

PROJECT DATA SHEET

1. TRANSACTION CODE

A = Add
 C = Change
 D = Delete

Amendment Number

9

DOCUMENT CODE

3

2. COUNTRY/ENTITY

Regional Development Office/Caribbean

3. PROJECT NUMBER

538-0138

4. BUREAU/OFFICE

LAC

05

5. PROJECT TITLE (maximum 40 characters)

Infra. Expansion & Maintenance Systems

6. PROJECT ASSISTANCE COMPLETION DATE (PACD)

MM DD YY
09 30 94

7. ESTIMATED DATE OF OBLIGATION
(Under 'B' below, enter 1, 2, 3, or 4)

A. Initial FY

B. Quarter

C. Final FY

8. COSTS (\$000 OR EQUIVALENT \$1 =)

| A. FUNDING SOURCE | FIRST FY | | | LIFE OF PROJECT | | |
|------------------------|--------------|------------|--------------|-----------------|---------------|---------------|
| | B. FX | C. L/C | D. Total | E. FX | F. L/C | G. Total |
| AID Appropriated Total | | | | | | |
| (Grant) | (1,100) | (100) | (1,200) | (15,500) | (4,000) | (19,500) |
| (Loan) | (1,800) | (0) | (1,800) | (9,500) | (5,000) | (14,500) |
| Other U.S. | | | | | | |
| 1. | | | | | | |
| 2. | | | | | | |
| Host Country | | | | | 4,700 | 4,700 |
| Other Donor(s) | | | | | | |
| TOTALS | 2,900 | 100 | 3,000 | 25,000 | 13,700 | 38,700 |

9. SCHEDULE OF AID FUNDING (\$000)

| A. APPROPRIATION | B. PRIMARY PURPOSE CODE | C. PRIMARY TECH. CODE | | D. OBLIGATIONS TO DATE | | E. AMOUNT APPROVED THIS ACTION | | F. LIFE OF PROJECT | |
|------------------|-------------------------|-----------------------|---------|------------------------|---------------|--------------------------------|----------|--------------------|---------------|
| | | 1. Grant | 2. Loan | 1. Grant | 2. Loan | 1. Grant | 2. Loan | 1. Grant | 2. Loan |
| (1) ESF | 701 | 804 | | 7,223 | 4,300 | 567 | 0 | 10,800 | 5,300 |
| (2) DA | | | | 5,190 | 9,200 | 0 | 0 | 8,700 | 9,200 |
| (3) | | | | | | | | | |
| (4) | | | | | | | | | |
| TOTALS | | | | 12,413 | 13,500 | 567 | 0 | 19,500 | 14,500 |

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each)

11. SECONDARY PURPOSE CODE

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code

B. Amount

13. PROJECT PURPOSE (maximum 480 characters)

To create an infrastructure environment which will stimulate investment and productive activity in the Eastern Caribbean.

14. SCHEDULED EVALUATIONS

Interim MM YY MM YY Final MM YY
0 6 9 0 0 9 9 3

15. SOURCE/ORIGIN OF GOODS AND SERVICES

Participating Countries of the Eastern Caribbean

000 941 Local Other (Specify) Caribbean

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a _____ page PP Amendment.)

The purpose of this PP Supplement amendment is to add \$567,000 in ESF grant funds to the St. Vincent Infrastructure Subproject (538-0138.07) for the Diamond Hill Industrial Estate Water Supply.

Approval of methods of Implementation and Finance.

James Sanford, Acting Controller

17. APPROVED BY

Signature: *A. S. Williams*
Title: Aaron S. Williams, Director

Date Signed MM DD YY
08 31 99

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION

MM DD YY

AUTHORIZATION

AMENDMENT NUMBER EIGHT

NAME OF COUNTRY: Caribbean Regional
NAME OF PROJECT: Infrastructure Expansion and
Maintenance Systems
NUMBER OF PROJECT: 538-0138

1. Pursuant to Section 531 of the Foreign Assistance Act of 1961, as amended, the Infrastructure Expansion and Maintenance Systems Project for the Caribbean Region was authorized on May 6, 1986, and amended on September 16, 1986; February 26, 1987; June 23, 1987; August 28, 1987; September 28, 1987; July 1, 1988 and August 18, 1988.
2. That Authorization is hereby amended to authorize additional funds for the St. Vincent Infrastructure Subproject (536-0138.07) and modify that Subproject description as follows:
 - a. Paragraph 2 shall be amended by deleting Subparagraph iii in its entirety and replacing it as follows:
 - iii. The St. Vincent Infrastructure subproject which will consist of
 - a) engineering services, construction services, related commodities and technical assistance to assist the Government of St. Vincent to rehabilitate and maintain selected roads to help create an infrastructure environment that will stimulate investment and productive activity in St. Vincent, and

b) will provide for the design and construction of a 2-1/4 mile, 6" ductile iron pipeline and 250,000 gallon, reinforced concrete water storage tank to provide an interim water supply for the Diamond Hill Industrial Estate. This component will complement development activities planned by CIDA and the CDB, the major contributors to the industrial estate project.

- 3. The authorization, except as previously and herein amended, remains in force and effect.

A. S. Williams

Aaron S. Williams
Director, RDO/C

8/31/89

Date

CLEARANCES:

| | | | |
|-------------------|----------------|-------|----------------|
| PDO:JPerry | <i>JDP</i> | Date: | |
| C/PDO:DACHiriboga | <i>DC</i> | Date: | <i>8/30/89</i> |
| C/INFRA:JBaird | (Draft) | Date: | 08/20/89 |
| A/CONT:JSanford | (Draft) | Date: | 08/21/89 |
| D/DIR:LTArmstrong | <i>LS</i> | Date: | <i>8/31/89</i> |
| A/C/PRM:CKeller | <i>CKeller</i> | Date: | <i>8/31/89</i> |
| RLA:RJohnson | <i>RJ</i> | Date: | <i>8/30/89</i> |

ST. VINCENT INFRASTRUCTURE
DIAMOND HILL INDUSTRIAL ESTATE WATER SUPPLY
PROJECT PAPER SUPPLEMENT AMENDMENT
NO. 538-0138.07
 to the
INFRASTRUCTURE EXPANSION AND MAINTENANCE SYSTEMS PROJECT
NO. 538-0138

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ST. VINCENT INFRASTRUCTURE
DIAMOND HILL INDUSTRIAL ESTATE WATER SUPPLY
PROJECT PAPER SUPPLEMENT AMENDMENT
NO. 538-0138.07
 to the
INFRASTRUCTURE EXPANSION AND MAINTENANCE SYSTEMS PROJECT
NO. 538-0138

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1

INFRASTRUCTURE EXPANSION AND MAINTENANCE SYSTEMS PROJECT (538-0138)

ST. VINCENT INFRASTRUCTURE

(538-0138.07)

PROJECT PAPER SUPPLEMENT AMENDMENT

I. SUMMARY AND RECOMMENDATIONS

A. Recommendations

1. Funding

RDO/C recommends the authorization of a \$567,000 grant to the Government of St. Vincent and the Grenadines to finance the Diamond Hill Industrial Estate (DIE) water supply component of the St. Vincent Infrastructure IEMS Subproject. Per State 409985 dated 02/18/89, all FY89 funds are to be obligated as grants, including those required to meet mortgages under existing loans.

The planned obligated status of the IEMS cluster project is as follows:

| <u>Project No.</u> | <u>Project Activity</u> | <u>Planned Amount</u> | <u>Obligated Amount</u> |
|--------------------|--------------------------------|-----------------------|-------------------------|
| 538-0138.00 | Core Contract | \$ 3,218,553 G | \$ 2,508,599 G |
| 538-0138.01 | St. Kitts Southeast Peninsula | \$11,500,000 L | \$11,500,000 L |
| | | \$ 1,000,000 G | \$ 990,000 G |
| 538-0138.02 | Grenada Infrastructure III | \$ 6,981,447 G | \$ 6,981,447 G |
| 538-0138.03 | Small Activities | \$ 2,300,000 G | 0 |
| 538-0138.07 | St. Vincent Infrastructure | \$ 3,000,000 L | \$ 2,000,000 L |
| | | \$ 1,000,000 G | \$ 433,000 G |
| 538-0138.08 | Regional Utilities Maintenance | \$ 5,000,000 G | \$ 1,500,000 G |
| | | | |
| | SUB-TOTAL GRANT (AUTHORIZED) | \$19,500,000 G | \$12,413,046 G |
| | SUB-TOTAL LOAN (AUTHORIZED) | \$14,500,000 L | \$13,500,000 L |
| | | | |
| | GRAND TOTAL | \$34,000,000 | \$26,480,046 |

The work to be carried out under this amendment will be implemented over a period of about twenty-four (24) months. Therefore, a revised Project Assistance Completion Date (PACD) of September 30, 1991 is proposed for the St. Vincent Infrastructure Subproject, a 14-month extension.

