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5. Author(s)
1. Cullivan, Donald E.
2. Austin, John H
3.

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RECOMMENDATIONS FOR IMPLEMENTATION OF

COMMUNITY WATER SUPPLY AND SEWERAGE IMPROVEMENTS

JAMAICA SHELTER AND URBAN SERVICES PROGRAM

532-HG-013

FOR
USAID: REGIONAL HOUSING AND URBAN DEVELOPMENT OFFICE
AND
NATIONAL WATER COMMISSION

6 April 1989

Prepared By

Donald E. Cullivan
and
John H. Austin

Under WASH Task No. 018

Water and Sanitation for Health Project
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FIGURE

NWC Activities under HG 013 Program: First Year Schedule 53

ACRONYMS

CBD	Commerce Business Daily
CDB	Caribbean Development Bank
CDM	Camp Dresser & McKee Inc
CECL	Carib Engineering Corp. Ltd.
EEC	European Economic Community
GOJ	Government of Jamaica
HRP	Hurricane Reconstruction Project
IBRD	International Bank for Reconstruction and Development (World Bank)
IDB	Inter-American Development Bank
IQC	Indefinite Quantity Contract
JNIC	Jamaica National Investment Co. Ltd.
KSAC	Kingston St. Andrews Corporation
KWC	Kingston Water Commission
MOC/H	Ministry of Construction/Housing
MOLG	Ministry of Local Government
MPUT	Ministry of Public Utilities and Transport
NWA	National Water Authority
NWC	National Water Commission
OECF	Overseas Economic Cooperation Fund (Japan)
O&M	Operations and Maintenance
PAHO	Pan American Health Organization
PWA	Price Waterhouse Associates, Jamaica
RHUDO	Regional Housing and Urban Development Office (USAID)
TA	Technical Assistance
UDC	Urban Development Corporation
UNICEF	United Nations Children's Fund
USAID	U.S. Agency for International Development
WASH	Water and Sanitation for Health Project
WHO	World Health Organization

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The authors appreciated the open doors that greeted them at the offices of the National Water Commission. The frank comments received from everyone provided much more useful information than could normally be expected in such a brief visit.

Particular thanks are due E.G. Hunter, Special Assistant to Managing Director Jerry Thomas, and to Karl Bennett, Deputy Managing Director for Engineering, both of whom gave freely of their time and knowledge.

Useful insights were also provided by many people in the private sector, who are now serving or have formerly served the NWC as consultants or as officers.

USAID and RHUDO staff were helpful in providing relevant reports, in suggesting useful contacts, and in offering guidance in all steps of the work. George Deikun, the RHUDO officer in charge of this project, and Charlie Mathews, USAID Chief Engineer, warrant special note for all their help.

EXECUTIVE SUMMARY

At the request of the U.S. Agency for International Development (USAID) Mission in Jamaica, the Water and Sanitation for Health Project (WASH) sent a two-person team to Kingston in January 1989 to assist USAID's Regional Housing and Urban Development Office (RHUDO). RHUDO requested assistance in the preparation of recommendations for the water and sanitation aspects of the recently authorized Jamaica Shelter and Urban Services Program (532-HG-013) to be implemented by RHUDO and the National Water Commission.

The following is a summary of the consultants' findings, conclusions, and recommendations.

FINDINGS

The National Water Commission has been in existence for less than ten years. At about the point it seemed to be in a position to assimilate the duties of the previously separate Kingston and national water utilities from which it was formed, it was also given full responsibility for the operation and maintenance of all the Parish systems in the country (in 1985).

NWC has tried to meet these heavy responsibilities while being chronically under-funded and never having all the skilled people it needs. Not surprisingly, then, the NWC is generally not regarded as an effective water utility by outsiders or even by many within NWC.

The root of NWC's problems, however, lies in its present institutional structure which limits its ability to operate efficiently.

Some of NWC's key problems include the following.

- There are insufficient numbers of qualified management and technical personnel and it is difficult to retain qualified staff.

- Revenue is poorly managed, with unacceptably high receivables and most accounts in arrears,

- The amount of unaccounted for water is far too high.

- Project performance monitoring and reporting are inadequate for a utility of NWC's size.

- There is no effective long range planning for development projects or capital investments.

The creation of the Carib Engineering Corporation, Ltd. (CECL) in 1983 resulted in a transfer of responsibilities from NWC which is not in the overall best interests of Jamaica.

The HG-013 water and sewer projects are supportive of the Shelter Program's objectives and NWC's identification of current critical needs. Institutional strengthening was foreseen as one critical need and is a focus of the technical assistance program associated with HG-013.

There is a widespread awareness within NWC of the need for institutional strengthening and the desire to see it take place.

CONCLUSIONS

NWC can implement the HG-013 water and sewer projects but it will require significant technical assistance and support to do so.

With improved revenue management, NWC could come much closer to financial self sufficiency.

NWC should improve its efforts at developing:

- low-cost non-sewered sanitation systems,

- lower-cost systems for making sewer connections to houses with soakaway pits, and

- acceptable means of providing water for those for whom standard connections are not feasible.

NWC should not limit its efforts at reducing unaccounted-for water to addressing only leakage. Other factors may be even more important.

Success in making NWC a functional, cost-effective water and wastewater utility requires a commitment from the central government.

NWC is unlikely to make significant progress in overcoming the problems described above until it becomes a stronger institution in terms of having greater autonomy and control over its personnel.

RECOMMENDATIONS

For Project Implementation:

For detailed recommendations, see the following Sections:

Description	Section
Technical Assistance	2.2.1
Water Revolving Fund	2.4.4
Sewer Revolving Fund	2.5.5
Water Loss Reduction	2.6.3
Communal Water Systems	2.7.3
Policy for Off-Site Works	2.8.3
Small Water Schemes	2.9.3

Technical Assistance Recommendations

- Provide three senior Jamaican managers to work within the NWC structure to help NWC in the implementation of this project.

- Contract with two U.S./Jamaican consultants: one to assist in the water-loss reduction project and the other in the communal water schemes project.

- Contract with two Jamaican consultants (1) to develop the details of setting up the revolving funds and (2) to provide engineering for off-site works.

Water Connection Revolving Fund

Set up a fund with J$2.4 million to provide for loans for 2,000 connections per year. Loans to be repaid in three years at a monthly cost of J$19.

Sewer Connection Revolving Fund

Set up a fund with J$4.2 million to provide for loans for 300 connections per year. Loans to be repaid in ten years at a monthly cost of J$85.

Water Loss Reduction/Leak Detection and Repair

With guidance and training from a U.S./Jamaican consultant, and the procurement of vehicles and equipment, carry out a four-phase program in Kingston/St. Andrews, Portmore, Montego Bay, and Negril.

- Phase 1: Repair all visible leaks with the assistance of a local contractor.

- Phase 2: Train NWC crews to conduct leak detection studies repair leaks when identified.

- Phase 3: Train selected plumbing contractors in the detection and repair of leaks on private property.

- Phase 4: Identify NWC's old, leak-prone water mains as candidates for possible replacement.

Communal Water Systems

- With assistance from a U.S./Jamaican consultant, evaluate and select promising communal water systems with cost recovery as a requirement.

- Construct and pilot test selected alternatives and recommend which should be adopted for widespread use.

Policy for Funding Off-Site Water Facilities

- Suggest that costs be shared three ways:

  - developer (Ministry of Construction/Housing --MOC/H) pays 30 percent,
  - landowner pays 20 percent, and
  - NWC pays 50 percent.

- This policy to apply only for low-income housing developments. Developer/landowners should pay full costs for commercial developments.

Small Water Schemes

- NWC should proceed with the design and tendering of the schemes with its own resources.

- No outside technical assistance will be needed.

For Institutional Development:

Short-term institutional strengthening proposed to help NWC implement these projects is summarized under "Technical Assistance Recommendations," above. Additional details are presented in Section 3.2.3.

- Recommendations for long-term institutional strengthening of the NWC are presented as follows.

  - Consider returning CECL's functions to NWC as soon as it appears feasible.

  - Initiate a dialogue between the U.S. Government and the Government of Jamaica (GOJ) relative to the "Conditions Required for Changes to Occur" (Section 3.3.2).

  - Conduct a formal institutional assessment of the NWC (Section 3.3.3) and a follow-up workshop to identify feasible remedial actions.

  - Defer implementation of major remedial actions pending clarification of the extent to which external changes are being made.

Chapter 1

INTRODUCTION

1.1 Background

The Regional Housing and Urban Development Office (RHUDO) of the United States Agency for International Development (USAID) has established the Jamaica Shelter and Urban Services Policy Program (hereafter referred to as the Program) to promote wider sharing of the benefits of growth in Jamaica. The purpose of the Program is to produce a self-sustaining delivery system for shelter, water, sewerage, and other urban services to meet the needs of the urban poor.

The water and sewerage components of the Program are to be implemented primarily by the National Water Commission (NWC) of Jamaica, which will act as executing agency for those components of the Program and collaborate closely with the Ministry of Construction/Housing (MOC/H) and the Urban Development Corporation (UDC) as traditional co-providers of infrastructure services as part of shelter development. The Water and Sanitation for Health Project (WASH) was requested to provide advisory services to USAID and NWC by preparing guidelines for implementation.

1.2 Policy Objectives for Water and Sewerage

1.2.1 Overall Policy Objective

The overall objective is to significantly expand access to water and sewerage to the poor on an affordable basis.

1.2.2 Specific Policy Objectives

The specific policy objectives for water and sewerage are set forth in detail in the Program's "Sector Approval Document" and are summarized below.

- Enhance water availability to low-income settlements.
- Improve water management and reduce unaccounted-for water usage.
- Reduce the cost of sanitation and establish policies for extending sewerage service.
- Develop an investment program for water supply and sanitation.

During the first year, implementation will focus on the first three of the above objectives.

1.3 Perceived Constraints to Implementation

The barriers to achievement of the Overall Policy Objective stated in Section 1.2.1 are described in the Program Sector Approval Document. The critical constraints are as follows:

- inadequacies in the institutional capacity of the NWC to implement the water and sewerage components of the Program,
- pricing and investment policies which restrict expansion of water and sewerage services to the poor, and
- extent of water losses in the system.

1.4 Scope of Work

The Scope of Work for the Preparation of this report was set forth in a cable dated 12 December 1988 from USAID/Jamaica to AID/Washington, which is attached as Appendix A. RHUDO and WASH personnel discussed the scope of work and agreed on its interpretation.

1.4.1 Principal Elements of the Scope of Work

The principal elements of the Scope of Work include:

- implementation of specific water and wastewater projects
  - revolving fund for water connections,
  - revolving fund for sewer connections,
  - improvement of water management/leakage reduction,
  - provision of cost-recoverable communal water systems.
  - construction of off-site water facilities, and
  - construction of small water schemes;
- evaluation of NWC institutional capacity;
- development of reporting systems;
- evaluation of NWC capital investments; and
- preparation of a report.

1.4.2 Time Period for Report

The request for services was cabled on 12 December 1988. Services began on 23 January 1989. The draft report was submitted on 14 February 1989. The WASH services comprised five person-weeks in Jamaica, and one in Washington, D.C.

Chapter 2

IMPLEMENTATION OF SELECTED PROJECTS

2.1 Overview of Selected Projects

The projects described in this section reflect the policy objectives for the water and sewer components of the Program as set forth in Section 1.2.

These projects were selected jointly by the NWC and USAID and reflect NWC's assessment of areas of critical need.

2.2 Technical Assistance Needs

2.2.1 Preparation of Scopes of Work

Short-term technical assistance is required to prepare scopes of work, position descriptions, and outline contracts and budget estimates for the procurement of specific private sector services recommended in this report.

These scopes of work and the other items above should be developed with the assistance of the NWC and local consultants for budgeting and other inputs requiring local knowledge.

Specific needed services include the preparation of scopes of work, position descriptions, budget outline contracts, and suggested means of procurement for the following positions and contracts:

- Program Manager. Jamaican National, preferably an engineer with management experience, to report directly to the NWC Managing Director, to have principal responsibility within NWC for the satisfactory execution of the six projects described in this chapter, and for the reporting of project performance to the Director and to RHUDO.

- Project Manager: Water Loss Reduction. Jamaican National, engineer, preferably with water utility/leak detection experience, to work with the NWC Director of the Operations and Maintenance Division, to report to the Program Manager and to have principal responsibility within NWC to coordinate the USAID Project funded activities with routine leak detection and repair functions of the O&M Division.

Project Manager: Performance Tracking. Jamaican national, engineer or utility administrator, with experience in micro computer programs for monitoring, tracking, and reporting on project performance, to act as assistant to and to report to the Program Manager, with responsibility for monitoring performance of the other five USAID funded projects and such other duties as the Project Manager may assign. He may be assigned an advisory role in management of revolving funds and in off-site infrastructure development.

Contract for U.S. Consulting Firm with Jamaican Associate, for leakage detection and repair.

Contract for Local Contractor, to operate equipment and provide services for repair of leaks from NWC water mains.

Contract for Local Plumbing Contractors, to receive training and use specialized equipment for leak detection and repair on private property.

Contract for Local Consultant, to establish the details for the water and sewer connection revolving funds, as described in Sections 2.4 and 2.5.

Contract for U.S. Consulting Firm with Jamaican Associate, for preparation of a study and implementation of pilot schemes for alternative communal water systems, as described in Section 2.7.

