of production and performance, such as timeliness, economy, efficiency, reliability, and quality.

(3) Indicate, without pricing information, the type and quantities of supplies, materials, and equipment required to complete the work called for. The offeror shall indicate when such items shall be required during the performance of the contract.

(4) Magnitude and nature of subcontract efforts, if any, shall be explained without pricing information.

e. Expected End Results

Describe potential benefits and other end results of the project.

f. Previous Work in this Area by the Proposers

A brief description of previous work relevant to the Statement of Work should be included. This should include results of any preliminary work or pilot studies and appropriate citations.

4. Overall Management

Propose organization to carry out the Statement of Work, including summary functions of activities assigned to organizational units, including those assigned to subcontractors.

5. Professional Personnel and Their Qualifications

Describe the role of each worker to be involved in the project, including the amount of time each will devote to the project. Provide biographic sketches and pertinent bibliographies on all professional personnel involved. The names and experience of important managerial and technical personnel to be assigned to this program shall also be included with Biographical Data Sheets (Part III, Section J). Also indicate whether these personnel are presently available or indicate when, during the program, they will be available. Indicate the total staff which will be required and show in your submission how you propose to administer the Contract. Key personnel must be proposed who are responsible for overall project management, coordination, implementation, and scheduling.

## 6. Experience and Capabilities

Description of general background, experience, and qualifications of the offeror. Special note should be made of work performed on similar or related projects, including documentation with reference to names, addresses, contract numbers, and telephone numbers of recent clients. Also, specify the qualifications of any subcontractor or consultant to be used. Present information about the capabilities of your firm and of the individuals to be assigned to this work, experience and representative accomplishments of both the firm and the individuals in developing and conducting activities of the type required under this contract. Language competence, relevant achievements of personnel, or prior work with USAID should be included. Especially important will be information presented on key personnel for the project, and the roles these individuals are intended to play in the Contractor's efforts.

Potential Contractors will need to demonstrate how they expect to effectively bring their disciplines, functional skills, and experiences to bear on the project and work collectively with U.S., multilateral, and LDC organizations. They will need to make clear what inputs will come from their own staffs and which will come from consultants or subcontractors and, importantly, the plans for coordinating, managing, and integrating these technical staff inputs must be articulated.

The evaluation and Source(s) Selection criteria set forth in Part IV, Section M in this Request for Proposal will indicate to you the basis upon which the Government will select offerors for consideration in the negotiation/award procedure. Be sure you are familiar with these criteria.

### L.3.b Business Management Proposals

A business management proposal should set forth in detail the management structure as it relates to performance of services described in Part I of this solicitation. The business management proposal must be completely separate from the offeror's technical proposal, and shall include whatever schedules are felt necessary to support and/or explain the proposed costs and fixed fee or profit. The offeror's estimating process must be clear and concise and contain an itemized price list.

Full information regarding each item set forth on the following pages shall be furnished in sufficient detail to allow a full and complete business evaluation. If the question is not applicable or the answer is none, it should be so annotated. Failure to furnish full and complete information may cause an offer to be considered non-responsive. Please be certain that all required certifications are properly filled out. (See Section K).

1. Your cost proposal utilizing Standard Form 1411 and the Supplement prepared on the forms provided with this RFP, should be signed and include:

- a. As part of the specific information required, you must submit with your proposal, and clearly identify as such, cost or pricing data (that is, data that are verifiable and factual and otherwise as defined at FAR 15.801). In addition, submit with your proposal any information reasonable required to explain your estimating process, including detailed equipment specifications and costs.
- b. Contractor Employee Bio-Data Sheet (Form AID 1420-17) to support all direct salaries for each principal individual proposed, including consultants. Our main concern is with Blocks 6 and 16 of this form. If you are unable to specify individual technicians, you should indicate the position title and the maximum salary which you would pay for the position. Make certain these forms are signed.
- c. Letter from your cognizant Government Audit Agency stating your latest audited indirect cost rates, the base to which such rates are applied. You should submit sufficient information to allow an A.I.D. auditor to determine the reasonableness of your rates (for example, breakdown of labor base and overhead pool, method of determining rate, profit and loss statement, etc.).
- d. Indicate whether or not your accounting system has been reviewed and/or approved by any Government agency; if so, state:
  - (1) Name and location of cognizant agency;
  - (2) Name and telephone number of cognizant auditor; and
  - (3) The typed of government contracts for which your accounting system has been approved.
- e. Details to all other items of direct cost (equipment, communications, insurance, etc.).
- f. Copy of your personnel policy, especially regarding salary and wage scales, merit increases, promotions, leave differentials, etc.
- g. As soon as practicable after final agreement on price, but before the award resulting from the proposal, you shall, under the conditions stated in FAR 15,804-4, submit a Certificate of Current Cost or Pricing Data.