2. Geographic Code

The IEMS Project Authorization, as amended, specifies that, except as AID may otherwise agree in writing, goods and services financed by AID shall have their source and origin in the United States (AID Geographic Code 000), or in the recipient country. This will hold true for this subproject. However, for the road rehabilitation and water supply components, force account construction procedures will be utilized and the host country will be permitted to purchase shelf items of non-U.S. source/origin. Because these components will involve intensive use of shelf items (notably asphalt, fuel, cement, aggregate and reinforcing steel) an expansion of the shelf item procurement limitation has been included in the authorization for this subproject. Nevertheless, ocean shipping funded by AID under the subproject shall be financed only on flag vessels of the United States, except as AID may otherwise agree in writing.

B. Summary Subproject Description

This subproject amendment will fund infrastructure improvements directly related to industrial expansion: construction of a water supply system to serve a proposed industrial estate.

C. Summary Financial Plan (AID) Funding Millions US\$

| | <u>FY87</u> <u>Auth.</u> | <u>FY87</u> <u>Obl.</u> | <u>FY89</u> <u>Auth.</u> | <u>FY89</u> <u>Obl.</u> |
|--|-----------------------------|----------------------------|-----------------------------|----------------------------|
| 1. Rehabilitation of Approximately 14-15 Miles of Roads | 2.340 | 1.340 | 0 | 0.433 |
| 2. Procurement of Construction Equipment | .500 | .500 | 0 | 0 |
| 3. Technical Assistance | .110 | .110 | 0 | 0 |
| 4. Maintenance Program | .050 | .050 | 0 | 0 |
| 5. Construction of Water Facilities Serving Diamond Industrial Estate | <u>0</u> | <u>0</u> | <u>0.567</u> | <u>0.567</u> |
| TOTAL | 3.000 | 2.000 | 0.567 | 1.000 |

D. Summary Subproject Findings

This \$567,000 subproject amendment is ready for authorization and subsequent implementation and is considered to be socially, financially and economically sound as well as technically and administratively feasible.

II. SUBPROJECT BACKGROUND, RATIONALE AND DESCRIPTION

A. Subproject Rationale

The St. Vincent Industrial Estate Water Supply Project is part of a multi-donor effort aimed at providing productive employment and improving the water supply in the Diamond Hill area of the Eastern Caribbean island nation of St. Vincent. A new industrial estate will be located in this area, providing jobs for local residents and attracting persons in need of employment from other parts of the country. AID will provide funding for a water storage tank and pipeline that will enhance the supply capabilities of the existing system during periods of short supply and become an integral part of a long-term solution.

The Canadian International Development Agency (CIDA) will finance site preparation and basic infrastructure at an industrial estate to be located in the Diamond Hill area of St. Vincent. The Caribbean Development Bank will provide funding for the construction of factory shells in the new industrial estate. USAID will provide funding for about two miles of pipeline and a storage tank to insure daytime water delivery during periods when daytime demand exceeds daytime supply. The additional storage capacity will continue to serve the needs of the system after alternative supply sources are developed. CIDA is also expected to fund groundwater investigations and other studies required to define a long-term water supply solution for the area.

The existing industrial estate at Camden Park is near capacity, and space to construct additional factory shells is limited. The existing estate has also strained utility systems and residential housing in the area in which it is located. Developing a new industrial estate will permit the country to meet existing unfilled demand and provide room for expansion to meet future needs at the same time. It will also permit a more geographically balanced approach to industrial development.

Construction and follow-on maintenance of the storage and pipeline facilities to be funded by USAID will be undertaken by the Central Water and Sewer Authority (CW&SA), a parastatal corporation. This organization has shown improved financial performance in recent years. Two long-term technical advisors supported by the UNDP and recent additions to its engineering staff provide the organization with the capability to carry out the project.

While a full feasibility study of the industrial estate has not yet been conducted, a brief preliminary assessment indicates it is likely to fall within a range which permits an affirmative finding of feasibility to be made. Likewise, while no studies of long-term solutions to the Diamond Hill area's water supply problems have yet been carried out, there is reason to believe that such solutions can be found.

The Government wishes to proceed with construction of the estate in the near future to create job opportunities which might otherwise be lost. Assuming a satisfactory long-term solution to the water supply problem in the Diamond Hill area, the proposed interim solution will permit early initiation of the project. Nevertheless, given significant variations in yearly rainfall and other factors bearing on supply and demand for water in the area, the proposed interim solution may not be adequate to supply all users according to generally accepted international standards during the period prior to the implementation of a long-term solution. The decision to go forward with this project is one which attaches more importance to the likelihood of job creation benefits than to the possibility that water consumption standards may be compromised in the short-run.

The project agreement will contain a condition precedent to disbursement requiring the Government to submit a plan satisfactory to AID, for meeting the long-term water needs of Diamond Hill area - concentrating on detailed supply/demand investigations and studies.

The Agreement will also contain a covenant that the Government will conduct a technical/economic feasibility study for the Industrial park before initiation of construction of factory shells.

B. Subproject Description

This first amendment to the St. Vincent Infrastructure Project, Number 538-0138.07, will provide an additional \$567,000 to finance a water storage tank and pipeline to supply the proposed Diamond Industrial Estate (DIE). The facility will be designed and constructed by the Government of St. Vincent and the Grenadines (GOSVG) through the Central Water and Sewer Authority (CW&SA). Pipe, valves and fittings will be procured using formal competitive procedures. The Development Corporation (DEVCO) will manage the estate. DEVCO, which serves as an industrial and agricultural development corporation, an investment promotion agency, and a development finance institution, currently manages the existing industrial estate at Camden Park. The existing estate is approaching full utilization. The development of the DIE has been judged important to the continuing development of St. Vincent's industrial sector.

The GOSVG and the Canadian International Development Agency (CIDA) have held discussions over the past four years concerning CIDA's financing of the DIE. Norenc Associates Ltd., a Canadian consulting firm, prepared a design report and concept plan, dated January, 1987. On the basis of the NORENCO findings, CIDA is proceeding to finance detailed design and construction of the sites

and service requirements for developing an initial 22 acres of the planned 62 acre estate. The estimated cost of this CIDA project is CDN\$1.5 million. The GOSVG also has reached preliminary agreement with the Caribbean Development Bank (CDB) to finance construction of factory shells at the Diamond Industrial Estate.

Both the GOSVG and CIDA view the proposed AID-financed project as an interim measure to provide water to the estate until CIDA's intended expansion of water supply to southeast St. Vincent is realized.

Exhibit 1 shows the proposed site of the DIE, the approximate location of the existing water supply system, and the location of the proposed pipeline and storage tank.

C. Other Donor Roles

CIDA is presently assisting six Eastern Caribbean states in the water and sewerage sector and has indicated interest in providing further assistance to St. Vincent. Preliminary studies have been carried out regarding the feasibility of developing additional water sources to serve the southeast area and Kingstown. Discussions have been held with the GOSVG but groundwater investigations have not yet commenced.

The CDB has an active program of assistance to St. Vincent consisting mostly of feeder roads and factory shell construction. The CDB has indicated a willingness to utilize its St. Vincent and the Grenadines lending allocation for the construction of factory shells at DIE. A detailed appraisal will take place when the CIDA-financed DIE design is completed. The CDB has informally indicated that a water supply for the DIE is necessary before any assistance in factory shell construction can be granted.

D. Review of the NORENCO Study

The basic documents supporting construction of the DIE are the CIDA-financed Phase I and Phase II reports prepared by NORENCO Associates, Ltd.

The studies were titled (1) "St. Vincent Industrial Estates: The Potential" (Phase I) and (2) "Diamond Estate" (Phase II). Phase I included a review of St. Vincent's industrial performance, an inventory of potential investment sites and recommendations for future development of sites. This first report was reviewed by the GOSVG in the fall of 1985. NORENCO then proceeded with concept plans and cost estimates for the Diamond site as selected by the GOSVG. Neither of the two reports focused on the economic or financial justification for the DIE. The Phase II report dealt primarily with technical aspects of site development. The study did not contain a systematic analysis and projection of supply and demand for industrial real estate property in St. Vincent. It did, however, list four industries at Camden Park which were interested in expansion and eight new small industries having a need for 65,000 square feet of space. It also noted that there were a number of abandoned industrial sites in St. Vincent which were not currently being used. The report does say that Stage I of the industrial estate development (22 acres of land) "is designed to meet immediate demand".