Contract for Local Consulting Engineer, to review or revise the designs and contract documents for off-site water facilities, and to supervise their construction, as described in Section 2.8.

Where it makes sense to facilitate contract management, several tasks may be combined in a single contract. But where very different time frames or expertise is called for, separate contracts should be written to insure that the right qualified experience is applied to each assignment.

The first three positions would be treated as contract employees of the NWC. These persons should preferably be Jamaicans but could be nationals of other Caribbean countries. An essential element of their qualifications will be their ability to build close and effective relationships with other NWC employees. They would be paid with project funds for a definite limited period of about three years. Their position description must be carefully defined to avoid any sense of separate status which would render their work ineffective.

Over the long term, these positions should become part of NWC's strengthened in-house capability.

Details of the duties for Contracts 4, 5, and 6 are described in Section 2.6.

2.2.2 Identification of Commodities

- In addition to the preparation of scopes of work as described above, technical assistance should also be sought to identify commodities for the detection and repair of leaks.
- The type and quantities of commodities to be identified should be appropriate to the level of effort described in Section 2.6.
- Early identification is suggested in order to ensure that the necessary commodities can be procured and delivered in a timely manner, so that there can be an early start on the repair of visible leaks.

2.3 Land Ownership Criteria for Receiving Water Service

2.3.1 Background

- Proof of land ownership is a complex issue in Jamaica.
- This issue complicates provision of shelter and basic services to Jamaicans, particularly those with low income.

2.3.2 NWC Policy

- Currently, the NWC accepts only formal legal proof of title as evidence of ownership of land.
- Up to now NWC has not provided water or sewer services to plots without such proof.
- The rationale for this policy is that, in case of outstanding amounts due from customers for services rendered, the only sure means of eventual recovery of such amounts is by placing liens upon the customer's land.
- There have been discussions on this subject and, as part of this program, the Government of Jamaica has agreed to a more flexible policy in regard to land ownership.

2.3.3 Other Factors

NWC has no other feasible legal remedy for recovering revenues due it.

The threat and implementation of cutting off service is only marginally effective (subverted by physical reconnection and fear of operating in some zones).

Placing a lien on land is rarely effective: payment to NWC comes only in the event the land is sold.

While not stated, there may be concern that such "official" actions as providing water service to a customer whose title to the land is unclear may solidify the customer's claim to that land.

2.3.4 Summary

Current NWC Policy on strict criteria for proof of land ownership is probably of marginal benefit in terms of helping NWC collect overdue bills.

Current NWC Policy adversely effects the goals of maximizing the provision of water and sanitation services to the poor.

In adopting a more flexible policy, the NWC should not suffer adverse consequences.

2.3.5 Recommendations

The NWC should be instructed by the Ministry of Local Government (MOLG) to accept reduced criteria for proof of land ownership, such as receipts for payment of local taxes for three years (or such other criteria as the GOJ deems appropriate).

In cases where legal title cannot be offered as proof of ownership, the provision of water and sewer connections should be made on a "provisional" basis, subject to disconnection, if an owner with stronger ownership credentials should arise.

In cases where ownership proof is insufficient to sustain a lien and where amounts are owed to NWC for unpaid bills (above a certain amount), the MOC/H should reimburse the NWC for such amounts. (The rationale is that it is the mission of the MOC/H to provide shelter and services to the poor, and the MOC/H, not the NWC, should assume the risks of NWC's acceptance of a lower standard of land ownership proof.)

2.4 Revolving Fund for Water Connections

Objective: To increase the rate of household connections to the NWC water systems by making it easier for the urban poor to pay for such connections.

- The initial target is the low income areas of Kingston and St. Andrews. If successful, the program would be extended island-wide, as funding permits.

- An initial rate of 2,000 connections per year is proposed, which NWC believes it is capable of physically installing.

Discussion

The proposed means of achieving the objective is to establish a revolving fund.

NWC estimates the average cost of a water connection at J$750. This includes a saddle and tap at the water main, a 1/2-inch diameter pipeline from the main to the property line, a covered masonry meter box, and a shut-off valve and meter inside the box.

The customer is responsible for all plumbing costs beyond the meter.

Suggested terms and conditions for making use of the revolving fund are as follows:

- 20 percent initial payment, made at the time of application for a connection (about J$150);

- repayment of the balance (about J$600) in equal monthly payments over three years, with no grace period, at an interest rate of eight percent (monthly payment = J$19); and

- failure to make loan payments should be treated the same as failure to make water use payments, with the customer subject to loss of water service and such other penalties as the NWC may prescribe.

NWC estimates defaults in payments might be as much as 30 percent. Strategies should be devised to reduce the default level, including both public education programs and penalties.

If the program proves successful, NWC should approach other international funding agencies for funds to expand the program.

Affordability

- NWC estimates that water use charges for the target households would be about J$54/month. This is based on six persons/household using about 6,000 imperial gallons/month (about 33 gpcd) and an average cost of J$9/1,000 gallons.

- The total cost of water per household would then be J$73/month (J$54 for water usage + J$19 for water connection loan repayment).

- The median income for the target population was given as J$18,000/year or J$1,500/month.

- Cost of water would then represent 4.9 percent of income.

Implementation Recommendations

- NWC should engage a local private sector consultant, using the Technical Assistance described in Section 2.2.1, to establish the details of the revolving fund, including:

  - application procedures,
  - publicity about the program,
  - billing and collection procedures, and
  - monitoring and reporting procedures.

- Responsibility for the management and control of the Fund should be assigned to the NWC Commercial Operations Division.

- The installation of the water connections would continue to be the responsibility of the NWC Operations and Maintenance Division.

Potential Constraints

- Failure to relax the current NWC criteria for proof of land ownership could limit the utilization of the revolving fund by those households which are the primary targets of the program.

- A significant increase in the current connection installation rate could strain NWC's capacity.

- An unacceptably high percentage of defaults in repayment could reduce the amount of funds available for subsequent loans.

Funding

J$2,400,000 (loan)	For 2 years (4,000 connections at J$600 each)
300,000 (TA)	Budget for local consultant (Contract 7)

2.5 Revolving Fund for Sewer Connections

Objective: To encourage household sewer connections where street sewers have been built but the rate of making connections is slow.

- The initial target is some 1,700 houses in the New Haven and Patrick City areas of West Kingston.

Discussion

Sewers were constructed a few years ago but only 15 percent of potential customers have connected.

Principal impediment to making connections is the high cost: J$7,000 and up.

Groundwater and soil conditions are said to be unfavorable for effective operation of the soakaway pits, requiring frequent pumping out from pits at a cost of over J$100.

The situation is compounded by the fact that many residents are renters, so owners are not directly inconvenienced by this situation.

During a site visit the neighborhoods generally appeared to have mixed income homes and higher rental rate properties.

Review of NWC connection requirement details indicates that current standards are strict and that significant cost reductions are not likely if these standards are maintained.

NWC engineers believe cost reductions of only 15 percent could be achieved with large-scale installation of connections.

Sewer connections require the preparation of detailed plans by approved plumbing contractors who are engaged and paid by the home owner.

These contractors obtain the necessary approvals from the NWC and the Ministry of Health. These approvals may include the construction of several masonry manholes (usually 4 at a minimum), laying new 4" PVC (plastic) pipe, and emptying the pit and filling it with soil. NWC inspects the work done.

All costs are paid by the home owner to the private contractor, except for an applications fee paid to NWC.

The entire process from application to final hook-up is said to be very time consuming.

The proposed means of achieving the objective is to establish a revolving fund.

Suggested terms and conditions for making use of the revolving fund are as follows.

- The maximum amount to be borrowed would be the amount of the contractor's estimate or J$7,000, whichever is less.

- To justify the loan, the customer would have to give the NWC a copy of the contractors' cost estimate.

- Any costs above J$7,000 would be paid directly to the contractor by the customer.

- Repayment of the loan would be made in equal monthly payments over a period of ten years, with no grace period, at an interest rate of eight percent.

- For a J$7,000 loan, the monthly payments would be J$85.

- Failure to make loan payments would make the customer subject to the loss of water service and a lien on the property.

Affordability

Sewer use charges are currently 45 percent of the water use charge. Using the average water use charge developed in Section 2.4, the average sewer use charge would be about J$24/month. Sewer loan repayment plus the use charge would be J$109, or 7.2 percent of the target population income of J$1,500/month.

Total water and sewer payments would be over 10 percent, or twice the WHO guideline for measuring affordability.

Comments

The NWC's desire to significantly increase the number of sewer connections in New Haven and Patrick City is rational from the viewpoint of health and economics (more effective use of existing facilities).

- The high costs give rise to concern about the viability of the project.

- Over the longer term, steps should be taken to reduce the cost of sewer connections.

- Consideration should also be given to establishing new regulations requiring that connections be made to street sewers within a given time period (say one year), on the basis of health factors.

- For the initial target area, NWC should encourage owners to take advantage of the sewer revolving fund by limiting this opportunity to a two-year period.

Implementation Recommendations

- Utilize the services of the same private sector consultant referred to in Section 2.4 to establish the details of the revolving fund.

- Assign responsibility for managing the fund to the NWC Commercial Operations Division.

- Limit the use of the Fund to a period of two years, for owners in New Haven and Patrick City, in order to encourage owners to take advantage of this opportunity instead of putting it off.

- Allow any NWC customer to utilize the fund while reimbursement under the Program will be only for low income groups (those families with incomes below the median).

- Initiate a study within NWC to reduce the cost of making sewer connections.

- Investigate practices in Florida, where houses are also built on slab foundations, for changing from an "on-lot" disposal system in the back of the house to a discharge to a new sewer at the front (consider "twinning" arrangements as a means of obtaining such information).

- Consider the preparation of a request to USAID for technical assistance for the development and pilot testing of potentially feasible systems for reducing the cost of sewer connections.

Potential Constraints

- The high cost of sewer connections for designs as currently proposed, even when spread over ten years, gives rise to concern about the number of owners who will take advantage of

the loan funds, a concern that requires looking at cost reduction alternatives.

- The high percentage of renters and absentee owners may adversely affect the incentive to make connections.

Funding

J$4,200,000 (loan)	For 2 years (600 connections at J$7,00 each)
200,000 (TA)	Budget for NWC expenses related to twinning and studies on reducing costs.
	(Budget for local consultant--Contract 7--included in funding in Section 2.4)

2.6 Water Loss Reduction

Objective: To reduce the unaccounted for water between source production and water used by customers.

- The initial target is to identify and repair leakage in the areas of:

  - Kingston and St. Andrews,
  - Portmore,
  - Montego Bay, and
  - Negril.

Discussion

- Overall levels of unaccounted for water range from 25 percent to 45 percent. Since there is no current means of measuring water from most production sources, these estimates can only be considered guesses.

- USAID has funded the purchase of master meters for the largest sources. The meters have been procured but not yet delivered and installed.

- While not a part of this program, accurate and effective metering of production sources should move forward rapidly since it is essential to measuring the performance of this program's accomplishments. There are some 970 separate water systems under NWC's direction. About 25 of those are served by relatively large water treatment plants.

- Leak detection and repair is important for the following reasons.

- Failure to repair visible leaks leads people to believe that NWC is not an effective organization.

- The economic cost of leakage is not only the J$14 per 1,000 gallons produced but the damage to roads and property.

- It is much more economical to gain water by reducing leakage than to construct new sources.

It is unlikely that leakage is the largest factor contributing to unaccounted for water. A 1979 leakage study in Kingston reportedly found leakage to be in the order of ten percent of water produced, a result not inconsistent with studies in other large cities,

Ineffective customer metering, illegal connections, unrecorded usage by government and other public buildings, and unmetered wastage are frequent causes of high levels of unaccounted for water. These areas should be future targets by NWC for loss reduction.

The result of the leak detection study financed by Inter-American Development Bank (IDB) in Mandeville should be studied to provide guidance for this program.

This one-month Mandeville project has just started and involves training of NWC staff by specialists of the Thames Water Authority (U.K.).

The principal impediments to progress by NWC leakage crews are (1) lack of transport, (2) lack of excavation equipment, and (3) inadequate supplies of repair materials.

A contributing factor to the extent of leakage is the deterioration of old water mains. Some mains installed over 40 years ago cannot be repaired effectively and should be replaced.

The NWC believes that leakage from the customer's plumbing system, after the meter, may be a significant factor in complaints about high meter readings.

NWC wants to address private plumbing leakage without itself becoming involved in detection and repair on private property.

Review of the situation suggests that efforts in the four target cities be divided into four phases:

- Repair visible leaks as an immediate program.

- Develop leak detection skills and pursue repairs as a routine, ongoing effort.

- Pursue the problem of private property leakage.

- Develop a program for the identification and replacement of water mains which have exceeded their useful life.

Implementation Recommendations

- The NWC, with the assistance of USAID and the Technical Assistance described in Section 2.2.2, should move for early procurement of commodities related to repair of visible leaks.

- These commodities should be identified as soon as possible. A preliminary list of the numbers and type of repair commodities to be considered follows:

  - Heavy Equipment:
    5 units; medium duty, combination backhoe and front-end loader, mobile/rubber tires

  - Vehicles:
    5 each; 4-5 c.y. dump trucks
    5 each; Double cab pickup trucks
    5 each; Heavy duty, 4 wheel drive pick up trucks
    5 each; Van trucks, with shelving for tools & parts
    5 each; 4-door sedans, for supervisors

  - Air Compressors/Jack Hammers
    5 units; trailer mounted, 2 hammers/unit, with hoses, spade bits and parts

  - Repair Materials
    5 sets; selection of clamps, couplings, sleeves, etc. for full range of sizes; plus handtools and spare parts

  - Safety Items
    5 sets; Hard hats, traffic cones, barrier blinkers, etc.