2. Other Items to be Included in the Cost Proposal

In addition to the information required by Section L.3.a., please make sure that the proposal includes:

- a. Identification of the negotiator or administrator with whom the Government may discuss this RFP.

- b. A statement regarding acceptability of the proposed contract clauses as shown in Part II, "Contract Clauses".
- c. A letter or other statement from each proposed consultant and/or subcontractor indicating that he has been approached on the matter of participation in this study and that he is willing and able to do so in the terms indicated.

3. Contractor Responsibility

The Offeror must submit sufficient evidence of responsibility for the Contracting Officer to make a determination of responsibility pursuant to the requirements of Part 9 of the Federal Acquisition Regulations.

The business management information submitted should substantiate that the Offeror:

- a. Has adequate financial resources or the ability to obtain such resources as required during the performance of the contract.
- b. Is able to comply with the required or proposed delivery or performance schedule, taking into consideration all existing business commitments, commercial as well as governmental;
- c. Has a satisfactory record of performance; and
- d. Has a satisfactory record of integrity and business ethics.
- e. Has the necessary organization, experience, accounting and operational controls and technical skills or the ability to obtain them;
- f. Has the necessary production, construction, and technical equipment and facilities, or the ability to obtain them.
- g. Is otherwise qualified and eligible to receive an award under applicable laws and regulations.

4. Business Management Information

- a. If subcontracting is contemplated, indicate the types of work to be subcontracted, stating:
  - (1) The percentage of each type of work subcontracted to the total work performed (both subcontracted and not subcontracted);
  - (2) Extent to which competition was or will be solicited prior to selection of subcontractors;
  - (3) Methods of analyzing prospective subcontractor proposals; and

(4) Types of subcontracts usually executed by your organization.

b. Indicate the home office management support which will be provided for your performance of the services required.

c. Indicate the date your firm was organized and in which state.

5. Requirement for Past Performance References.

The offeror is required to submit, as part of its proposal, the following additional information with respect to all contracts, grants or cooperative agreements involving the provision of similar or related services over the past three years to A.I.D. and to other organizations (both Commercial and Governmental). Failure to provide complete information regarding previous similar/related contracts, grants, or cooperative agreements may result in eventual disqualification. The information supplied must include the name and address of the organization for which services were performed; the current telephone number of a responsible technical representative of that organization; the number, if any, of each contract, grant or cooperative agreement; and a brief description of the services provided, including the period during which the services were provided. A.I.D. may use this information to contact technical representatives on prior contracts, grants or cooperative agreements to obtain information on performance. The Contracting Officer will consider such performance data along with other factors specified herein in determining whether the offeror is to be considered responsible as defined in FAR, Part 9.

6. The REPRESENTATIONS, CERTIFICATIONS, AND ACKNOWLEDGEMENTS, Section K, must be completed and submitted as a part of your proposal.

L.4 Solicitation Provisions

This solicitation incorporates the following solicitation provisions which are set forth in full text in Section J.

L.5 Solicitation Provisions Incorporated by Reference (APR 1984)

This solicitation incorporates the following solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available.

I. FEDERAL ACQUISITION REGULATION (49 CFR CHAPTER 1) SOLICITATION PROVISIONS

- 52.215-5 Solicitation Definitions (Apr 1984)
- 52.215-7 Unnecessarily Elaborate Proposals for Quotations (Apr 1984)
- 51.215-8 Acknowledgement of Amendments to Solicitations (Apr 1984)
- 52.215-9 Submission of Offers (Apr 1984)

52.215-10 Late submissions, Modifications, and Withdrawals  
of Proposals (Apr 1984)  
52.215-12 Restriction on Disclosure and Use of Data (Apr 1984)  
52.215-13 Preparation of Offers (Apr 1984)  
52.215-14 Explanation to Prospective Offerors (Apr 1984)  
52.215-15 Failure to Submit Offer (Apr 1984)  
52.215-16 Contract Award (Apr 1984)  
52.215-18 Order of Precedence (Apr 1984)  
52.237-1 Site Visit (Apr 1984)  
52.222-45 Notice of Compensation for Professional Employees  
(Apr 1984)  
52.222-46 Evaluation of Compensation for Professional Employees  
(Apr 1984)