NORENCO prepared concept plans for 62 acres with 39 industrial lots and 80 plus residential lots. Total factory space projected for the full industrial estate was 900,000 square feet. Preliminary layouts were prepared along with cost estimates of required infrastructure.

With respect to water needs, the report explicitly assumed that industries would be "dry". Water would not be used as an input for manufacturing or food processing. Only employees' personal needs for water consumption and sanitation would be provided. In addition, the site would also require water storage for fire control.

The NORENCO study reported underlying ambiguities in data on water consumption and recommended that area development studies be carried out to provide a better basis for development decisions. NORENCO recommended the installation of additional storage capacity as an interim measure for alleviating water shortages experienced by the area. The study made clear that additional sources of water were required for a long-term solution.

The study identified four possible sources of additional water:

- groundwater development in the Mesopotamia Valley (in the general area of existing Montreal Springs);
- a catchment reservoir on the Montreal River system;
- the Colnarie River; and
- the Yambour River.

NORENCO, however, noted that the four water supply sources identified were only possibilities and "need to be investigated and confirmed by further study"

The NORENCO study provided "only general ballpark figures" for three of the four water supply alternatives identified:

- groundwater development: EC\$3.0 million;
- a catchment reservoir in the Montreal River System: EC\$6.3 million; and
- Colnarie River: EC\$4.7 million.

Each of these estimates assumed that no treatment other than chlorination would be required. The groundwater development costs also assumed positive findings from an exploratory drilling and testing program. The catchment costs assumed positive findings from geological investigations. Each of the three cost estimates was for a water supply system to serve only the Diamond Industrial Estate of 92 acres and the proposed new residential area of 44 acres. The NORENCO report states:

If the source is to serve other existing developments (to be determined by the area development plan), the costs will have to be increased accordingly.

Of the four possible water sources identified in the NORENCO study, two are under active consideration. Groundwater development at the existing Montreal Springs is the favored solution. Discussions with CIDA have focussed on groundwater investigations to determine the adequacy of the source. However, there are no drilling rigs suitable for groundwater exploration on St. Vincent, so equipment and technicians will have to be brought to the island for this purpose. If satisfactory sources are found, it is possible that a long-term water supply solution could be in place within a year. It is even conceivable, but by no means certain, that production wells could be developed as an extension of a contract for test borings if early tests results prove affirmative. Should the Montreal Springs groundwater not prove adequate as a long-term solution, development of a system extension using the Colonarie River as a source could be several years away.

E. Assessment Logic and Methodology

1. AID Project Assessment Problem

AID is providing a relatively small "starter investment" in an interim water supply for an industrial estate. Development of the estate will permit the Government to maintain the momentum of its industrial development program. Other lending agencies and the Government will finance the remaining development costs. In the absence of this interim measure, delays in developing industrial estate land and infrastructure could result in the loss of opportunities to attract foreign investment. If so, the increased national income and economic growth resulting from those investments would be foregone.

The interim water supply to be financed by AID will be an integral part of larger investments in area water supply development and in the industrial estate. Hence the merits of the interim supply inevitably reflect the merits of the larger project. However, the relatively small size of AID's proposed investment does not justify a large expenditure on feasibility analysis by AID.

The capital cost of the interim water supply is estimated to be on the order of EC\$1.5 million. The estimated total capital cost of the full industrial estate is about EC\$165.0 million including both public and private investment in facilities and equipment. Of this total, public investment (land, utilities, factory shells) represents about \$31.5 million. Thus the cost of the interim water supply to be financed by AID represents about 5% of the public investment in the industrial estate and about 1% of the total investment.

The interim water supply improvement also represents a modest early step in a long-term investment program designed to provide solutions to the water supply problems of the area in which the Estate is located. A long-term water supply solution, if technically feasible, could certainly double or triple the water supply costs represented by the interim solution and conceivably could multiply them many times over.

Normally public investment decisions to locate an industrial park in an area of a country that has not previously had substantial industrial activity should be preceded by a combination of area development and industrial estate feasibility studies. Given the Government's urgency and the interest of other donors in funding the larger part of the program, the Mission is considering this initial interim step prior to completion of a full analysis of the larger investment.

The investment in an interim water supply for the industrial estate contains within it the seeds of all the issues pertaining to the industrial estate and to comprehensive planning for the area in which the industrial estate will be located. The interim water supply may be viewed as the camel's nose. The methodological challenge is to provide an assessment which is not disproportionate to the size of the camel's nose, but which nevertheless takes account of the dimensions and character of the entire camel.

2. Opportunity/Risk Assessment

a. Basic Concept

"Opportunity/Risk Assessment" is a rudimentary form of decision-analysis. Decision analysis is a technique which can be used to assess investment strategies in which decisions to commit resources may be appropriate in the absence of otherwise desirable levels of information. A time phased decision-tree is used to describe the branching pattern of possible future outcomes. Probabilities and values (costs and benefits) are applied at each of the branchings. The probabilities are multiplied by the values and discounted to present value. The technique forces quantification of intuitive judgments concerning future alternatives and outcomes. It permits comparisons of the outcomes of additional study with the likely outcomes of decisions made in the absence of more information and analysis: it takes into account the costs and benefits of additional study and the decision-maker's level of risk aversion. Decision-analysis can itself be quite expensive, and is normally used only in the case of large or complex strategic decisions.

The "Opportunity/Risk Assessment" used to analyze the interim solution identifies possible alternative outcomes of proceeding with an initial investment in the absence of full

feasibility studies of the industrial estate and long-term area water supply. It identifies the "critical path" leading to an outcome in which the industrial estate can be implemented with some success. It uses available and favorable key assumptions to test the possibility that favorable outcomes are attainable. It also identifies the risks associated with making the investment should the assumptions turn out to be unjustified.

b. Decision Logic

The basic elements of a "decision-tree" for the interim water supply are shown on Exhibit 2 on the following page. The favorable critical path starts on the lower left side of the page with (1) the present early assessment of the interim improvement. It then proceeds (2) to an area water supply study to determine the feasibility of supplying the industrial estate and the area's growing population on a long-term basis. Given a favorable outcome of such an investigation, the critical path leads to (3) an industrial estate feasibility study. Given a favorable outcome of such an investigation, the critical path leads to the implementation of the Industrial Estate "with some success".

Exhibit 2

INTERIM WATER SUPPLY IMPROVEMENT FOR DIAMOND INDUSTRIAL ESTATE
BASIC LOGIC OF OPPORTUNITY/RISK ANALYSIS

| | | |
|--------------|---------------------------------------|------------------------------|
| | Early Wet Years and All Late Years | ****Few Water Problems |
| | | * |
| | | * |
| | | * Industrial Estate |
| | ***** (4) | Implemented with |
| | * | " Some Success |
| | * | " |
| | * Early | " Serious Problems |
| | * Dry Years | " = =Until Long-Term |
| | * | Water Solution |
| | * | Implemented |
| | * | |
| | * | |
| | * | Industrial Estate |
| | * | Feasible |
| | * | |
| | * | |
| | ***** (3) | INDUSTRIAL ESTATE |
| | * | " FEASIBILITY STUDY |
| | * | " |
| | * | " |
| | * | " Industrial Estate |
| | * | " <u>Not</u> Feasible |
| | * | " |
| | * | " |
| | *Long-Term" | |
| | *Supply " | |
| | *Feasible " | |
| | * | == = = = = = = = = = == |
| EARLY | * | " |
| ASSESSMENT | * | " |
| (1)***** (2) | AREA WATER SUPPLY STUDY | " |
| OF INTERIM | " | " |
| IMPROVEMENT | " | " |
| | " | Industrial Estate <u>Not</u> |
| | "Long-Term | Successfully Implemented |
| | "Water Supply | But Some Benefits Obtained |
| | " <u>Not</u> Feasible | " |
| | " | " |
| | " | " |
| | == = = = = = = = = = == | |

The decision-tree shown in Exhibit 2 principally reflects the order and logic of analysis and decision, rather than order in which capital investments in fact will be made. The latter order, that of investment and construction is:

- (1) Interim Water Supply
- (2) Industrial Estate
- (3) Long-term Area Water Supply Solution

However, from the viewpoint of orderly analysis and decision-making, the question of the technical, financial, and economic feasibility of a long-term water supply solution is the first and most fundamental one. It makes no sense to locate an industrial estate in the Diamond area unless, during most of the project period, there will be a sufficient water supply for both the estate and the population on the estate will attract to the area.