  - Geophone Head Sets
    10 sets: To be used for better targeting of visible leaks where the source is not obvious.

- Full range of leak detection equipment to be a separate procurement.

The commodities are proposed to be financed under USAID Project No. 535-018 for Hurricane Reconstruction Project (HRP) for the following reasons:

- The hurricane greatly exacerbated leakage problems, especially near the surface.

- Reduction of water losses through leak reduction is recognized as a goal of the HRP.

- This objective is complementary to the HG-013 objective of water loss management.

- The HRP funding can be made available relatively rapidly because of its emergency nature.

- The repair of visible leaks has been identified as one of the earliest phases of activity proposed under HG-013.

Commodities are based roughly on two crews for Kingston and one each for the three cities.

NWC, with the concurrence of USAID and the scopes of work described in Section 2.2.1, should move to select and appoint the Program Manager and two Project Managers described as Positions (1), (2), and (3) of that Section.

NWC should also move to engage an experienced leak detection consulting firm (the Consultant) to serve as its chief source of technical assistance in the implementation of this program (Contract 4 of Section 2.2.1).

Consider using some Hurricane Reconstruction Project funds to finance the start-up costs of the Consultant.

The Consultant will be expected to develop and implement a plan for the immediate and long term execution of the four phases of the program. This plan should consider:

<u>Phase 1: Repair of Visible Leaks</u>

- Assist NWC staff in selecting one or more contractors for each target city (Contract 5). The intent would be to lease some of the commodities described above to these contractors and to assign responsibility to the contractors for the operation and maintenance of the equipment. The NWC would direct and control the use of the equipment as its operations require.

- Initial intent would be to establish two repair crews in Kingston and one each in the other three cities.

- Consultant would guide NWC in overall planning and provide specific training to NWC repair crews assigned to this phase of the work.

Phase 2: Develop NWC Leak Detection Capability

As part of its contract, the Consultant will purchase and import six sets of leakage detection equipment and provide training for a two year period to two crews in Kingston and one each in the other cities. Consultant will also carry out leak detection surveys in all four cities, and prepare reports summarizing results and making recommendations for future programs.

Phase 3: Train Private Contractors for House Leakage

- As part of its contract, the Consultant will purchase and import 12 sets of specialized leak detection equipment for leakage on private property.

- With NWC assistance, select ten plumbing contractors from among those expressing interest in the program: four in Kingston, two each in the other cities.

- Lease the equipment to the contractors and conduct training programs in all four cities to train the contractors in its use.

- Develop a program for advising the public of the availability of these private sector leak detection skills.

- Develop a suggested basis of charges for such services.

- Periodically monitor the work of these contractors to assess the effectiveness of the program, including data on cost of surveys and repairs, and the extent of leakage found.

Phase 4: Identify Mains to be Replaced

- Work with NWC engineering staff in locating and identifying those water mains most likely, because of age and type of materials, to be at or near the end of their useful life.

- Develop a program of suggested priority for gradual replacement of failure-prone mains, together with an estimate of the cost of replacement.

- NWC should identify those employees to be assigned to the Consultant for training under Phase 1 and 2, ensure that they have the necessary qualifications and that they are available to work solely with the Consultant on schedules jointly developed by the Consultant and NWC.

- Leak detection and repair activities cannot be scheduled to follow normal working hours. NWC staff assigned to work on these activities should be given some form of benefit consideration, as part of this program, to compensate for the expected requirement of working off hours.

- NWC, the Consultant, and the Project Manager for Water Loss Reduction should, at the start of the program, develop a clear understanding of their mutual responsibilities for leakage detection and repair. They should then meet periodically (at least monthly) to review these relationships.

- NWC should appoint a member of its staff to act as the counterpart to the Consultant's Project Manager. This counterpart could be the new NWC Project Manager for Water Loss Reduction or a senior member of its O&M Division.

Potential Constraints

- ability of NWC to provide staff sufficiently capable and motivated to meet the needs of the program,

- access to "red zones" to conduct leak detection and repair activities, and

- difficulty in obtaining information about old water mains in the system.

Funding

The following budgeting allocations correspond to programs estimated to require no more than two to three years.

J$5,500,000 (TA)	Budget for Consultant (Services Only) (HG-013 and HRP)
5,500,000 (HRP)	Budget for Repair Commodities (HRP)
1,500,000 (Loan)	Budget for Detection Equipment
1,000,000 (TA)	Budget for NWC Managers
1,500,000 (Loan)	Budget for Repair Contractors

2.7 Communal Water Systems

Objective: To provide water to the urban poor where household piped systems are too expensive or where supplies are limited, and to do this by means of cost-recoverable communal systems.

- The intent is to test alternative systems to determine those most suitable for Jamaica.

Discussion

Standpipes are the principal means used in Jamaica today to provide water communally in urban areas.

- Most existing standpipe installations are considered unsatisfactory for the following reasons.

  - They tend to be vandalized early on.
  - Present methods encourage wastage.
  - Costs are not recovered.
  - Areas around them are muddy and unclean.
  - They sometimes attract squatters who illegally tap their feeder lines which reduces flow.

- NWC Board's current thinking is to discourage the construction of new standpipes.

- NWC should be taking a broader look at communal water system alternatives.

The 1987 study by McLeod[1] covered 677 households in 42 low income neighborhoods of Kingston. No attempt was made to identify possible illegal connections, and it is not clear whether the study includes squatter settlements. Nevertheless,

[1]McLeod, Ruth, Low Income Strategies in Kingston, Jamaica: Solutions of the Informal Sector. Construction Resource and Development Center, prepared for RHUDO, USAID/Jamaica, December 1987.

the survey results are useful in considering patterns of urban water supply. Sources of water for the households in the study were as follows:

Source of Water	Percentage of Households
Piped into the house	55.2
Piped into the yard	34.6
Public standpipe	4.7
Obtained from neighbor	3.2
From commercial buildings	1.5
Other	0.8
Total	100.0

- McLeod identified three areas of Kingston where standpipes were the source of water for more than 30 percent of the households:

  - Hope Tavern,
  - Riverton City, and
  - Causeway.

- Areas such as this might be considered targets for possible pilot programs for upgrading communal water systems, along with similar areas in other parts of the country

Implementation Recommendations

- NWC, with the concurrence of USAID and the use of the scope of work described in Section 2.2.1, should engage a consulting firm with experience in communal water systems (Contract 8 of Section 2.2.1).

- The duties of the Consultant should be as follows.

  Study (4 Months)

  - Collect data on existing household water sources to assess needs.

  - Study existing standpipe installations.

  - Consider and recommend alternative communal water systems.

  - Develop cost recovery alternatives.

  - Recommend a pilot program with NWC, select the areas to be tested.

Design/Construct (6 months)

- Design those pilot test alternatives approval by NWC and USAID.

- Prepare tender documents and assist NWC in calling for tenders and awarding contracts.

- Supervise the construction of the facilities.

Field Testing (12 months)

- Put cost recovery methods in place.

- Monitor performance of test installations.

- Recommend which alternative(s) should be pursued on a larger scale.

- The study of alternatives should include such systems as:

  - improved standpipe installations,
  - vendor/carrier systems of delivery,
  - use of small diameter street mains and yard faucets, and
  - other systems as appropriate for Jamaica.

- NWC should assist in the collection of data, selection of pilot test areas, and in ensuring access to various locations as required.

Potential Constraints

- NWC Board acceptance of some systems proposed for testing,

- cultural acceptance for some alternatives, and

- acceptance and feasibility of cost recovery systems.

Funding

J$ 1,500,000 (TA)	Budget for Consultant
3,000,000 (Loan)	Budget for Construction of Pilot Test Facilities

2.8 Policy for Funding Off-Site Water Facilities

Objective: To establish a policy for cost recovery of off-site water facilities to be provided by the NWC specifically to serve new housing developments being developed by the Ministry of Construction/Housing (MOC/H).

- The initial target is the Norwood area of Montego Bay where major service sites development is planned and off-site infrastructure for water and sanitation are key constraints to shelter development.

Discussion

- The MOC/H is developing 2,977 lots for low income housing in Norwood.

- To provide water to that site, NWC proposes a pumping station, storage tank and transmission main which will take water from the Martha Brae water system in North Trelawny.

- The cost of these off-site water facilities is estimated at J$9.75 million by NWC.

- Allocation of all these costs to the development would increase the cost of each lot by J$3,300. MOC/H says this would increase the present cost by about 25 percent and put the lots beyond reach of many of those now targeted for ownership.

- While it is NWC's mission to provide water to the people of Jamaica it is under increasing pressure to do so without subsidies.

- Low cost housing is a MOC/H goal and if subsidies for water are needed, they should pay a share of such costs.

- The NWC is required by the World Bank to recover 30 percent of the cost of capital investments (and all of its operating costs) by 1990.

- While a full share of off-site costs may be too great a burden for prospective lot owners to pay, there is no reason why they should not pay some of these costs.

- Taking the above factors into account, a suggested future policy for sharing off-site utility cost is as follows.

  - Require 20 percent of the cost to be paid by the landowners (J$660 is less than the price of an average water connection).

- Require 30 percent of the cost to be paid by the MOC/H (as their share of the subsidy for low income housing).

- Require 50 percent of the cost to be paid by the NWC (eventually to be recovered through water use charges).

- This policy is based on the assumption that the off-site works are essentially dedicated to the development they are meant to serve. The percentage might change if NWC plans to make significant use of these facilities to serve other customers.

- For this project, assume that 50 percent of the cost will come from the MOC/H share of the HG-013 loan and 50 percent from NWC's share of that loan. MOC/H can then decide about passing some of these costs on to lot owners.

Implementation Recommendations

- NWC should evaluate the policy recommendation in the previous section, discuss it with USAID, and decide on a position for talks with MOC/H.

- USAID should initiate a policy dialogue with NWC and MOC/H to agree on:

  - a standardized policy for future cases and
  - a specific agreement for Norwood.

- NWC, using the scope of work developed under Section 2.2.1 for Contract 9, should engage a local consulting engineer to prepare or revise the designs for the Norwood off-site water facilities, and to supervise the tendering and construction of these works.

- A local private sector contractor would then construct the facilities.

- Responsibility for supervision of the design and construction of these facilities should be assigned to the NWC Engineering and Resource Development Division.

Potential Constraints

- Failure of the parties to agree on a policy for sharing costs of off-site works.

Funding

J$4,800,000 (HG-013 Loan; MOC/H)	Budget for Construction (1/2)
4,800,000 (HG-013 Loan; NWC)	Budget for Construction (1/2)
900,000 (TA)	Budget for Engineering (Contract 9)

2.9 Implementation of Small Water Schemes

Objective: To allow the NWC to overcome its backlog of some 20 small water schemes for which capital budgets have been inadequate in recent years.

- The target population is the urban poor in parishes outside Kingston/St. Andrews.

Discussion

- NWC has targeted these schemes as being of critical need but which have had to be postponed because of budget limitations.
- NWC is now developing a list of priority candidate projects within the following guidelines.
  - Project is be outside Kingston/St. Andrews.
  - Maximum cost per scheme is J$1.0 million.
  - Total budget allocation is J$9.0 million.
- NWC will design and tender the works.
- Local contractors will build them.
- No outside technical assistance will be required.

Implementation Recommendations

- NWC should complete its list and submit the schemes to USAID for their information.
- NWC should complete the designs and cost estimates and review them with the Program Manager (Position 1).
- NWC should tender the works and supervise their construction.
- Local contractors should construct the work.
- USAID should provide the funds to the NWC upon receipt of the designs and cost estimates of the schemes.

Potential Constraints

- No serious constraints are foreseen.

Funding

- J$9,000,000 (Loan) Budget for Construction of the Schemes.

Chapter 3

NWC INSTITUTIONAL DEVELOPMENT

3.1 Summary Profile of the NWC

3.1.1 History of the NWC

In a 1983 report, Sterling[2] provided details on the genesis of the National Water Commission, which is summarized below.

- The Kingston Water Commission (KWC) was established in 1936 to serve the water and sewer needs of the metropolitan area (the Kingston St. Andrews Corporation).

- The National Water Authority (NWA) was established in 1963 to serve the water needs of Jamaica outside the Kingston metropolitan area.

- Amalgamation of the two entities was formally proposed in 1969 and took effect with the creation of a new National Water Commission (NWC) by Act of Parliament in September 1980.

- The new NWC was given responsibility "for the production and distribution elements of the major and intermediate schemes" (Sterling), but local authorities in the Parishes retained responsibility "for maintenance of minor water supplies" (Sterling).

- In 1985, the Government of Jamaica (GOJ) directed the NWC to take over full responsibility for water and sewer systems in the Parishes.

- Since its creation, the NWC has alternatively been assigned to the Ministry of Public Utilities and Transport, and the Ministry of Local Government, where it now resides.

3.1.2 The Role of CECL

In the early 1980s the NWC was proceeding with the development of the Yallahs River water scheme. Impatient with the rate of progress on this project of national importance, the GOJ relieved NWC of its responsibility for the Yallahs River Project and assigned it to a new organization, the Carib

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[2] Sterling, Stephen. "A Management Audit of the National Water Commission," Jamaica National Investment Company Limited, March 1983.