## SECTION M - EVALUATION FACTORS FOR AWARD

### M.1. Contract Award.

- (a) The Government will award a contract resulting from this solicitation to the responsible offeror whose offer conforming to the solicitation will be most advantageous to the Government, cost or price and other factors, specified elsewhere in this solicitation, considered.
- (b) The Government may reject any or all offers, except other than the lowest offer, and waive informalities and minor irregularities in offers received.
- (c) The Government may award a contract on the basis of initial offers received, without discussions. Therefore, each initial offer should contain the offeror's best terms from a cost or price and technical standpoint.
- (d) The Government may accept any item or group of items of an offer, unless the offeror qualifies the offer by specific limitations. Unless otherwise provided in the Schedule, offers may be submitted for quantities less than those specified. The Government reserves the right to make an award on any item for a quantity less than the quantity offered, at the unit cost or prices offered, unless the offeror specifies otherwise in the offer.
- (e) A written award or acceptance of offer mailed or otherwise furnished to the successful offeror with the time for acceptance specified in the offer shall result in a binding contract without further action by either party. Before the offer's specified expiration time, the Government may accept an offer (or part of an offer, as provided in paragraph (d) above), whether or not there are negotiations after its receipt, unless a written notice of withdrawal is received before award. Negotiations conducted after receipt of an offer do not constitute a rejection or counteroffer by the Government.
- (f) Neither financial data submitted with an offer, nor representations concerning facilities or financing, will form a part of the resulting contract. However, if the resulting contract contains a clause providing for price reduction for defective cost or pricing data, the contract price will be subject to reduction if cost or pricing data furnished is incomplete, inaccurate, or not current.

### M.2. Evaluation Criteria/Method of Award

Proposals will be evaluated and the prospective Contractor will be selected based principally on the criteria outlined in M.2.1 and M.2.2 below.

Information relevant to these criteria may be presented within the normal format of your proposal in response to this RFP. Consideration for contract award will be limited to those offerors falling within a

competitive range from technical and cost standpoints. The technical criteria are presented by major category, with relative order of importance indicated by approximate weighting, so that offerors will know which areas require emphasis in the preparation of proposals.

The criteria presented below have been tailored to the requirements of this particular solicitation. Offerors should note that these criteria (a) serve as the standard against which all technical proposals will be evaluated and (b) serve to identify the significant matters which offerors should address in their technical proposals. (Please see Part IV Section L, "Instructions for Preparation of Technical Proposal.")

The evaluation of acceptable proposals from offerors who are found responsible will be conducted in accordance with the evaluation criteria presented herein.

The evaluation of proposals shall be based on a point system (110 points maximum) consisting of two parts: (1) a cost evaluation (20 points maximum), and (2) a technical evaluation (90) points maximum).

The award will be made to the offeror receiving the highest total number of evaluation points, with available funding and other factors considered.

#### M.2.1 Cost Evaluation (20) points maximum)

The proposal offering the lowest evaluated cost for the system, all factors considered, will receive the maximum of 20 evaluation points.

Formula for calculating cost points:

The proposal receiving the lowest cost shall be awarded the maximum of 20 points.

Proposals offering higher evaluated costs shall receive proportionally fewer evaluation points (rounded to two decimal places) in accordance with the following formula:

Points assigned to offers  
with higher evaluated costs =  $\frac{\text{lowest evaluated offer}}{\text{higher evaluated offer}}$

EXAMPLE:

Lowest evaluated cost offer = \$25  
Higher evaluated cost offer = \$30

Therefore:

$\frac{\$25}{\$30} = 0.83$  and

$0.83 \times 20 = 16.60$  evaluation points

**M.2.2 Technical Evaluation (90 points maximum)**

The Government will evaluate each offeror's proposed system for the quality of satisfying the Government's technical requirements contained in Section C.

Offerors shall, in their proposal, respond with sufficient information so that the Government can perform the technical evaluation.

In addition, information and observations obtained during any operational validation or from other sources will be considered in the technical evaluation.

1. Commercial Availability/Reliability of Proposed Systems	40
2. Quality of Specification/Technical Approach	20
3. Training Plan	10
4. Contractor Qualifications	10
5. Project Organization/Management and Conformance to the RFP	<u>10</u>
	90

Calculation of the technical points:

- a. Points will be awarded for each separate technical item.
- b. Points will not exceed the maximum for any individual item; therefore, the maximum points any one vendor can receive is 90.

**EXAMPLE:**

Commercial Availability/Reliability of Proposed Systems	32
Quality of Specifications/Technical Approach	14
Training Plan	9
Contractor Qualification	10
Project Organization/Management and Conformance to the RFP	<u>10</u>
	75