Once it is determined that a long-term solution for the area exists, an interim water supply improvement intended to serve an industrial estate makes sense only if the industrial estate itself proves feasible.

Thus the order of analysis which would minimize the risk in going forward with the interim water supply improvement may be seen as follows:

- (1) Determine feasibility of meeting long-term area water needs.
- (2) Determine feasibility of industrial estate.
- (3) If (1) and (2) are affirmative: proceed with Interim Improvement.

However, there are two other considerations to take into account:

- Some benefits may be lost if investment is delayed by waiting for the results of extensive feasibility analyses.
- Some benefits will be derived from the interim water improvement even if a long-term water supply solution and an industrial estate do not prove feasible.

c. Favorable Outcomes

The "opportunity analyses" contained in Section II and Appendix A examine potential outcomes of water supply

studies, using readily available information and favorable assumptions. While the analysis is cast in the form of feasibility analysis, it does not reflect the substance of a feasibility study -- which requires validation of information sources and the reasonableness of key assumptions. What the analyses indicate is that a full study could find both investments feasible. Put another way, the available information does not lead to the conclusion that these investments are not feasible.

The term "with some success" is used to characterize the favorable outcome shown at (4) on Exhibit 2. The word some is used for three reasons:

(1) The interim water supply solution is ameliorative only. It cannot assure adequate water supply for the industrial estate and the people of the area in the early years before a long-term solution is implemented. Both households and the firms in the industrial estate may initially experience interruptions during the dry seasons of dry years.

(2) Financial returns to the water supply parastatal, CW&SA, are fairly close to the margin. They depend on fairly optimistic assumptions concerning the capital costs of the long-term water supply solution (at the low end of the range) and occupancy rates at the industrial estate (at the high end of the range).

(3) Financial returns to the industrial development parastatal, DEVCO, are negative. Like all other parastatals in the region which combine the functions of investment promotion and industrial estate operation, DEVCO is expected to require continuing subsidies. In the absence of region-wide agreement to raise industrial estate rental rates and/or to eliminate subsidies of organizations competing with DEVCO, this outcome cannot be easily overcome.

Indicative studies of water supply improvement and the industrial estate show favorable results when judged by public investment criteria (cost-benefit comparisons). These favorable results derive mainly from shadow pricing: low opportunity costs for labor employed by firms at the industrial estate and higher values for residential distribution of water than the rates presently charged by CW&SA.

d. Unfavorable Outcomes

If neither a long-term water supply solution nor an industrial park proves feasible, an increase in storage capacity would nevertheless be beneficial to the population in the area since it currently experiences dry season water shortages.

However, if the interim water supply were installed and plans for an industrial estate were then cancelled, the outcome would not be wholly satisfactory, as it would not fulfill the primary purpose of the project. It would be financially disadvantageous and could distort St. Vincent's national water development priorities. If the interim water supply and industrial estate infrastructure were installed and the project were then abandoned for lack of an adequate permanent water supply, resource misallocation would be far more serious.

e. Decision Strategy

The analysis presented in this paper demonstrates that the interim water supply, in combination with investments financed by other donors, could have significant beneficial results. It also identifies the risks that are implicit in proceeding with the investment in the absence of full information on water supply and industrial estate feasibility. Under these circumstances, the Mission will rely on the Government and on other development agencies to assure that subsequent investments in the program are technically, economically and financially feasible. Conditionality to be included in the Project Agreement is designed to encourage this result.

F. Principal Project Issues

The principal development institutions presently interested in funding development of the Diamond Industrial Estate are AID, CIDA, and CDB. Although the NORENCO reports made a start on identifying the issues of importance to industrial and water supply development in the project area, a satisfactory program of studies to resolve these and other pertinent issues has not yet been formulated and funded. The project agreement will require the Government to provide assurances, acceptable to AID, that it is pursuing plans to develop a scheme to meet the long-term water needs of the southeast area, including the industrial estate. The Agreement will also require the Government to covenant that a comprehensive feasibility study will be conducted prior to initiation of factory shell construction.

The conditions summarized above are designed to limit the most serious project risks. Nevertheless, there remains the possibility that the industrial estate and area water consumers may experience interruptions in supply during the dry seasons of early years in which rainfall is light. While these interruptions could be a source of inconvenience and loss of production and income, it is unlikely that they would create a health hazard. What is most likely to happen is that service to the project area -- which has generally been better than that prevailing in less developed regions of St. Vincent -- would decline for relatively short periods of time to a lower standard of supply. The resultant problems are more likely to be political than environmental. However, it is often the case that a developing society -- faced in advance with a choice between accepting a risk of temporary curtailments in utility services and losing opportunities for increased employment -- will choose to accept sacrifices in order to gain the benefits of increased income. Nevertheless, the Project Agreement will also require the Government to covenant that public health considerations will govern the distribution of water during extreme periods when demand exceeds supply.

III. TECHNICAL/ECONOMIC/FINANCIAL ANALYSES

A. Introduction

Since neither an area planning study nor a full feasibility study for the Diamond Industrial Estate has been conducted, only a preliminary economic analysis could be carried out to determine whether the water supply and industrial estate components of an area investment program would be feasible under favorable assumptions. A general explanation of project assessment logic and methodology is contained in Chapter 1. Costs are based on the CIDA funded NORENCO study and discussions with the water authority.

B. General Background on the Water Supply in the Area

The key issue concerning water supply for the Diamond area is that while the country is quite rich in water resources, present storage and distribution system is inadequate to meet the needs of the population even during the rainy season. A great proportion of the rainy season flow is lost due to the lack of adequate storage capacity. Any long term solution to the water problems of the area would require constructing major reservoirs or developing groundwater resources to meet the dry season shortfall.

The Government has proposed an interim measure to serve the industrial estate while a long term solution is being studied. The interim solution proposes capturing the nighttime discharge of the six inch pipeline that flows from the Montreal Spring northwest of Mesopotamia Valley. The nighttime flow would be stored in a tank for use the following day by the industrial estate. As demand estimates will demonstrate, however, this proposal can only be considered a temporary solution. The water flow in the Montreal Spring ranges from a high of 700,000 gpd in the rainy season to a low of 470,000 gpd at the lowest trough of the dry season, though during the very dry year, 1987, flow fell to 330,000 gpd. The average flow during a normal year can be taken to be in the 650,000 to 700,000 gpd range. The present demand in the area ranges from 400,000 to 600,000. Thus, there is very little surplus in the system as a whole. However because the nighttime flow is generally lost, additional storage capacity will somewhat ameliorate the situation. In the long run, however, a more permanent solution must be found.

The preliminary economic analysis makes the favorable assumption that a groundwater exploration program will be initiated and new production wells developed. The groundwater option was chosen for purposes of this analysis because CW&SA deems this to be the most attractive option among the various alternatives available. However, it must be noted that there has been only one exploratory borehole drilled to date and the quality and quantity of water available in the area has not been determined.

C. Demand Projections for Water in the Diamond Area

The base year for analysis is taken to be 1989. The projections shown in Table 3-1 have been made for twelve years beyond the base year, i.e., up to and including the year 2001. Various subcomponents of the demand have been analyzed, some of which have little to do with the industrial estate.

1. Demand for Water on the Estate

The key factors underlying demand for water on the estate is the number of workers employed and the need for fire control. The projections of the number of workers are based on the assumption that for every thousand square feet of factory shell space about 15 jobs are created. The methodology used to arrive at this figure is described in Appendix A which presents a pre-feasibility analysis of the estate as a whole.

It is assumed that the 40,000 square foot bakery begins operations in 1991 and the remainder of Phase I is developed over a ten year period. Based on the assumption that each worker consumes twenty imperial gallons a working day, the demand for water in the estate is expected to rise to about 135,000 gpd by the year 2001, including process water for the proposed bakery. Furthermore, water must be stored for firefighting. The NORENCO study recommends a fire flow of 500 imperial gallons per minute for a three hour duration. This amounts to 90,000 imperial gallons. A reserve tank of 90,000 imperial gallons will be built to store water for use in a fire emergency. This tank is assumed to need replenishment every ninety days, i.e. an additional 1000 gpd will be required for firefighting purposes from the beginning. Thus, the overall demand for water in the estate is expected to rise from about 42,000 gpd in 1991 to 136,000 gpd in 2001.