Engineering Corp. Ltd. (CECL), created in 1983 for that specific purpose. CECL was given a broad, favorable charter which allowed them to move rapidly:

- bypassing normal GOJ regulations on tendering and award of contracts, and with the

- ability to compensate its employees, in salary and benefits, outside the GOJ restrictions which apply to NWC and most other Government agencies.

These advantages permitted CECL to hasten the completion of the Yallahs River Scheme. This performance led to the institutionalization of CECL from an ad hoc to a relatively permanent entity, to which all large water projects have since been assigned.

CECL has a core staff of some 30 employees, about 90 percent of them attracted from NWC's Engineering and Resource Development Division by the promise of significantly higher pay. CECL makes extensive use of private sector consultants for design, and all construction work is also contracted out.

CECL has a current annual capital budget in the order of J$120 million. Within the past year, the GOJ is said to have tightened CECL's ability to bypass Government rules on contracting. Some observers say the result is that most CECL projects are currently behind schedule.

3.1.3 Current Structure and Staffing of NWC

The current organization of the NWC is essentially as recommended by the "Amalgamation Team" in their report to the NWC in January 1982, with some modifications suggested by later advisors. The NWC structure consists of the following key elements:

- Board Of Directors;

- Managing Director (MD);

- three Deputy Managing Directors (DMD);

  - engineering,
  - finance, and
  - administration;

- eight Divisional Directors;

Reporting relationships for the eight divisions are as follows:

- to the DMD/Engineering

  - Engineering and Resource Development
  - Operations and Maintenance

- To the DMD/Finance

  - Support Services
  - Finance and Accounting

- To the DMD/Administration

  - Administration

- Directly to the MD

  - Commercial Operations
  - Human Resource Development
  - Internal Audit

Information on staffing strengths and skills was not readily obtainable. Overall, NWC is said to have about 3,400 employees, but allocation among divisions was not available. This information should be obtained when possible.

3.1.4 Summary Assessment

Overview

- Section 3.3 describes the activities related to a detailed institutional assessment. Such an assessment was not a part of the WASH scope of work but some preliminary impressions were obtained which may be useful in considering the need for further actions.

- Discussions with outsiders illustrate that the NWC has a credibility problem in terms of popular expectations of a well-run and effective water authority. There are also frank perceptions from within the NWC about the organization's shortcomings. This awareness, from within, of the need for improvement bodes well for the proposed institutional strengthening program.

Personnel

From many interviews, some patterns developed relative to NWC personnel which are indicators of institutional problems.

- Compensation levels are generally unattractive, possibly in the order of half that of good people in equivalent positions in the private sector.

- Many of the NWC employees the WASH team found impressive were either:

- contract employees, with salaries competitive with the private sector, or

- bonded employees, who were serving time in exchange for earlier financial assistance for their education.

- There is an increasing attrition through the better people moving to private firms, and a corresponding increase in numbers of the less qualified.

- The NWC is under pressure to employ people that might otherwise not be under consideration.

- In general, NWC is overstaffed at the low levels and understaffed at the management and skill positions. Some senior staff complained of a general lack of discipline among the employees.

- Employee morale is undermined by such factors as:

  - NWC's generally unfavorable public image,

  - the "class" conflicts between regular and contract employees,

  - inter-divisional disagreements,

  the generally low levels of compensation for regular employees.

Organization

- There is some indication that the Board is too often involved with relatively minor operational matters instead of looking at broad policy issues.

- There appears to be insufficient direction of the various divisions, with some divisions operating with limited liaison with others.

- Too many Division Directors report directly to the Managing Director.

- The creation of CECL may have made sense at the time of the Yallahs River Project but it is hard to justify its continued existence.

  The only reason it was successful is that it was given powers which NWC does not have.

- It is a drain on NWC's resources and a source of harm to NWC morale.

- The division of responsibility between CECL and NWC has created a vacuum in long term planning.

- The execution of major schemes could just as well be done by establishing special, ad hoc project teams within NWC. They could do the work as well as CECL, if given its powers.

- CECL is the sort of ad hoc response that undermines institution building.

Revenue Management

- Collection of revenue is the life blood of a water and sewer utility, but it is a serious problem at NWC.

- Accounts receivable are now over J$200 million. Theoretical monthly revenue is in the order of J$33 million, but only about J$23 million is being collected. As a result, the accounts receivable are growing at a rate of J$10 million/ month, or J$120 million /year. This is more than NWC's annual capital budget.

- NWC has about 250,000 customers island-wide, about 76,000 of whom are in Kingston.

- Of some 76,000 accounts, 87 percent or 66,000 are in arrears.

- About 68,000 (89 percent) of these are metered, but only 40-50,000 of these meters are operative. As a result, only 55-65 percent of the accounts are equipped with operative meters.

- The normal power of a water utility to enforce revenue collection is the threat of loss of service. NWC has been unable to use that power effectively for the following reasons.

  - Insufficient staff and vehicles are available to physically disconnect all those in arrears.

  - It is physically unsafe for NWC staff to enter some areas.

  - It is relatively easy for customers to reconnect illegally (and there is little policing of such activities).

There is a general reluctance to cut off water because of health and sanitation. Many people know that, and take advantage of it.

For the most part, the threat of loss of service seems to work with NWC's clients who are used to functioning with formal sector institutions and are probably more middle income.

- Meters are the basis of most of the revenue. Meter installation and maintenance is the responsibility of the Operation and Maintenance Division while revenue collection is the role of the Commercial Operations Division. This situation could benefit from a closer look at their relative needs and interests.

General

- Integration of the Parish systems has not been smooth. Water schemes in the Parishes were developed largely as social measures, with economics taking second place. As a result, local people now tend to resist cost recovery measures.

- Data of the most basic type are hard to come by within NWC.

- Rational planning of water schemes is complicated by the fact that the Members of Parliament (there are 60 MPs) each control the allocation of J$500,000 per year for public works (including water). If half that is spent on water projects (not an unrealistic assumption), that amounts to J$15 million/year, or 15-20 percent of NWC's recent capital works budgets.

- Under-funding and lack of vehicles and equipment are serious impediments to many NWC operations.

- No division seems to have responsibility for standpipes or communal water systems.

- NWC's public relations services are provided by a private sector contractor.

- In commenting on autonomy, the Managing Director said: "The Government's priority is to meet social needs. NWC's is to provide water and recover our costs." He added that 20 percent of NWC's work was done to meet the Government's requests for projects not in NWC's priority program.

- Project performance monitoring and reporting and internal reporting seem to be areas requiring considerable strengthening.

3.2 NWC Capacity for Project Implementation

3.2.1 General

The Shelter Program (HG-013) Sector Approval Document saw NWC's capacity to implement the six projects described in Chapter 2 as a potential constraint. USAID recognized that NWC was in need of long-term institutional strengthening, but requested WASH to address the issue of what sort of immediate support could be provided to allow NWC to act effectively as the implementing agency for the water and sewerage components of the Shelter Program. Some of the immediate problems which might inhibit NWC's ability to execute these projects are as follows.

- The projects cut across divisional lines, and interdivisional coordination needs improvement.
- The ability to design and execute projects has been weakened by the creation of CECL.
- Present senior staff are stretched thin and are not in the best position to undertake a large new program such as this.
- Lack of vehicles and equipment hinders the execution of routine tasks.
- Systems for monitoring and reporting on performance of projects are inadequate for the needs of this program.

3.2.2 Types of Support Needed

Most of the work associated with the six projects is not new to NWC, and, given time, NWC could probably do a creditable job in executing most of this work without extensive external support. NWC would be much better equipped for this task, however, with strengthening in such areas as:

- increasing the number of skilled managers within NWC.
- appointing someone as Program Manager whose sole responsibility is to follow and direct the six projects. (This manager should be given authority by the Managing Director to co-ordinate the work of all divisions as the program may require.)
- providing the necessary vehicles, equipment, and funding.
- utilizing private sector consultants in specialized areas, such as leak detection, where the NWC has inadequate experience or insufficient resources to complete the services in accordance with the programs schedule.

- developing a computerized system for monitoring and reporting on project performance.

- providing training to NWC staff to increase their capability to carry out projects in the future, on a sustained basis, with decreasing amounts of external support.

3.2.3 Specific Strengthening Activities for Each Project

Specific strengthening activities for each project include the following (for details, refer to proposed technical assistance in Section 2.2.):

- provision by USAID of preproject technical assistance in preparing scopes of work and outline contracts for the position and contracts described in this section,

- assignment of a Program Manager (Position 1) for overall direction of the six projects,

- assignment of a Project Manager (Position 3) as an assistant to the Program Manager, for tracking and reporting on the performance of all the projects, and

- funding for the above activities for a period of 2-3 years, with the eventual goal of incorporating these skills in NWC's permanent staff.

<u>Revolving Funds for Water and Sewer Connections</u>

- engagement of a local Consultant (Contract 7) to set up all the details necessary for the establishment and operation of these funds and

- provision of funds for the establishment of these revolving funds.

<u>Water Loss Reduction</u>

- assignment of a Project Manager (Position 2) for the specific direction of the water loss reduction project,

- procurement of commodities for leak repair essentially as described in Section 2.6,

- engagement of a joint-venture, U.S./Jamaican leak detection and repair consulting firm (Contract 4), whose duties are described in Section 2.6 (As part of this contract, the consultant will procure leakage detection equipment which will become the property of the NWC.),

- engagement of local contractors (Contract 5) to assist NWC in the repair of leaks from NWC mains,

- agreement with local plumbers (Contract 6) to provide services to customers for the detection and repair of leaks on their own property,

- provision of incentives to NWC staff who qualify because of the nature of their duties in conjunction with leak detection and repair activities, and

- Funding for the above.

Communal Water Systems

- engagement of a joint-venture, U.S./Jamaican consulting engineering firm (Contract 8), whose duties are described in Section 2.7.

- provision of funds for the consultant's services and for the construction of pilot communal water systems.

Policy for Funding Off-Site Water Facilities

- provision of USAID assistance in discussing policy issues with MOC/H,

- engagement of a local consulting engineer (Contract 9) to assist NWC in the design, tender, and supervision of construction of the off-site water facilities needed to serve Norwood, and

- funding for the above, and for the cost of constructing Norwood facilities.

Implementation of Small Water Schemes

- advice and support as needed from the Program Manager and Project Manager (Positions 1 and 3) and

- funding for the construction of these schemes.

3.2.4 Potential Additional Strengthening

- Once the program is under way, other methods of providing support to NWC should be investigated. These sources of support are from the public sector, so they cannot be counted upon with certainty at this time.

- Collaboration with other Caribbean water and sewer authorities could be considered, particularly in regard to activities such

as leak detection and repair, communal water systems, low-cost sewer services, and general training programs.

- Collaboration with United States water and sewer authorities should also be considered (preferably some in Florida because of climate and proximity) for similar activities as appropriate (an approach referred to as "twinning").

- The proposed new NWC Program Manager should investigate these public-sector strengthening possibilities, perhaps with short-term technical assistance from USAID, and present a program and cost estimate to USAID for its consideration.

3.3 Long-Term Strengthening of NWC

3.3.1 Characteristics of an Effective Water Authority

- In 1988, WASH developed guidelines to assess the relative strengths and weaknesses of water and wastewater institutions.[3] Those guidelines suggested nine "Performance Categories" which circumscribe the critical areas of institutional functions or attributes of most organizations.

- These Performance Categories and their definitions are included in Appendix C. If a water authority measures well against the characteristics stated or implied in these definitions, it may be considered to be effective.

- Most water and sewer authorities do not measure up well and fail the test of effectiveness. WASH was able to find only a handful of effective organizations in developing countries to serve as models for preparation of its Guidelines.

3.3.2 Conditions Required for Changes to Occur

- NWC has been the recipient of extensive efforts at institutional strengthening, practically from its inception. The World Bank has probably taken the lead in the funding and encouragement of such programs, and many consultants, local and expatriate, have provided generally high quality advice, support and training.

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[3]Cullivan, D., et al. "Guidelines for Institutional Assessment of Water and Wastewater Institutions", WASH Technical Report No. 37, 1988.

- That these efforts have not been as successful as they should have been is probably because the conditions for success have not been put in place.

- Such conditions, which are not easy to bring about, are nevertheless critical to any expectations of significant improvement in NWC's capability to fulfill its mission (the NWC Mission Statement is attached as Appendix D).

Key Pre-Conditions for Change within NWC

- There must be a strong climate for wanting change, such as:

  - pressure from the customers, the media and public interest groups,

  - dissatisfaction from high levels within the government about present conditions, or

  - external pressure form important international funding agencies.

- There must be the will to bring about change by those in the government in a position to make it happen, such as:

  - the Prime Minister or
  - the Minister of Local Government.

- There must be fundamental changes in those elements of NWC's charter which most inhibit its effectiveness, leading to:

  - better control over its employees (hiring, firing, promotion, discipline),

  - more competitive compensation (higher salaries in return for fewer employees, improved benefits), and

  - clarification of the role of the Board of Directors (the Board sets Policy, the Managing Director controls the NWC's operations, and neither tries to do the other's job).

- The following condition is interdependent with the second and third points above.

  Those who control the NWC (the Prime Minister and the Minister of Local Government (MOLG) must be convinced that, in return for making such fundamental changes, the NWC will become an effective, financially sound, well regarded institution within a reasonable period of time, say three to five years. (The probable high political cost of making the changes must be balanced by a

reasonable expectation of a future return. Pragmatically, the best time to take such risks is at the start of a new administration.)

- Individual Board Members must be appointed who will support the newly clarified role of the NWC Board. (Board members support NWC's mission by limiting themselves to policy issues.)

- NWC's Managing Director must meet the highest tests of leadership (see Appendix C). In addition, in the Jamaican context, he should have most or, preferably, all of the following attributes:

  - must be technically sound and have the support of NWC employees (preferably a person with a water utility background), and

  - must have the respect of the Board Members (must be perceived as an equal by Board Members).

3.3.3 Follow-up Steps to Bring About Change

Overview

- The activities discussed in this Section are likely to be successful in proportion to the extent that changes described above have taken place.

- Under the best of conditions, institutional change takes a long time to bring about. Three years would probably be a minimum period. Five years is more realistic and may not be long enough. In fact, effective organizations never stop changing.

- Broadly, the change from an unsatisfactory organization to an effective one goes through three phases:

  - assessment,
  - identification of remedies, and
  - implementation.

Assessment

The need to improve the performance of the NWC as an institution is well recognized as crucial to the success of the sub-elements of the program. To do so requires a careful, systematic, and professional assessment of the agency. Although observed deficiencies of an organization can often appear to be narrowly technical or financial in nature, they frequently reflect a much more fundamental deficiency in terms of how things get done or don't get done in general. Practices essentially organizational and social cut across entire agencies and affect technical and financial matters. The proposed assessment will provide this systematic in-depth review of the NWC and identify measures

that can improve general performance and facilitate and make sustainable the implementation of the technical aspects of the USAID program.

The profile developed from the institutional assessment will lead to a variety of possible improvements. These could range from a long-term (5-10 year) comprehensive institutional development project to short-term specific activities to strengthen one aspect of the institution. The assessment should point to the strengths and weaknesses of the institution and suggest possible solutions. The next step will be to carry out a detailed analysis of what to do about the findings in order to improve the performance of the organization. The assessment could provide a number of outcomes:

- a profile of the strengths and weaknesses of the institution,
- definition of problem areas for the design of improvement activities,
- a baseline for information on certain evaluations,
- a working relationship with organizations concerned with performance improvement, or
- a clear sense of the mix of skills and time required for future action.

To facilitate the assessment of water and sanitation agencies, WASH has developed a set of guidelines ("Guidelines for Institutional Assessment of Water and Wastewater Institutions," WASH Technical Report No. 37, February 1988.) The WASH Guidelines were designed to serve as a step-by-step handbook to help in diagnosing a water/wastewater institution's relative strengths and weaknesses.

- Appendix E provides an overview of the six key steps in the process. For an institution such as NWC, the assessment team would probably consist of two expatriates experienced in the process, and two Jamaican professionals with skills complementary to the expatriates. The procedure would take about three weeks and would cost on the order of U.S. $60,000.
- For an assessment to be useful, it should:
  - be conducted by people outside NWC (for reasons of credibility and because employees are always freer in talking to outsiders),
  - have the enthusiastic support of key NWC people, from the Managing Director on down (An assessment demands a lot of senior people's time, probes deeply into sensitive areas, and will have limited value if the subject of the team's interviews are less than candid about their problems.),

- preferably have the support of an international development agency to serve as sponsor (gives the results of the Assessment greater credibility to NWC's bosses: the Board and the Ministry), and

- be conducted by a competent and tactful team. (There is a clear need for the team to be sensitive, circumspect, and independent, as well as to have appropriate skills and knowledge of the process.)

Identification of Remedies

- The assessment is a diagnosis. It tells what parts need improvement and how much. Hopefully, it will also show what parts are functioning well, or are on their way to acceptability. It does not, however, tell how to bring about the needed improvements.

- Experience has shown that there is a need to be careful about prescribing remedies. A lot of people will be affected by the changes that will be needed to bring about improvements, inside and out of NWC (customers, for example, as well as employees). These interested people are sometimes referred to as "stakeholders." They all have a stake in what's going to happen to NWC.

- WASH has been involved in several efforts of this type. The system that seems to work best is to conduct a workshop[4] (in the institution's home city) which is attended by representatives of all the key stakeholders. The workshop is based on:

  - the results of the assessment, and

  - a preliminary report outlining a range of alternatives for making improvements in areas where weaknesses have been identified. (There are a variety of means by which such a general report can be prepared.)

  Such a workshop is usually developed and conducted by an experienced workshop leader or "facilitator" and water utility institutional specialists.

- The results of the workshop should provide guidance in the direction and the pace of remedial activities.

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[4]Edwards, D., and Pettit, J., "Facilitator Guide for Conducting a Project Start-up Workshop", WASH Technical Report No. 41, 1988.

Implementation

- The extent to which local or expatriate technical assistance may be employed to assist NWC staff in implementing agreed-upon improvements would be subject to:

  - NWC's capability at that time,
  - the views of the NWC Board and MOLG, and
  - the views of any international development agency which may be providing support to NWC.

- Attempts over the past several years to assist in the institutional strengthening of NWC probably would have been more effective if they had followed these steps.

Chapter 4

PROJECT PERFORMANCE MONITORING AND REPORTING

4.1 Existing Systems

4.1.1 Systems in Effect

Information on monitoring and reporting project performance was not readily available. From discussions with staff and NWC consultants it appears that current systems probably would not be suitable for this project. Most reporting is now done manually.

4.1.2 Systems Under Development

Price Waterhouse Associates Jamaica (PWA) is in the process of developing a computerized management information system (MIS) for NWC and has recently prepared a request for proposal for software vendors in conjunction with the proposed system.

PWA's proposed MIS project entails computerization of operations in three main areas:

- financial and inventory management,
- personnel management, and
- operations management.

PWA has prepared a draft report which presents the detailed specifications for these three areas. The operations management area includes:

- operations and maintenance,
- construction and engineering, and
- vehicles and equipment.

The proposed hardware includes PC LANs (personal computer local area networks), work stations, and printers connected to a DEC/VAX multiple CPU cluster installed at an external data processing facility.

4.2 Reporting System Needs for This Program

4.2.1 Differing Needs of Each Project

This project consists of six sub-projects. Except for the two revolving funds, they are quite different from one another. As a consequence, each will have its own needs for tracking and reporting on performance.

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4.2.2 Basic Requirements for Reporting Systems

Some basic information will be common to most projects and should be included in the reporting systems:

- tracking of funds

  - when received and expended and
  - actual vs. budgeted expenditures,

- tracking of project performance

  - requires preparation of work plan/schedule and
  - monitors actual vs. scheduled activities,

- identification of bottlenecks.

4.2.3 Development of Specific Project Systems

General

- Overall responsibility for development of the reporting systems lies with the Project Manager for Performance Tracking, under the direction of the Program Manager.

- System development for the various projects should be done in collaboration with consultants engaged to work on the projects.

Revolving Funds

- The Project Manager for Performance Tracking should work closely with the consultant chosen to develop these funds (Contract 7).

- System should include such data as:

  - applications (number per period, location),
  - funds status (deposits, withdrawals),
  - installations (number, average time from application to completion, cost),
  - payments received (amounts, delays/arrears),
  - payments to GOJ (interest),
  - identification of problems, and
  - summary report for USAID and NWC Managing Director.

Leakage Program

- The Tracking Project Manager should work closely with the Leakage Detection Consultant (Contract 4).

- The system should have four parts, one for each phase described in Section 2.6.

- Vehicle and commodities purchased under this program should be integrated into the PWA MIS system designed for that purpose.

- The system for each phase should include basic information described in Section 4.2.2 and such additional data as deemed important.

- An overall Leakage Program summary report should be prepared for use by USAID and the NWC Managing Director.

Communal Water System

- The Tracking Project Manager should work closely with the specialized consultant (Contract 8).

- System should include such data as:

  - progress during study phase (field trips, alternatives under consideration, estimated cost recommendations, progress vs. work plan, engineering costs expended vs. budgets, bottlenecks); and

  - pilot plan operations (results, technical problems, problems with cost recovery, consumer reactions, overall recommendations).

Water Schemes

- Separate reporting systems will be prepared for the Norwood off-site facilities and for the 20 or so minor water schemes, but the systems would follow essentially the same format.

- Systems will include such data as:

  - status of designs, cost estimates, and estimates of when project is to be tendered,

  - information during construction (progress vs. schedules, costs expended vs. budgets, problems and proposed means of overcoming them), and

  - information on tendering, award, and start of construction.

- Prepare summary system reports for USAID and the NWC Managing Director.

4.2.4 Timing of Reports

- Unless there are good reasons against it, reports should be prepared monthly. If feasible, reports could be staggered to avoid the burden of all reports coming due the same day. Some could cover a one-month period ending the 10th or 20th day of the month as well as the last day.

- Whatever the period, reports should be completed and delivered not later than ten days after the end of the period.

Chapter 5

CAPITAL INVESTMENTS

5.1 Government of Jamaica Investments

5.1.1 NWC Capital Investments

- The Managing Director said annual capital investments under NWC's control were on the order of J$75 to 80 million per year recently. NWC's fiscal year runs from 1 April to 31 March.

- A very rough draft of NWC's 1989/1990 capital budget listed projects with a total estimated cost of J$101 million. Approximately J$38 million of this appeared to be funding expected from the European Economic Community (EEC) since funds for four projects were originally designated in ECUs (European Currency Units). If so, Jamaican source funds in the coming year's capital budget would be only on the order of J$62 million.

- The capital budget for CECL's water programs is not included in NWC's budget. On the other hand, NWC's budget shows the EEC projects which have been assigned to CECL for implementation.

- NWC's 89/90 budget listed funding for about 35 projects (not including the EEC projects), for an average cost of about J$1.8 million per project; the largest being J$4 million. About six projects were listed with no funding allocation.

5.1.2 CECL Capital Investments

- CECL's General Manager says CECL's budget averages about J$150 million per year. With a core staff of only 30 and no operation and maintenance responsibilities, presumably the bulk of that figure represents capital expenditures.

- NWC's Managing Director puts CECL's budget at about J$100 million per year. Actual CECL budgets were not reviewed. From talks with CECL senior staff, it appears that most internationally funded projects are assigned to CECL.

5.2 Investments from International Funds

5.2.1 USAID

- USAID funding for water and sewer capital investments tends to be related to the broader goals of shelter and urban development.

- USAID is assisting in the funding of major sewerage and water facilities as part of the Urban Development Corporation (UDC) Inner Kingston Development Project. A J$23 million contact was recently signed for the construction of these works.

- Over the years, USAID has made substantial investments in rural water systems and, more recently, has provided funding for rehabilitation of the Logwood water system which serves Negril.

- USAID is also providing funds to Jamaica for hurricane rehabilitation projects, including some J$27 million for water and sewerage works.

- More directly, the works described in this report are being funded for a two-year period as part of an MOC/H shelter and urban services project.

5.2.2 World Bank (IBRD)

- The World Bank is providing on-going support to NWC in five areas:

  - technical assistance and training,
  - water supply improvements,
  - water transmission improvements in Kingston,
  - sewerage facility improvements in Kingston, and
  - support facility improvements (vehicles and stores).

- This work is being done through a US$9 million loan (J$49 million). About 50 percent of the funds have been disbursed to date. This four-year project is scheduled to be completed by 30 June 1990. Some of these funds were diverted to emergency relief following Hurricane Gilbert in September 1988.

- The NWC 89/90 capital budget identifies some J$16 million in capital works to be funded by IBRD out of the loan. Those funds are not included in the J$62 million referred to in Section 5.1.1.

5.2.3 European Economic Community (EEC)

- EEC has provided the GOJ with a grant valued at J$39 million for rural water supply schemes in Clarendon, Manchester, St. Elizabeth's and St. Mary's Parishes.

- CECL says this project is for six schemes whose needs were originally identified by the NWC. CECL has been given responsibility for implementing these schemes.

- This information is supported by the information shown in the NWC 89/90 capital budget:

Location/Parish	Comments	EEC Funding
So. Chapleton/Clarendon	(1.25mgd)	J$4.56M
So. Manchester/Manchester	(4 schemes)[5]	11.70
Elderlie-Niagara/ St. Elizabeth	(2.25mgd)	5.80
Castleton-II/St. Mary	(4.5mgd)	16.83
	Total	J$38.89M

- EEC is also providing funding on the order of J$140 million (U.S.$26 million) for sewerage schemes in Negril and Ocho Rios.

5.2.4 Government of Japan (OECF)

- The Japanese and Jamaican governments signed an agreement in November 1988 for a loan valued at J$162 million (US$30 million).

- The loan will be used mostly for the extension of water mains to serve Montego Bay. Tenders have been called and are expected to be opened in February 1989.

5.2.5 Caribbean Development Bank (CDB)

- CDB is providing a J$21 million loan for an island-wide program for the rehabilitation of an old system of rainfall catchment and storage facilities. (These works were originally constructed about 50 years ago by the Colonial Development and Welfare Department run by the U.K. They were communal style water systems principally meant to serve rural areas.) The project has been funded but not yet implemented.

- CDB is also providing J$6 million for pipe replacement related to hurricane rehabilitation.