2. Residential Demand for Water

A key assumption underlying projections of domestic usage is that population growth will result solely from workers employed at the industrial estate and their families, i.e., about 90 persons employed in the estate will settle in the area with their families. The remainder will commute in and out of the area. The average household size is estimated to be 5. This figure is smaller

Table 3-1
 Projected Demand for Water from the Montreal System
 (In Imperial Gallons per Day)

| Year | Available Factory Shell Sq. Ft. | Industrial Estate | | | | Increases in Residential Water Demand | | Total Increase in Demand | Present Demand for Water from Montreal System | Total Daily Water Demand in Imperial Gallon |
|------|--|-------------------|-----------------|-----------------|------------------|---|--------|-----------------------------|---|---|
| | | No. of Workers | Water Demand | Fire Control | Process Water | New Cons. | Demand | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 450,000 | 450,000 | |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 450,000 | 450,000 | |
| 2 | 40,000 | 600 | 12,000 | 1,000 | 30,000 | 0 | 0 | 43,000 | 493,000 | |
| 3 | 65,000 | 975 | 19,500 | 1,000 | 30,000 | 0 | 0 | 50,500 | 500,500 | |
| 4 | 95,000 | 1,425 | 28,500 | 1,000 | 60,000 | 0 | 0 | 89,500 | 539,500 | |
| 5 | 95,000 | 1,425 | 28,500 | 1,000 | 60,000 | 450 | 18,000 | 107,500 | 557,500 | |
| 6 | 95,000 | 1,425 | 28,500 | 1,000 | 60,000 | 450 | 18,000 | 107,500 | 557,500 | |
| 7 | 125,000 | 1,875 | 37,500 | 1,000 | 60,000 | 450 | 18,000 | 116,500 | 566,500 | |
| 8 | 150,000 | 2,250 | 45,000 | 1,000 | 60,000 | 450 | 18,000 | 124,000 | 574,000 | |
| 9 | 175,000 | 2,625 | 52,500 | 1,000 | 60,000 | 450 | 18,000 | 131,500 | 581,500 | |
| 10 | 200,000 | 3,000 | 60,000 | 1,000 | 60,000 | 450 | 18,000 | 139,000 | 589,000 | |
| 11 | 225,000 | 3,375 | 67,500 | 1,000 | 60,000 | 450 | 18,000 | 146,500 | 596,500 | |
| 12 | 250,000 | 3,750 | 75,000 | 1,000 | 60,000 | 450 | 18,000 | 154,000 | 604,000 | |

than the current average household size in St. Vincent and the Grenadines, but historical studies of fertility have shown that the fertility rate among mothers working in industrial jobs tends to be much lower than the average. Consumption is estimated at 40 gpd. Using these data, and assuming development and occupation of the residential area by 1993, an additional 18,000 gpd will be required for domestic consumption.

3. Total Demand for Water

The present demand among existing households is about 450,000 gpd. Therefore, the capacity of the interim solution to supply both the needs of the estate and the population in the area will soon be exhausted. The minimum capacity of the tank proposed for the interim period should be 250,000 gallons, which will permit storage of two days requirement from the nighttime flow of the Montreal system.

The cost of a reserve water tank for fire protection was not included in the NORENCO estates. It is recommended that the estate include a 90,000 to 100,000 gallon reserve tank for this purpose. The cost has been included in the preliminary analysis of the estate presented in Appendix A.

D. Financial Viability of the Water Supply Component

The financial viability of the water supply component has been analyzed assuming that work on an artesian well system will start almost immediately after the interim system is in place. Work on the interim system is expected to start in 1989 and should be completed in 1990 with the installation of the 250,000 imperial gallon storage tank. Investigations leading to the long-term solution should start in 1990 and the project completed in 1992, including installation of an additional 300,000 imperial gallon storage tank. Another 300,000 imperial gallon tank is expected to be put in place by the year 1997.

The financial analysis shown in Table 3-2 is based on the cost figures developed by CW&SA for the interim system and the NORENCO estimate for the longer term artesian well system. The EC\$3 million estimate for the groundwater development scheme has been derived from the EC\$2.3 million estimate developed in the January, 1987, NORENCO study. Ten percent (10%) was added for engineering and 20% for inflation. The estimate of EC\$1.5 million for the interim solution was developed with CW&SA during preparation of this assessment. CW&SA also estimated the cost of storage tanks to be EC\$2.5 per gallon. This rate was used to establish the costs of storage tanks required for the artesian well system.

Table 3-2

Financial Analysis of Water Pipeline and Storage System to Diamond Area
(Thousands of EC Dollars at 1988 prices)

| | |
|---|---------|
| Industrial Users Water Charges in EC \$/1000 gal. | \$10.00 |
| Residential User Charges in EC \$/1000 gal. | |
| - 0 to 5,000 gal. | \$5.00 |
| - 5 to 15,000 gal. | \$8.00 |
| - Over 15,000 gal. | \$15.00 |
| Average Residential Rate used in this Analysis | \$6.00 |

| | |
|--|---------|
| Capital Investment Required in thousands of EC\$ | |
| - Pipeline from Montreal System | \$690 |
| - Initial Storage Tank of 200,000 gal. | \$650 |
| - Initial Testing and Study for Artesian Wells | \$500 |
| - Development of Artesian Well System | \$2,500 |
| - Additional Storage tanks of 300,000 gal. each | \$750 |
| - Other Water Supply Connections | \$1,000 |

Internal Rate of Return in Financial Prices 13.2%

Present Value of Costs \$6,207
Present Value of Revenues \$7,628

Benefit-Cost Ratio 1.23

| Year | Daily Water Demand in Imp. Gal. | | Capital Costs | | System Maint. Exp. & Overhead | Total Costs | Water Charge | Net Cash-Flow not incl. Interest |
|------|---------------------------------|--------|---------------|---------------|-------------------------------|-------------|--------------|----------------------------------|
| | Ind. | Resid. | Water Source | Storage Tanks | Other Connect. CWASA | | | |
| 1989 | | | 690 | | 50 | 740 | | -740 |
| 1990 | | 120000 | | 650 | 1000 | 1750 | 263 | -1487 |
| 1991 | | 120000 | | | | 100 | 263 | 163 |
| 1992 | 5375 | 129844 | 500 | | | 700 | 298 | -402 |
| 1993 | 36000 | 198750 | 2500 | 750 | | 3450 | 525 | -2925 |
| 1994 | 53500 | 238125 | | | | 200 | 655 | 455 |
| 1995 | 71000 | 277500 | | | | 200 | 785 | 585 |
| 1996 | 88500 | 316875 | | | | 200 | 915 | 715 |
| 1997 | 106000 | 356250 | | 750 | | 950 | 1045 | 95 |
| 1998 | 123500 | 395625 | | | | 200 | 1175 | 975 |
| 1999 | 141000 | 435000 | | | | 200 | 1305 | 1105 |
| 2000 | 158500 | 474375 | | | | 200 | 1435 | 1235 |
| 2001 | 176000 | 513750 | | | | 200 | 1565 | 1365 |
| 2002 | 176000 | 513750 | | | | 200 | 1565 | 1365 |
| 2003 | 176000 | 513750 | | | | 200 | 1565 | 1365 |
| 2004 | 176000 | 513750 | | | | 200 | 1565 | 1365 |
| 2005 | 176000 | 513750 | | | | 200 | 1565 | 1365 |
| 2006 | 176000 | 513750 | | | | 200 | 1565 | 1365 |
| 2007 | 176000 | 513750 | | | | 200 | 1565 | 1365 |
| 2008 | 176000 | 513750 | | | | 200 | 1565 | 1365 |
| 2009 | 176000 | 513750 | | | | 200 | 1565 | 1365 |
| 2010 | 176000 | 513750 | | | | 200 | 1565 | 1365 |
| 2011 | 176000 | 513750 | | | | 200 | 1565 | 1365 |
| 2012 | 176000 | 513750 | | | | 200 | 1565 | 1365 |
| 2013 | 176000 | 513750 | | | | 200 | 1565 | 1365 |
| 2014 | 176000 | 513750 | | | | 200 | 1565 | 1365 |

The overhead cost of CW&SA is expected to be about EC\$50,000 per year. Furthermore, as soon as the interim system is completed an additional EC\$50,000 overhead and maintenance (O&M) cost is expected. From 1992, when groundwater investigations are expected to commence, CW&SA O&M costs are expected to rise a further EC\$100,000 per year to a total of EC\$200,000 per year. These costs are associated with the Diamond area system alone. The total seems high but it assumes regular and steady maintenance to insure a reliable supply of water to the industrial estate.

Revenues are expected to accrue both from charges paid by industrial users and from charges paid by both new and existing residential users. Industrial users are expected to be charged the existing rate of EC\$10 per thousand gallons. Residential users are expected to pay on the graduated scale shown in Table 3-2. The average charge per thousand gallons is estimated to be EC\$6 per thousand gallons, assuming a household size of 4.5 and a thirty day month. Total revenues for the system are expected to rise to approximately EC\$1.6 million per year.

The net financial cash flow shown in Table 3-2 does not include interest charges. Based on this cash flow, the financial rate of return is estimated to be 13.2%. The rate at which CW&SA is able to borrow funds is 10%. Therefore, the Diamond Hill area water development project has a margin of financial viability using favorable assumptions.

E. Economic Rate of Return

Water charges in St. Vincent have been established to permit residential users consuming less than 5000 gallons a month to be subsidized by higher volume users. Thus, the financial rate of return underestimates the economic viability of the project from a public investment standpoint.

Assuming the EC\$10 per thousand gallons charged to industrial users to be more reflective of the economic benefit of the water supply to residential users, the economic rate of return has been calculated to be about 21.2% as reflected in Table 3-3. It could also be argued that the economic value of water to consumers should be assessed at the highest rate paid, EC\$15 per thousand gallons. This computation shown in Table 3-4 indicates an economic rate of return of about 31.2%.

Table 3-3

Economic Analysis of Water Pipeline and Storage System to Diamond Area
(Thousands of EC Dollars at 1988 prices)

| | |
|---|---------|
| Industrial Users Water Charges in EC \$/1000 gal. | \$10.00 |
| Residential User Charges in EC \$/1000 gal. | |
| - 0 to 5,000 gal. | \$5.00 |
| - 5 to 15,000 gal. | \$8.00 |
| - Over 15,000 gal. | \$15.00 |
| Average Residential Rate used in this Analysis | \$10.00 |

| | |
|--|---------|
| Capital Investment Required in thousands of EC\$ | |
| - Pipeline from Montreal System | \$690 |
| - Initial Storage Tank of 200,000 gal. | \$650 |
| - Initial Testing and Study for Artesian Wells | \$500 |
| - Development of Artesian Well System | \$2,500 |
| - Additional Storage tanks of 300,000 gal. each | \$750 |
| - Other Water Supply Connections | \$1,000 |

Economic Internal Rate of Return 21.2%

Present Value of Costs \$6,207
Present Value of Revenues \$11,481

Benefit-Cost Ratio 1.85

| Year | Daily Water Demand in Imp. Gal. | | Capital Costs | | System Maint. Exp. & Overhead | Total Costs | Water Charge | Net Cash-Flow not incl. Interest |
|------|---------------------------------|--------|---------------|---------------|-------------------------------|-------------|--------------|----------------------------------|
| | Ind. | Resid. | Water Source | Storage Tanks | Other Connect. | CWASA | | |
| 1989 | | | 690 | | | 50 | 740 | -740 |
| 1990 | | 120000 | | 650 | 1000 | 100 | 1750 | 438 |
| 1991 | | 120000 | | | | 100 | 100 | 438 |
| 1992 | 5375 | 129844 | 500 | | | 200 | 700 | 487 |
| 1993 | 36000 | 198750 | 2500 | 750 | | 200 | 3450 | 815 |
| 1994 | 53500 | 238125 | | | | 200 | 200 | 1003 |
| 1995 | 71000 | 277500 | | | | 200 | 200 | 1190 |
| 1996 | 88500 | 316875 | | | | 200 | 200 | 1378 |
| 1997 | 106000 | 356250 | | 750 | | 200 | 950 | 1565 |
| 1998 | 123500 | 395625 | | | | 200 | 200 | 1753 |
| 1999 | 141000 | 435000 | | | | 200 | 200 | 1940 |
| 2000 | 158500 | 474375 | | | | 200 | 200 | 2128 |
| 2001 | 176000 | 513750 | | | | 200 | 200 | 2315 |
| 2002 | 176000 | 513750 | | | | 200 | 200 | 2315 |
| 2003 | 176000 | 513750 | | | | 200 | 200 | 2315 |
| 2004 | 176000 | 513750 | | | | 200 | 200 | 2315 |
| 2005 | 176000 | 513750 | | | | 200 | 200 | 2315 |
| 2006 | 176000 | 513750 | | | | 200 | 200 | 2315 |
| 2007 | 176000 | 513750 | | | | 200 | 200 | 2315 |
| 2008 | 176000 | 513750 | | | | 200 | 200 | 2315 |
| 2009 | 176000 | 513750 | | | | 200 | 200 | 2315 |
| 2010 | 176000 | 513750 | | | | 200 | 200 | 2315 |
| 2011 | 176000 | 513750 | | | | 200 | 200 | 2315 |
| 2012 | 176000 | 513750 | | | | 200 | 200 | 2315 |
| 2013 | 176000 | 513750 | | | | 200 | 200 | 2315 |
| 2014 | 176000 | 513750 | | | | 200 | 200 | 2315 |

Table 3-4

Economic Analysis of Water Pipeline and Storage System to Diamond Area
(Thousands of EC Dollars at 1988 prices)

| ----- | | | | | | | | | |
|---|---------------------------------|--------|---------------|---------------|----------------|-------------------------------------|-------------|--------------|----------------------------------|
| Industrial Users Water Charges in EC \$/1000 gal. | | | | | | | | | \$10.00 |
| Residential User Charges in EC \$/1000 gal. | | | | | | | | | |
| - 0 to 5,000 gal. | | | | | | | | | \$5.00 |
| - 5 to 15,000 gal. | | | | | | | | | \$8.00 |
| - Over 15,000 gal. | | | | | | | | | \$15.00 |
| Average Residential Rate used in this Analysis | | | | | | | | | \$15.00 |
| ----- | | | | | | | | | |
| Capital Investment Required in thousands of EC\$ | | | | | | | | | |
| - Pipeline from Montreal System | | | | | | | | | \$690 |
| - Initial Storage Tank of 200,000 gal. | | | | | | | | | \$650 |
| - Initial Testing and Study for Artesian Wells | | | | | | | | | \$500 |
| - Development of Artesian Well System | | | | | | | | | \$2,500 |
| - Additional Storage tanks of 300,000 gal. each | | | | | | | | | \$750 |
| - Other Water Supply Connections | | | | | | | | | \$1,000 |
| ----- | | | | | | | | | |
| Economic Internal Rate of Return | | | | | | | | 31.2% | |
| Present Value of Costs | | | | | | | | \$6,207 | |
| Present Value of Revenues | | | | | | | | \$16,298 | |
| Benefit-Cost Ratio | | | | | | | | 2.63 | |
| ----- | | | | | | | | | |
| Year | Daily Water Demand in Imp. Gal. | | Capital Costs | | | System Maint. Exp. & CWASA Overhead | Total Costs | Water Charge | Net Cash-Flow not incl. Interest |
| | Ind. | Resid. | Water Source | Storage Tanks | Other Connect. | | | | |
| 1989 | | | 690 | | | 50 | 740 | | -740 |
| 1990 | | 120000 | | 650 | 1000 | 100 | 1750 | 657 | -1093 |
| 1991 | | 120000 | | | | 100 | 100 | 657 | 557 |
| 1992 | 5375 | 129844 | 500 | | | 200 | 700 | 724 | 24 |
| 1993 | 36000 | 198750 | 2500 | 750 | | 200 | 3450 | 1178 | -2272 |
| 1994 | 53500 | 238125 | | | | 200 | 200 | 1437 | 1237 |
| 1995 | 71000 | 277500 | | | | 200 | 200 | 1697 | 1497 |
| 1996 | 88500 | 316875 | | | | 200 | 200 | 1956 | 1756 |
| 1997 | 106000 | 356250 | | 750 | | 200 | 950 | 2215 | 1265 |
| 1998 | 123500 | 395625 | | | | 200 | 200 | 2475 | 2275 |
| 1999 | 141000 | 435000 | | | | 200 | 200 | 2734 | 2534 |
| 2000 | 158500 | 474375 | | | | 200 | 200 | 2993 | 2793 |
| 2001 | 176000 | 513750 | | | | 200 | 200 | 3253 | 3053 |
| 2002 | 176000 | 513750 | | | | 200 | 200 | 3253 | 3053 |
| 2003 | 176000 | 513750 | | | | 200 | 200 | 3253 | 3053 |
| 2004 | 176000 | 513750 | | | | 200 | 200 | 3253 | 3053 |
| 2005 | 176000 | 513750 | | | | 200 | 200 | 3253 | 3053 |
| 2006 | 176000 | 513750 | | | | 200 | 200 | 3253 | 3053 |
| 2007 | 176000 | 513750 | | | | 200 | 200 | 3253 | 3053 |
| 2008 | 176000 | 513750 | | | | 200 | 200 | 3253 | 3053 |
| 2009 | 176000 | 513750 | | | | 200 | 200 | 3253 | 3053 |
| 2010 | 176000 | 513750 | | | | 200 | 200 | 3253 | 3053 |
| 2011 | 176000 | 513750 | | | | 200 | 200 | 3253 | 3053 |
| 2012 | 176000 | 513750 | | | | 200 | 200 | 3253 | 3053 |
| 2013 | 176000 | 513750 | | | | 200 | 200 | 3253 | 3053 |
| 2014 | 176000 | 513750 | | | | 200 | 200 | 3253 | 3053 |

IV. INSTITUTIONAL ANALYSIS

A. Introduction

This section gives principal attention to the Central Water and Sewer Authority's capacity to carry out the construction of the interim water supply system. This subject is discussed in Section B below. In addition, a brief analysis of the main issues involved in the industrial estate development as a whole is included. Accordingly, Section C deals with the Development Corporation (DEVCO), the institution which will operate and maintain the Diamond Industrial Estate.