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[5]Gutters/Down, Victoria, Crosskeys/Rest Store, and Whitney Town/Scotts Pass

5.2.6 Inter-American Development Bank (IDB)

- IDB provided a loan in 1978 valued at J$58 million for the Mandeville water supply. This work is now essentially completed, and no other IDB capital investments are currently expected.

- IDB is, however, funding a current month-long training course in Mandeville for leakage detection, as noted earlier.

5.2.7 Government of Italy

- Italy is providing funding in support of improvements to water systems in Negril and Ocho Rios, in an agreement just signed this month. Italy is providing equipment and commodities and funding the local construction of civil works. Italy is providing J$107 million, about equally spread between the two projects, while the GOJ has agreed to pay J$71 as its share of the cost of the two projects.

5.2.8 Summary

- There does not appear to be any significant funding from any other international source except as noted above.

- No information was obtained about how much of these capital program funds are to be spent in the coming fiscal year 89/90 or what portion of CECL's budget these international funds account for.

5.3 Capital Investment Planning Needs

- This brief look at capital investments for water and sewerage works underscores the need for improved capital investment planning.

- To plan for capital investments requires that there be a cohesive long-term plan which identifies needs and proposes the facilities to meet those needs, all within the capacity of the GOJ to implement such a plan. Only then can there be rational capital investment planning.

- For the short term, however, there is a need to assign, within the NWC, responsibility to coordinate all capital investment in Jamaica for water and sewerage regardless of who provides the funds or executes the projects.

Chapter 6

PROJECT BUDGET SUMMARY

Description	Budget Amounts J$(000) Technical Assistance	HG-013 Loan	Other
Water Conn. Revolv. Fund	300	2,400	-
Sewer Conn. Revolv. Fund	-	4,200	-
Leakage Program	2,500	3,000	5,500[1]
Communal Water	1,500	3,000	-
Off-Site, Norwood	900	4,800	4,800[2]
Small Water Schemes	-	9,000	-
NWC Contract Managers[3]	1,000	-	-
NWC Support[4]	-	200	-
Misc. Support	-	500	-
	J$6,200	J$27,100	J$10,300

(1) From commodities allocation of Project No. 532-0158, Hurricane Reconstruction (Equivalent US$1,000,000).

(2) Suggest be charged to MOC/H share of HG-013 loan. Otherwise, total NWC share of HG-013 loan would be J$31.9 million.

(3) TA is budget for the Program Manager and two Project Managers.

(4) Allowance for travel expenses and support for twinning programs in Florida and the Caribbean.

Chapter 7

IMPLEMENTATION PLAN AND SCHEDULE

A preliminary schedule for the proposed NWC activities under the HG-013 Program for the first year are shown in the table on the following page.

Critical early activities include the following:

- RHUDO to obtain short-term technical assistance to prepare scopes of work, position descriptions, outline contracts, CBD notice for the leakage consultant, and leakage repair equipment specifications.

- NWC to initiate a search for the proposed three managers to assist NWC in the implementation of this project. The overall project manager should be engaged as early as possible, and the others soon thereafter.

- Utilizing the equipment specifications, a PIO/C should be prepared to ensure the earliest possible procurement of this equipment.

- Publish the CBD notice to ensure the earliest possible procurement of a U.S. leakage detection consultant.

- Select a U.S. consultant for communal water supplies from among qualified IQC consultants.

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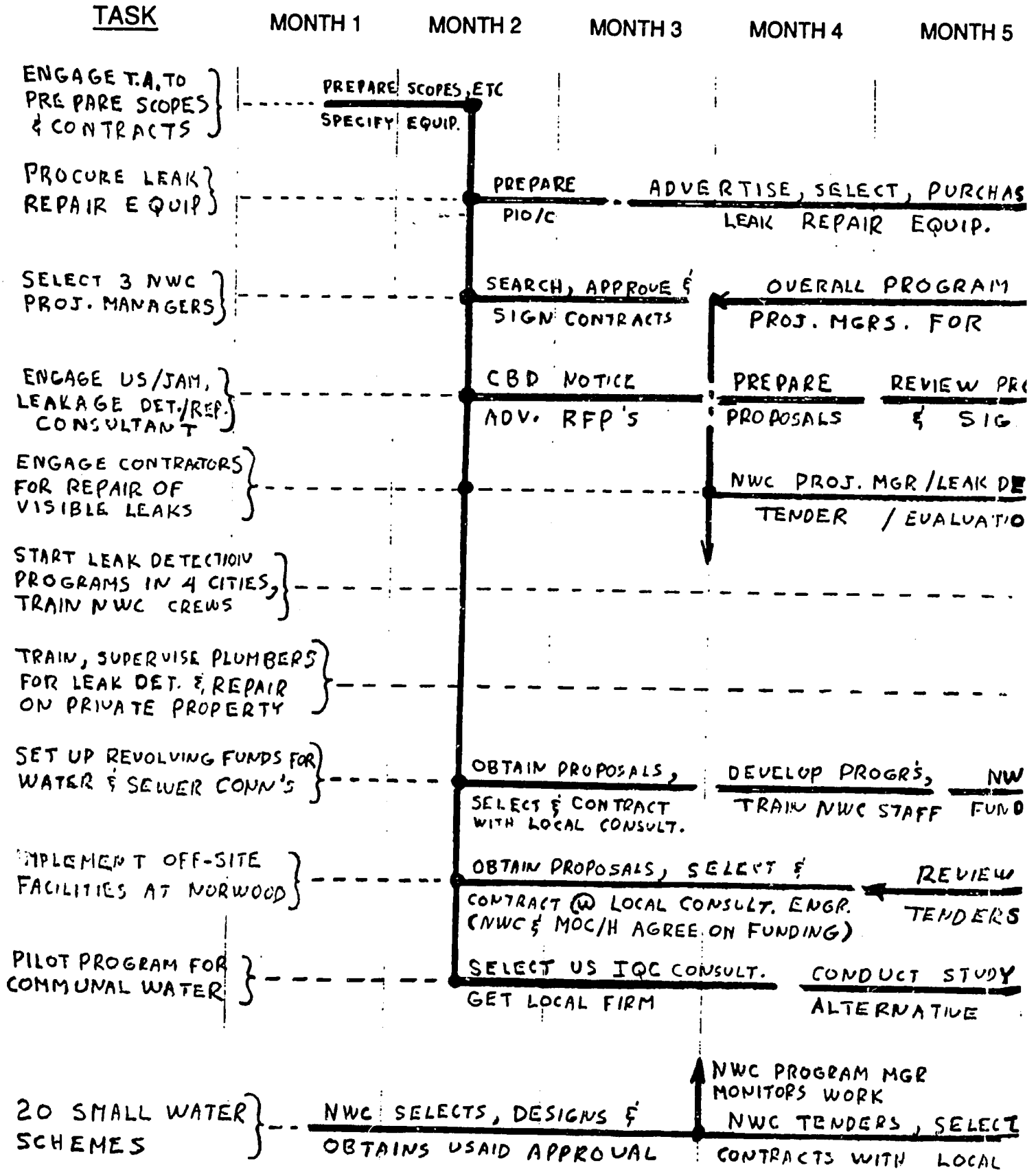
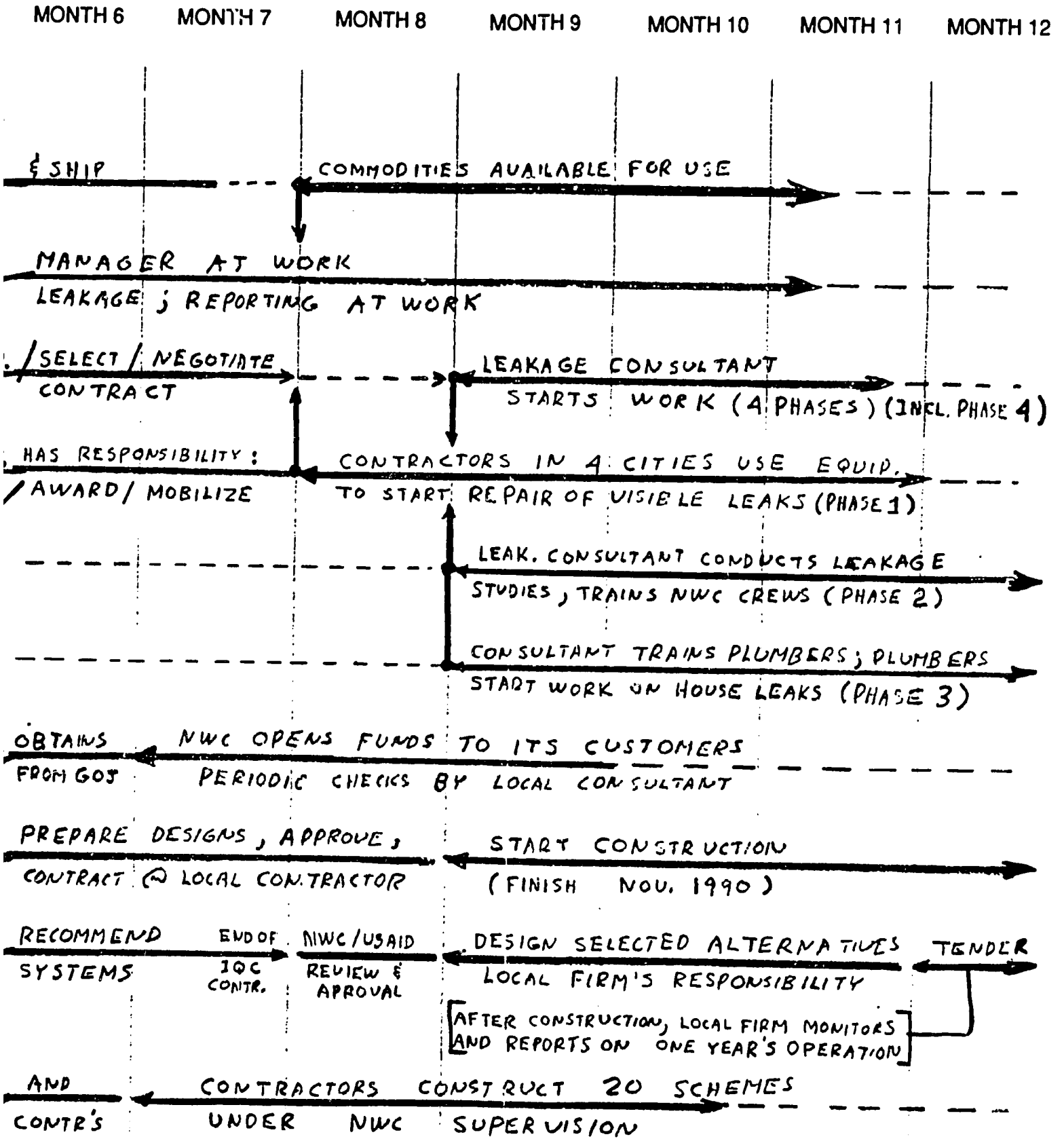
NWC ACTIVITIES UNDER HG-013



'ROGRAM: FIRST YEAR SCHEDULE



APPENDIX A

SCOPE OF WORK

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ACTION COPY

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INCOMING TELEGRAM

Department of State

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ACTION AID-00

ACTION OFFICE MO-02
INFO LACP-04 LACO-01 LACA-03 LACM-02 PPM-01 GC-01 GCLA-03
ES-01 PRE-06 ASPA-01 ECDP-01 SEC3-02 FPA-02 SERP-01
RELO-01 AMAD-01 NUD-02 /040 AD

INFO LOG-00 /000 W

R 1215552 DEC 88
FM AMEMBASSY KINGSTON
TO SECSTATE WASHDC 8833

UNCLAS KINGSTON 13192

ADM AID

FOR PRE/M J. HAGGER

E.O. 12356: N/A
SUBJECT: JAMAICA HG-013: WASH WORK ORDER REQUEST

1. RHUDO/JAMAICA REQUESTS PRE/K PREPARE WORK ORDER TO WASH TO OBTAIN THE SERVICES OF A SENIOR WATER/SANITATION ENGINEER TO UNDERTAKE THE FOLLOWING SCOPE OF WORK IN EARLY JANUARY, 1989.

TERMS OF REFERENCE

I. INTRODUCTION

UNDER THE RECENTLY AUTHORIZED JAMAICA SHELTER AND URBAN SERVICES POLICY PROGRAM (532-HG-013), APPROXIMATELY 5 MILLION U.S. DOLLARS IN PROJECT ACTIVITIES WERE IDENTIFIED TO BE UNDERTAKEN BY THE JAMAICAN NATIONAL WATER COMMISSION (NWC), THE PRINCIPAL AUTHORITY FOR WATER AND SEWER INFRASTRUCTURE DEVELOPMENT IN JAMAICA. SIX PROJECT ACTIVITIES HAVE BEEN IDENTIFIED FOR IMPLEMENTATION BY THE NWC WHICH ARE OF A CRITICAL NEED, BENEFIT PRIMARILY LOW INCOME HOUSEHOLDS, ARE READILY IDENTIFIABLE AND TARGET WIDE GEOGRAPHIC AREAS. THESE PROJECTS INCLUDE:

A. REVOLVING FUND TO ENHANCE AFFORDABILITY OF HOUSEHOLD WATER CONNECTIONS

B. OFF-SITE INFRASTRUCTURE DEVELOPMENT TO FACILITATE SITES AND SERVICES DEVELOPMENT FOR LOW INCOME FAMILIES
C. LEAK DETECTION AND SYSTEM MAINTENANCE INCLUDING THE POTENTIAL FOR PRIVATIZATION OF ASPECTS OF THESE FUNCTIONS

D. REVOLVING FUND TO ENHANCE AFFORDABILITY OF HOUSEHOLD SEWER CONNECTIONS

E. CONSTRUCTION OF COMMUNAL WATER SUPPLY SYSTEMS ON A COST RECOVERABLE BASIS

F. MINOR WATER SUPPLY SYSTEMS EXTENSION

TO DATE, A FAIR AMOUNT OF DESIGN WORK HAS ALREADY BEEN UNDERTAKEN IN DEFINITION OF PROJECTS A, C AND D.