B. Central Water and Sewerage Authority

The Central Water and Sewerage Authority (CW&SA) will be responsible for the construction, operation, and maintenance of the pipeline and storage facilities described in previous sections of this report. While the GOSVG Central Planning Unit will serve as a channel for administrative communications with A.I.D., the implementing agency will be CW&SA.

CW&SA is a statutory authority organized under the Central Water and Sewerage Authority Act of 1978. It has its own Board of Directors. Within the Government, it is responsible to the Ministry of Health.

The basic function of CW&SA is to provide potable water and sewerage systems for households, communities, business establishments, and public facilities in St. Vincent and the Grenadines. Water charges account for the bulk of CW&SA's revenues, representing more than 90% of total income. Sewer charges, service connections, and other income represent relatively minor revenue sources.

Of CW&SA's 13,000 water customers, approximately 35% are metered and 65% are unmetered. Unmetered customers account for more than 75% of accounts receivable. However, the latter are much more likely to produce uncollectible receivables than are metered customers. CW&SA intends to have 100% of its customers metered by the end of 1991 and believes this objective to be realistically attainable. Metering will (1) reduce physical water wastage, (2) increase revenues, and (3) reduce financial losses from bad debts.

CW&SA has an accumulated deficit slightly in excess of EC\$6 million. The bulk of this deficit was registered in years prior to FY 1986. In FY 1985, the deficit was EC\$793,520. In FY 1986, following the approval of a revised rate structure, CW&SA had a surplus of EC\$216,358. In FY 1987, a year of record drought, a loss of EC\$7,443 was registered. FY 1988 returned to the 1986 pattern: net earnings amounted to EC\$237,014.

The Government has agreed to assume two long term loans previously carried on the books of CW&SA, a loan in the amount of EC\$3,150,000 (11% interest) from the National Commercial Bank and an interest-free loan from the Government of St. Vincent and the Grenadines in the amount of EC\$1,000,000. (The rationale for assumption of the loans is that the Government has refused to approve needed rate increases, thus forcing CW&SA to borrow to cover losses). As a result of the Government's action, CW&SA's annual interest costs will be reduced by more than EC\$300,000. Had Government assumed these loans three years earlier, CW&SA would have shown surpluses in excess of EC\$500,000 in 1986 and 1988 and a surplus approaching EC\$300,000 in 1987.

CW&SA does not follow formal public utility rate making principles which call for a "fair rate of return on investment". However, its revenues are intended to cover operating and maintenance costs. Considerations of social equity are taken into consideration in the rate structure. Funds loaned to the Government at concessional rates for purposes of water and sewerage improvements, e.g. CDB 4% loans, are passed on to CW&SA by the Government at 10%. There is a "gentlemen's agreement" that the resulting "spread" (6% in the case of the CDB loans) be used by Government to finance additional water and sewerage improvements, but there is no formal requirement that such capital funding match the accumulated excess on a dollar for dollar basis.

CW&SA presently has 212 employees, of which 167 are regular staff members and 45 are temporary employees. CW&SA retains temporary laborers for construction and other intermittent tasks. In recent years, the maximum number of temporary employees has been as follows:

| | |
|---------|-----|
| FY 1988 | 310 |
| FY 1987 | 346 |
| FY 1986 | 381 |

There have been recent periods in CW&SA's history in which engineering and supervisory personnel have been in very short supply, but such constraints appear to have been relieved for the present. The organization has four full-time engineers, two Vincentians and two expatriates provided under technical assistance agreements with the UNDP. The Authority also has an engineer in training. CW&SA's Manager is also a graduate engineer, but devotes substantial time to management activities.

The Authority's Manager holds a Bachelor of Science Degree in Civil Engineering from the University of the West Indies and a Master of Science Degree from the University of Oklahoma. Prior to joining CW&SA, he spent two years with the Trinidad Water and Sewer Authority. One of the local engineers has a Bachelor of Science

Degree from the University of Puerto Rico. He spent five years working on the Cumberland Hydroelectric Project prior to joining CW&SA. The second Vincentian engineer is a recent graduate of the University of the West Indies (Trinidad) in civil engineering. One of CW&SA's expatriate advisors received his Master's Degree in India. He was employed as a water engineer for eight years in Tanzania. The second advisor received a Master's degree in hydrology from the University of Sri Lanka and has had eight years of experience on water-related construction projects.

The CW&SA is presently constructing a 4-inch pipeline to serve the Sandy Bay area on the northeast coast of St. Vincent. Installation of about 3 miles of pipeline along the east coast road has been satisfactorily completed. CW&SA staff is presently installing the remaining pipe over steep, heavily forested terrain leading to the groundwater source about a mile inland. The pipeline rises and falls to the source which emanates from a rock cliff about 150 feet high. A retention basin, elevation 310 feet, has been constructed at the beginning of the pipeline. All excavation is by hand labor, including removal of boulders. Ductile iron pipe for the project was procured by the financing agency the Baptist Convention, and hand carried over the steep terrain. A treatment facility and 50,000 gallon storage tank is included in the project. The financier is disbursing funds (\$500,000) on a progress basis similar to USAID FAR procedures. Thus far, work has proceeded ahead of schedule. Site work is monitored full time by a CW&SA engineer. Regular site visits are made by CW&SA's Chief Engineer and a representative of the Baptist Convention. Design of the system was prepared by CW&SA and reviewed and approved by a qualified engineer employed by the Baptist Convention.

The work being carried out by the CW&SA is satisfactory. The Authority's performance, particularly in constructing the pipeline over difficult terrain, demonstrates its capacity to undertake installation of the pipeline for the Industrial Estate. Other projects currently being carried out by CW&SA include:

Fair Hall Water Supply Project:

| <u>Cost</u> | <u>Start Construction</u> | <u>Present Status</u> |
|--------------|---------------------------|---|
| EC\$350,000C | July 1988 | 90% complete. Will be completed during dry season |

Spring Village Water Supply Project:

| <u>Cost</u> | <u>Start Construction</u> | <u>Present Status</u> |
|-------------|---------------------------|----------------------------|
| EC\$400,000 | 1988 | To be completed March 1989 |

Georgetown/Byera Water Supply Project:

| <u>Cost</u> | <u>Start Construction</u> | <u>Present Status</u> |
|---------------|---------------------------|-----------------------|
| EC\$1,900,000 | Started Recently | Started Recently |

CW&SA does not contract out construction work. The Authority (1) recognizes that local contractors on St. Vincent and the Grenadines do not have the requisite skills and experience, e.g., CW&SA has the only qualified pipe fitters on the island; (2) believes offshore contractors are much more expensive (CW&SA reports that for a tender issued in 1988, the bids of offshore contractors came in at twice CW&SA's estimate; and (3) believes that offshore contractors are not able to complete projects any more expeditiously than CW&SA. As a result, excepting minor works awarded to local contractors, CW&SA has carried out all water-related construction in St. Vincent and the Grenadines.

C. Development Corporation

The Development Corporation (DEVCO) will have operational responsibility for managing the Diamond Industrial Estate. It is likely that DEVCO will also oversee construction of the estate infrastructure. The Government's Central Planning Unit normally has principal responsibility for handling communications with international lending agencies, in this instance the Canadian International Development Agency (CIDA) and the Caribbean Development Bank. On occasion, the Central Planning Unit is designated implementing agency, in which case it has operational responsibilities.

DEVCO is a statutory Government Corporation with its own Board of Directors. Within the government, it is responsible to the Ministry of Finance. The Corporation presently has three principal functions:

- (1) development finance;
- (2) investment promotion (it serves as St. Vincent's Industrial Development Corporation); and
- (3) management of the Camden industrial estate and certain other properties.