II. SCOPE OF WORK

THE CONSULTANT WILL UNDERTAKE THE FOLLOWING SPECIFIC TASKS AS PART OF THIS ASSIGNMENT IN CLOSE COLLABORATION WITH TECHNICAL AND MANAGERIAL STAFF OF THE NWC:

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A. ASSIST NWC AND USAID IN TECHNICAL DESIGN AND MANAGERIAL REQUIREMENTS FOR IMMEDIATE IMPLEMENTATION OF THE ABOVE PROGRAM WITH SPECIFIC EMPHASIS ON:

1. FINALIZING DESIGN WORK ON PROJECTS A, C AND D.

2. DEVELOPING PROJECT DESIGNS/PROFILES AND WORK PLANS FOR THE REMAINING THREE PROJECTS B, E AND F.

3. ASSESSING THE CAPABILITY OF THE NWC TO IMPLEMENT THE SIX PROJECTS BY REVIEWING CURRENT NWC PLANS TO HIRE PROJECT MANAGERS FOR EACH PROJECT ACTIVITY UNDER THE GENERAL DIRECTION OF A NWC PROGRAM MANAGER.

4. IDENTIFYING ADDITIONAL SHORT-TERM JAMAICAN AND EXPATRIATE TECHNICAL ASSISTANCE AND STAFF TRAINING NEEDS TO SUPPORT IMMEDIATE IMPLEMENTATION OF THESE PROJECTS.
5. IDENTIFYING POSSIBLE INTERNAL REPORTING MECHANISMS WITHIN THE NWC TO TRACK PROJECT PERFORMANCE AND FINANCIAL REQUIREMENTS

6. IDENTIFYING POSSIBLE MECHANISMS FOR REPORTING TO USAID TO ALLOW TRACKING OF PROJECT PERFORMANCE AND IDENTIFICATION OF BOTTLENECKS

7. REFINING A PHASED SCHEDULING AND PRIORITIZATION FOR PROJECT IMPLEMENTATION

8. REFINING PLANS FOR MICRO COMPUTER USE IN PROJECT TRACKING

B. ASSIST THE NWC AND USAID IN THE DEFINITION OF A LONGER RANGE INSTITUTIONAL DEVELOPMENT PLAN TO STRENGTHEN NWC CAPACITY TO PERFORM THIS AND RELATED WORK ON A SELF-SUSTAINABLE BASIS IN THE FUTURE. TO THE EXTENT POSSIBLE, THE CONSULTANT WILL IDENTIFY SPECIFIC TECHNICAL ASSISTANCE, STAFFING AND TRAINING NEEDS AT THE MANAGERIAL AND SUPERVISORY LEVELS OF NWC STAFF. CONSULTANT WILL PARTICULARLY EXAMINE THE MOST EFFICIENT DIVISION OF IMPLEMENTATION AND PROJECT SUPERVISION RESPONSIBILITIES BETWEEN NWC STAFF AND PRIVATE SECTOR CONTRACTORS AS PART OF THE INSTITUTIONALIZATION OF THE ABOVE TYPES OF PROJECTS.

C. PROVIDE USAID WITH A SHORT INSTITUTIONAL PROFILE AND OVERVIEW OF NWC OPERATIONS INCLUDING STAFF LEVELS BY CATEGORIES, CAPITAL INVESTMENT PROGRAM, CURRENT EXPENDITURES, FINANCIAL STATUS AND PERTINENT INFORMATION.

D. THE CONSULTANT WILL ALSO WORK WITH NWC AND USAID TO IDENTIFY CAPITAL INVESTMENTS UNDER THE ON-GOING NWC PROGRAMS, FUNDED THROUGH PUBLIC SECTOR RESOURCES, WHICH COULD POTENTIALLY QUALIFY AS ELIGIBLE EXPENSES UNDER THE JAMAICA SHELTER AND URBAN SERVICES POLICY PROGRAM AS OUTLINED IN THE INTRODUCTION OF THIS CABLE AND IN THE SECTORAL APPROVAL DOCUMENT.

IN UNDERTAKING THIS ASSIGNMENT, CONSULTANT WILL REVIEW RELEVANT RESTRICTIONS PLACED ON NWC OPERATIONS BY ITS AGREEMENT WITH THE WORLD BANK, AS WELL AS WORLD BANK PLANS FOR TECHNICAL ASSISTANCE AND OTHER INSTITUTIONAL SUPPORT. WORLD BANK PROJECT OFFICER IS ROY ROMANI, PROJECTS DEPT, TELEPHONE NUMBER: (202) 477-1234.

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III. REPORTING REQUIREMENTS

ALL RECOMMENDATIONS WILL BE REVIEWED BY NWC AND USAID STAFF PRIOR TO REPORT PREPARATION, AND A DRAFT REPORT WILL BE PROVIDED TO NWC AND USAID PRIOR TO THE CONSULTANT'S DEPARTURE FROM JAMAICA. FINAL REPORT WILL BE PREPARED WITHIN TWO WEEKS OF RECEIPT OF NWC/USAID COMMENTS ON DRAFT.

IV. PERSONNEL REQUIREMENTS

THE SERVICES OF A SENIOR WATER/SANITARY ENGINEER ARE REQUIRED. CONSULTANT SHOULD HAVE PREVIOUS EXPERIENCE WITH WATER/SEWERAGE AUTHORITY MANAGEMENT AND INSTITUTIONAL DEVELOPMENT AS WELL AS HANDS ON EXPERIENCE IN SIA PROJECT AREAS.

V. SCHEDULE

ASSIGNMENT TO BEGIN WEEK OF JANUARY 3, 1988.

CONTRACT PERIOD: 24 DAYS BROKEN DOWN AS FOLLOWS:

A. TWO DAYS PREPARATION IN THE U.S. AND CONSULTATION WITH WORLD BANK, IF POSSIBLE AND APPROPRIATE.

B. ONE DAY TRAVEL TO AND FROM JAMAICA

C. 18 DAYS OF FIELD WORK IN JAMAICA

D. 3 DAYS REPORT PREPARATION IN U.S.

SIX DAY WORK WEEK AUTHORIZED FOR FIELD WORK ONLY UNLESS WASH CONTRACT PROVIDES OTHERWISE.

VI. ESTIMATED BUDGET

A.	SALARY	274 FOR 18 DAYS	4932
B.	AIRFARE		780
C.	PER DIEM	125 FOR 18 DAYS	2250
D.	MISC		500
TOTAL			8362

2. PLEASE PROVIDE RHUDO STATUS ON WORK ORDER ASAP. PLEASE PROVIDE RHUDO ASAP CV'S FOR POTENTIAL CONSULTANTS FOR SELECTION AND CLEARANCE IN CONSULTATION WITH NWC.

3. ASSISTANCE APPRECIATED.
DRAFTED:CDEIKUM;APPROVED:LSMITH
SCTIRHCS

APPENDIX B

OUR PUBLIC IMAGE

Article from *Pipeline*, Quarterly Magazine for the Employees of the National Water Commission. December 1988.

PIPELINE
QUARTERLY MAGAZINE FOR THE EMPLOYEES OF THE NATIONAL WATER COMMISSION

Our Public Image

IF you've lost your credibility, you can't buy it at a drugstore or from a Public Relations firm. Once your public image has been tarnished and your name sullied, you will have a tough task dealing with the public, especially when you want to emerge with an enhanced reputation.

That's the reality we at the National Water Commission now face.

The NWC has been portrayed as a bad card. Some people still see the Commission as an uncaring public institution.

This is largely because of the problems people experience, from time to time, with their water supply and their bills. And you know how it is when money matters come into the picture. .

To be sure, we have not always performed well; we have not always lived up to our mandate to provide a reliable and efficient water supply and sewerage service for this country. Besides, our customer relations still needs improvement.

The majority of us are doing our best to create a better image of the Commission and the speed with which water supplies were restored island-wide after the hurricane is eloquent testimony to the dedication which resides within our ranks. So we must never become so discouraged about the fact that positive results seem to be slow in coming, that we throw up our hands and succumb to the negative forces in our midst.

We should never forget that our organization is judged by our performance, or the lack of it; and the sum total of our performance is what results in the Commission's public image.

What is more, people's perception of the facts is almost as important as what the facts really are — because people act on their perceptions. At issue, then, is not just what we do, but how people perceive what we do. That perception determines their actions and their attitudes — and our success.

We must therefore continue to strive to protect our public image with good and sustained performance at all levels.

APPENDIX C

PERFORMANCE CATEGORY DEFINITIONS

Excerpt from WASH Technical Report No. 37, *Guidelines for Institutional Assessment: Water and Wastewater Institutions*, 1988. pp. 27-62

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PERFORMANCE CATEGORY DEFINITIONS

1. Organizational Autonomy
2. Leadership
3. Management and Administration
4. Commercial Orientation
5. Consumer Orientation
6. Technical Capability
7. Developing and Maintaining Staff
8. Organizational Culture
9. Interactions with Key External Institutions

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ORGANIZATIONAL AUTONOMY

Organizational autonomy is the institution's degree of independence from the national government or other governmental or regulatory bodies. While not unrestrained, this independence must exist to the extent that the institution is able to conduct its affairs and meet its responsibilities in an effective manner with minimum interference and controls by other entities.

Effective organizational autonomy is characterized by the power to make decisions about the following important matters: budget, revenues, hiring levels, pay and incentives, control of personnel, institutional policies, planning and construction of projects, and organizational goals.

An adequate level of autonomy is a prerequisite to the success of institutions in this sector.

LEADERSHIP

Leadership is the ability to inspire others to understand the institution's mission, to commit themselves to that mission, and to work toward its fulfillment. It goes well beyond proficiency in management skills. In order to perform its functions in a competent manner, an institution in any sector needs to have effective leadership at many different levels.

Effective leaders serve as positive role models. They provide motivation for managers and staff to perform their functions in often difficult and sometimes apparently unrewarding contexts. Effective leaders help transform the institution by making it active, energetic, and visionary and by making the sum of the parts greater than the whole. In effective institutions, such leadership does not reside only with the top manager. Elements of it can be seen at various levels of the organization, from the foreman level to the general manager level, although these elements may differ slightly from level to level.

MANAGEMENT AND ADMINISTRATION

Management is organizing people and resources to accomplish the work of the institution. Effective management is demonstrated by the capacity to get the most out of the resources available (human and other) in a deliberate or planned manner. Good managers have a clear sense of goals and priorities; they know who to rely on to get a job done and how to delegate to them the means to do it. Effective managers are aware of operational details; they monitor the work and follow-up consistently. An effective management climate is characterized by teamwork, cooperation and good communication among the staff.

The counterpart to management skills is the existence and use of key administrative systems. These are the policies and procedures which regulate and guide the actions of management. The mature organization has designed or evolved effective sub-systems such as personnel, budget, accounting, financial management, commercial procurement, and management information systems.

COMMERCIAL ORIENTATION

Commercial orientation is the degree to which actions in an institution are driven by cost effectiveness and operating efficiency. The performance of an institution's functions should be guided and disciplined by a strategy to achieve financial self-sufficiency at an appropriate stage of growth. This orientation can be viewed at both operational and policy levels, and both levels are important. At the policy level, commercially oriented institutions structure and stage investments, expenditures, and revenues to achieve financial equilibrium annually.

Operationally, everyday activities are guided by quality standards and by constant attention to cost factors. The institution strives to establish a reputation as a financially well run business in the eyes of the financial and outside community in order to obtain financial support for growth and to maximize financial and operating autonomy.

(Note: Commercial orientation may be more readily achievable by water institutions but it is also important for wastewater institutions, even if significant revenues are routinely derived through subsidies.)

CONSUMER ORIENTATION

Consumer orientation is organizing and directing the services of the institution towards consumers. People who staff an effective institution in the sector see serving consumers as their primary function. All work, all programs, all innovations are directed toward greater efficiency, effectiveness, and equity in service to the consumer. Staff at every level are aware of this consumer orientation and see it as governing positively their important daily operational decisions and actions.

Effective institutions in the sector have workable means wherein consumers can interact with them. These may include emergency outlets or "hotlines" when there are crises, clearly identified places where disputes about bills or service can be arbitrated, ways that interested consumers can make suggestions in overall policy, and so on. Creative and cost-effective ways are sought to inform and educate the public. Where consumerism is not present, appropriate, politically acceptable means are employed to attain an effective level of consumer protection in the institution.

TECHNICAL CAPABILITY

Technical capability is the measure of the institution's competence in conducting the technical work required to carry out the responsibilities of the institution. Most of this technical work is performed directly by skilled, qualified employees, but outside specialists whose work is supervised by the institution's staff may be used where appropriate.

DEVELOPING AND MAINTAINING STAFF

Developing and maintaining staff include those activities directed toward recruiting staff, providing skills to do the jobs and grow professionally, and providing adequate job satisfaction and wages and benefits to retain competent personnel.

Effective institutions develop and maintain their personnel. This includes both formal training programs and the informal training that occurs through on-the-job training, apprenticeships, and job rotation. In addition to a regular process of skill transfer, effective institutions maintain staff through providing sufficient incentives, compensation, employee benefits, and promotion opportunities so there is a minimum of unwanted turnover. Institutions that develop and maintain staff feel that people are their most important asset. There is a constant emphasis on learning.

ORGANIZATIONAL CULTURE

Organizational culture is the set of values and norms which inform and guide everyday actions. The culture forms a pattern of shared beliefs and assumptions which translate into behavior which can be observed.

An organization's culture is conveyed in a number of intended and unintended ways. Although often unstated, cultural beliefs, behaviors, and assumptions serve as a powerful means for defining and justifying organizational operations either in positive or negative ways. This will sometimes be expressed by introductory explanations given by staff with the message "this is what we are about here." It will be unintentionally expressed in the tone of the message (excited, bored, harassed, organized). It will also be expressed unintentionally in the way facilities look. Are they clean, kept up, or in a shambles?

Another factor in corporate culture is how the institution has dealt with change or crisis. When a major change has been introduced (new technology, organizational restructuring, a new billing system, new leadership or influential staff), people are often required to alter the way they operate. It is important to know how the organization has responded to new systems or personnel. Does it refuse to change, pretend to change, change superficially, change only for a short term or in a distorted fashion, or does it realign its forces positively to support innovation? An unhealthy corporate culture will be highly resistant to any change; forces will line up to protect narrow self interests (such as graft or petty bureaucratic authority) at the cost of overall organizational health.

The organization with a positive culture has a clear sense of mission and identity. This is often expressed by a majority of the employees in the form of "legends about the organization" or messages about "who we are." In positive terms, this often takes the form of a sense of pride in belonging to the group and a sense of the history of the organization which is passed on from old to new employees.

INTERACTIONS WITH KEY EXTERNAL INSTITUTIONS

The institution's capacity to influence positively and strategically those institutions which affect its financial, political, and legal ability to perform is the essential characteristic of this category.

Many entities in the external environment affect the performance of a water/wastewater institution. These include the political (parent ministry and legislative bodies), financial (lending sources and budget/finance ministry), and regulatory entities (municipal government, state government, health ministry) which have an influence over operations. An effective organization has the ability to influence and adapt to these external entities to achieve its goals. This is accomplished by anticipating activities which might affect the institution and establishing strategies to deal with them.

APPENDIX D

NWC MISSION STATEMENT

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NATIONAL WATER COMMISSION

A. **MISSION STATEMENT**

PRODUCE AND DISTRIBUTE POTABLE WATER AND COLLECT, TREAT AND DISPOSE OF WASTE WATER AT THE LOWEST POSSIBLE COST CONSISTENT WITH LONG-RUN VIABILITY, CHARGING RATES SUFFICIENT TO RECOVER COSTS, RECOGNIZING THE NEED TO PROVIDE A MINIMUM SUPPLY AT AN AFFORDABLE COST TO ALL CONSUMERS WHILE MAINTAINING REASONABLE CONDITIONS OF EMPLOYMENT.

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B. **OBJECTIVES**

1. TO ENSURE THAT RATE STRUCTURE IS SUFFICIENT TO MEET FINANCIAL REQUIREMENTS.

2. TO MAXIMIZE COLLECTIONS FROM ALL SOURCES WHILE ENSURING AN EFFICIENT BILLING SYSTEM, STRESSING TIMELINESS AND ACCURACY.

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3. TO HAVE IN PLACE AN EFFICIENT FINANCIAL MANAGEMENT SYSTEM TO ACCURATELY RECORD ALL ASSETS AND LIABILITIES AND TO ENSURE THE PROPER CUSTODY OF ALL SUCH ASSETS.

4. TO PUT IN PLACE THE NECESSARY COMMUNICATION CHANNEL TO ADEQUATELY AND EXPLICITLY INFORM ALL APPROPRIATE AGENCIES AND THE PUBLIC OF THE ACTIVITIES OF THE COMMISSION BY TIMELY, ACCURATE AND MEANINGFUL REPORTS.

5. TO RESEARCH, PLAN, DEVELOP, UPGRADE AND CONSTRUCT ON A NATIONAL BASIS ADEQUATE WATER SUPPLY AND WASTE WATER DISPOSAL SYSTEMS AT INTERNATIONALLY ACCEPTED STANDARDS AND SPECIFICATIONS AT THE MOST ECONOMIC COST.

6. TO OPERATE AND MAINTAIN WATER SUPPLY SYSTEMS, OPTIMIZING THE SUPPLY AND DISTRIBUTION OF WATER TO THE CONSUMER AT ADEQUATE QUANTITIES AND PRESSURES WHILE MEETING INTERNATIONALLY ACCEPTED QUALITY STANDARDS.

7. TO COLLECT, TREAT AND PRODUCE WASTE WATER EFFLUENT MEETING ACCEPTED STANDARDS, AND DISPOSE OF SUCH EFFLUENT IN A MANNER NOT DETRIMENTAL TO THE ENVIRONMENT.

8. TO ENSURE THE MOST EFFECTIVE PLANNING, RECRUITMENT SELECTION, MOTIVATION, TRAINING AND DEVELOPMENT, AND COMPENSATION OF THE ORGANIZATION'S HUMAN RESOURCES.

THUS MAINTAINING A CLIMATE CONDUCIVE TO THE DEVELOPMENT OF THE HUMAN RESOURCES POTENTIAL AND ENHANCING THE EFFICIENCY OF THE ORGANIZATION.

9. TO PLAN FOR AND PROCURE GOODS AND SERVICES ON THE MOST ECONOMIC BASIS AND IN A TIMELY MANNER TO ENHANCE THE EFFICIENT RUNNING OF THE ORGANIZATION.

10. TO DEVELOP THE ORGANIZATION'S WATERSHEDS TO MAINTAIN AND PRESERVE RIVER AND STREAM SOURCES, ELIMINATING SILTATION AND SOIL EROSION.

11. TO DEVELOP A DYNAMIC PUBLIC AND CONSUMER RELATIONS SYSTEM TO PROJECT THE IMAGE OF THE COMMISSION, EDUCATE AND KEEP THE PUBLIC INFORMED SO AS TO PROMPTLY AND COURTEOUSLY RESPOND TO CUSTOMERS' CONCERNS.

3rd November, 1986

APPENDIX E

INSTITUTIONAL ASSESSMENT:
AN OVERVIEW OF THE PROCESS

Excerpt from WASH Technical Report No. 37, *Guidelines for Institutional Assessment: Water and Wastewater Institutions*, 1988. pp. 9-10.

INSTITUTIONAL ASSESSMENT: AN OVERVIEW OF THE PROCESS

The Process of Institutional Assessment: Procedures

The following chart represents the major steps in the institutional assessment procedures. It is the sponsor's task to carry out steps 1 through 3 prior to the arrival of the assessment team. The results of these steps need to be communicated to the team and built into the scope of work of the team. The team will carry out steps 4 through 6. A note about terminology in the chart: "sponsor" is the donor/lender agency which funds the institutional assessment activity; "team" is the outside assessment team; "institution" is the water or wastewater organization which is being assessed. "Organization" and "institution" are used interchangeably.

STEP	TASK	RESPONSIBLE
1. Assess Output Measures	• Initial discussions with institutional leadership/idea promotion • Preliminary data collection of output measures • Analysis of outputs • Determine need for institutional assessment • Make go/no-go decision	Sponsor
2. Agreement with Institution	• Explain process in detail to decision-makers and get agreement and clarity on expectations of end products • Discuss mission of the institutional assessment team and agree on goals and scope • Develop written scope of work • Determine team composition	Sponsor

3.	Prepare Institution for Team Entry	• Discuss arrangements with key managers in institution and form review committee with concurrence from top	Sponsor
		• Make arrangements for team's entry meeting with top management	
4.	Collect Data	• Team meets with top management and review committee to begin process and clarify scope of assessment work	Team
		• Use a variety of methods: interview, observation, job audits, reading, survey instruments	Team
		• Take diagonal "slice" of organization	
5.	Analyze Data	• Independent Analysis	Team
		• Team Analysis	
		• Look for major patterns and themes	
		• Share initial analysis with organizational review committee/leadership	
6.	Diagnose Strengths and Weaknesses	• Compare patterns/themes against performance	
		• Prepare written profile	
		• Present analysis to appropriate decision-makers and organization	Team

APPENDIX F

REFERENCES

REFERENCES

Cullivan, Donald et al. "Guidelines for Institutional Assessment of Water and Wastewater Institutions", WASH Technical Report No. 37, Water and Sanitation for Health Project, Arlington, VA, Feb. 1988.

Edwards, Daniel. "Managing Institutional Development Projects: Water and Sanitation Sector", WASH Technical Report No. 49, Water and Sanitation for Health Project, Arlington, VA, May 1988.

Edwards, Daniel, and Austin, John. "Preimplementation Workshop on the Water Supply and Sanitation Sector Project: National Water Supply and Drainage Board of Sri Lanka : 26-29 April 1985", Field Report No. 151, Water and Sanitation for Health Project, Arlington, VA, May 1985.

Edwards, Daniel, and Pettit, J. "Facilitator Guide for Conducting a Project Start-up Workshop", WASH Technical Report No. 41, 1988. Water and Sanitation for Health Project, Arlington, VA, May 1988.

"Engineering Operational Assessment of the National Water Commission", Camp Dresser & McKee Inc., Boston, MA, July 1982.

Hebert, Paul. "Shelter and Urban Policy Program Sector Loan, NWC Participation: Strategy for Implementation of Initial Activities", The Urban Institute, Washington, DC, September 1988.

"Management Report: The National Water Commission in Transition", Camp Dresser & McKee Inc., Boston, MA, March 1986.

McLeod, Ruth. "Low Income Strategies in Kingston, Jamaica: Solutions of the Informal Sector", Construction Resource and Development Center, December 1987 (data on land tenure).

Miller, Barbara D., and Stone, Carl. "Household Expenditure Effects of the Jamaican Food Stamp Programme", Metropolitan Studies Program of Syracuse University, Syracuse, NY, August 1987 (data on expenditures of low-income families).

"Sector Approval Document: Jamaica Shelter and Urban Services Policy Program", USAID/RHUDO, Kingston, Jamaica, 1988.

Sterling, Stephen. "A Management Audit of the National Water Commission", Jamaica, March 1983.

Swezy, F. Curtiss, et al. "Review of the Jamaican Health Sector and an Assessment of Opportunities for External Donor Support", CDC, Abt Assocs, et al., 16 October 1987 (data in water sources).

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APPENDIX G

PERSONS CONTACTED IN JAMAICA

PERSONS CONTACTED IN JAMAICA

NWC

Mr. Jerome Thomas	Managing Director
Mr. Karl Bennett	Deputy Managing Director, Engineering & Operations
Mr. E.G. Hunter	Special Assistant to the M.D.
Mr. Louis Daley	Director, O&M Division
Mr. Anthony O'Connor	General Manager, Operations
Mr. Maurice Mitchell	General Manager, Special Services
Mr. Noel Gauntlett	Project Manager, O&M Division
Mr. Delroy Webster	Project Engineer, O&M Division
Mr. Maurice Jones	Consultant (IBRD), Water Engineer
Mr. Baltaeno Duffus	Director, Commercial Operations Division
Mr. R. Savin	Director, Support Services Division

CECL

Mr. Horace Davidson	General Manager
Mr. Patrick Saulter	Project Manager
Mrs. Marie Isaacs	Director of Finance

USAID/RHUDO

Mr. Lane Smith	Director RHUDO
Mr. George Deikun	RHUDO Officer
Mr. Peter Feiden	RHUDO Officer
Mr. Tom McAndrews	RHUDO Officer

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USAID

Mr. Charles Mathews	Chief Engineer
Ms. Rebecca Cohn	Health Development Officer
Ms. Audrey Tomlin	Vocational Education Officer
Mr. Tony Payne	Environmental Engineer
Ms. Cindy Owens	Procurement Officer

MOC/H

Mr. Robert Merrill	PADCO Consultant

Ministry of Public Service

Mr. Quince Francis	Director, Manpower Development Division

Ministry of Education

Ms. Arlie Dyer	Director, Technical and Vocational Education

Former NWC Officers

Mr. Steadley Webster	Former Member of the Board
Mr. Clinton Davis	Former Managing Director
Mr. Leo Lawson	Former Chief Engineer

International Agencies

World Bank:	Mr. Roy Ramani (in Washington, D.C.)
EEC:	Mr. Jonathon Rodwell
UNICEF:	Mr. Marilyn Dawson
PAHO:	Dr. Homero

Private Sector Consultants:

Price Waterhouse Associates

Mr. Bobby Zachariah

Mr. Raymond Binnie

Mr. V. Mohan

Peat Marwick Mitchell

Ms. Carol Fenton

Wallace Evans & Partners

Mr. Peter Hughes

Others:

Ms. Joyce McKenzie	Director, H.E.A.R.T. (Training)
Mr. Stephen Sterling	Author of JNIC 1983 Management Audit of NWC