DEVCO has a staff of 12 persons. Professional staff include a general manager, director, accountant, two agricultural project officers, an industry officer, and an investment promotion officer. DEVCO is recruiting for four additional positions: a banking manager, senior loan officer, industrial estate supervisor (industrial engineer), and a technical maintenance specialist.

DEVCO was merged with the Agricultural Development Company in 1982. Liabilities, including arrears in loan payments came with the merger. Although conceived as a self-sustaining organization, DEVCO has experienced difficulties in generating sufficient income to cover expenses. The most acute problem has been arrears and defaults under DEVCO's loan portfolio (development financing function), particularly in loans to students and farmers. The Government has made contributions to the Corporation to deal with the shortfalls. DEVCO has recently employed a new and vigorous general manager with U.S. private sector experience and training in industrial promotion. He has won the respect of both DEVCO's clients and his colleagues in the region. As a result improved loan collections and increased organizational efficiency are anticipated.

Apart from the need to address DEVCO's problems on the development finance side and improve the general tone and efficiency of the organization, the key question for long term financial sustainability is whether the extent of concessionality in DEVCO's financing and its endowment of public lands is sufficiently realistic to cover the combination of less-than-commercial development functions with which it is charged. While an agency such as DEVCO can recover some costs of services associated with investment promotion, this function typically must be subsidized or cross-subsidized in some way. For a country in St. Vincent's stage of development, industrial estate rental rates must often compete with subsidized rates elsewhere. Student loans are typically not a commercially profitable activity. Likewise, in the absence of subsidized technical assistance and fully commercial rates of interest, loans to small businesses are not usually commercially profitable. The basic question for the long term is: "Given some implicit and explicit subsidies in its inputs and objectives, other than strictly commercial ones in providing its outputs, what kind of overall financial performance could reasonably be expected from DEVCO. As of December 31, 1987 (DEVCO's last audited annual statement) the corporation had an accumulated deficit of EC\$1,378,485. Annual net deficits have been registered since 1982. They reached a peak of EC\$825,624 in 1984, a year in which a substantial number of bad debts were written off, and have been declining since then. The net deficit in 1987 was EC\$86,487. Although there is evidence of increasing financial discipline, an analysis of DEVCO's financial statements indicates that the corporation may require periodic subsidies and/or infusions of capital for the foreseeable future. In the case of industrial estate operations, personnel, promotional, and operating/maintenance costs are likely to increase faster than revenues from rental of industrial estate space.

A.I.D. is currently providing direct assistance to DEVCO in the form of a \$40,000 grant for investment promotion activities. It is also providing assistance by financing the Eastern Caribbean

Investment Promotion Service (ECIPS) which assists the OECS countries in investment promotion efforts. The Corporation also receives assistance from the Caribbean Development Bank and the European Development Fund, both of whom are concerned with the financial viability of the organization. Presumably these organizations thus have ample motivation to monitor the financial performance of the Corporation. The CDB must also address issues relating to DEVCO's financial viability in its feasibility study of factory shell construction at Diamond Hill.

DEVCO's problems are long-standing and well known to international lending agencies in the region. At the heart of these problems are disparate functions and a lack of human and financial resources. An organizational study of DEVCO was carried out in 1985 by Coopers & Lybrand under the PDAP Project. A strategy (1986-1988) and operational plan (1986) for DEVCO were prepared by Coopers & Lybrand in 1986.

From a policy point of view, A.I.D. should not condition a water supply grant, implemented by CW&SA, on strengthening the organizational capabilities of DEVCO. Conceivably other international financing agencies would be in a better position to promulgate and follow-up on such conditionality.

V. SOCIO-ECONOMIC ISSUES

Four principal socio-economic issues have been considered. They include (1) the effects of the project on women, (2) area planning and feasibility issues, (3) regional equity and (4) subsidized competition.

A. Effects on Women

Exhibit 3 on the following page shows the composition of the labor force at Camden Park Industrial Estate by industry type. "Wet" industries are those which use water as part of the manufacturing or industrial process. "Dry" industries use water only for the personal needs of employees. As can be noted, a very large proportion (91%) of the employees of dry industries at Camden Park are women. A relatively small proportion (about 30%) of the employees of "wet" industries are women. The Diamond industrial estate will include cottage industry activity as well as employment on the industrial estate site itself. Many of the on-site employees at Diamond Hill will thus likely be young women entering the work force for the first time. It is sometimes argued that industries exploit workers, particularly young women who may be away from home for the first time. However, evidence in developing countries seems to indicate that economic benefits of industrial estates outweigh their social costs. Nevertheless, it is important for both workers and their families that the Government develop a regional plan for the area surrounding the estate and that it enforce measures designed to maintain the quality of life.

As discussed earlier in this report, there will be some risk of dry season water shortages in the project area, particularly if the first phase of the estate is filled up rapidly and rainfall is light during the years prior to the installation of an expanded water supply system. Past experience has shown water shortages to be an inconvenience rather than a health hazard, as water is rationed to avoid wastage. Should the interim water supply improvement be insufficient to supply the needs of both domestic consumers and employees at the industrial park, both groups will experience inconvenience. Any such interruptions will adversely affect women both as homemakers and as employees.

B. Area Planning and Feasibility Issues

The NORENCO study of the Diamond Industrial Estate states:

"This report is not intended to take the place of a thorough impact study... Under normal planning practice a further planning study should be carried out. Before the plan is put into action it should be studied from both an

interior and exterior point of view. The interior study should assess impact of the design itself including the effect on long-term development. The exterior study must deal with the impact that the designed land use will have on the surrounding area."

The study prepared by NORENCO did not include analysis or discussion of the project's impact on the existing villages of Belvedere and Brighton. Among the problems which could affect the area are a very substantial influx of workers and their families, new commercial enterprises, loss of recreational areas, strain on existing infrastructure and possible pollution of the river which is presently used for washing and bathing. The NORENCO report strongly recommended that:

".. proper waste treatment facilities must be included as part of the plans for the industrial park."

The NORENCO study, however, limited cost considerations to those associated directly with the industrial estate. Other hidden external costs which may be incurred as a result of carrying out the area development program are those related to:

- a. Road Widening and Intersection Control
- b. Water Supply and Sewage Treatment
- c. Access Control
- d. Policing
- e. Policy and Regulation Development
- f. Maintenance Considerations
- g. Solid Waste Collection and Disposal
- h. Environmental Protection and Pollution Control
- i. Fire Protection
- j. DEVCO Administration/Restructuring

The NORENCO study identified a range of possible benefits that could accrue from the industrial estate. However, no cost-benefit analysis was attempted. As indicated in the following section, the AID Project Agreement will contain a covenant which requires proper regional and industrial estate feasibility studies in advance of initiating construction of the first phase of the estate.

C. Regional Equity

With proper planning, the Diamond Industrial Estate will provide better regional balance for industrial activities in St. Vincent. At this time the area is better endowed with services and utilities than more remote areas of the country. Should the interim water supply improvement be installed but the industrial estate project abandoned, water supply in the area would be improved to

the benefit of the local populace. However, since the area is relatively well-served in comparison with other areas of the country, some imbalance in regional allocation of investment would result.

D. Subsidized Competition

In negotiating rental rates for factory space, DEVCO has in the past bargained away some or all of the financial surplus which it should derive from industrial estate operations. That practice, which well may be continued in the future, is common in a number of countries competing for foreign investment. A.I.D.'s Infrastructure for Productive Investment Project (IPIP) foundered in part because of industrial estate subsidization, i.e. investors did not come forward to invest in privately owned industrial estates because public monies were underwriting estates provided by governments. Although conditionality included in CDB loans for factory shells is designed to eliminate or reduce such subsidies, this conditionality has not always accomplished its intended objectives. Foreign investors usually do not regard rental rates as a dominant factor in selecting a country in which to locate. Some Caribbean countries for whom job creation is not an overriding consideration have been able to hold the line on rental rates. However, potential investors will press for every advantage they can receive, and a country with substantial unemployment can be placed under considerable negotiating pressure. St. Vincent and the Grenadines is such a country.

However, CW&SA, not DEVCO, will be responsible for implementing the water supply component of the project to be financed by A.I.D. It appears reasonably clear that the proposed water supply improvement will not itself require government subsidies. Indeed, it is conceivable that water revenues to be derived from the estate could be used to subsidize improvements to domestic water consumers. Conditioning water supply improvements on reforming practices with respect to industrial estate rentals would not appear to be very practical. The most effective way to deal with this issue is through the support of region-wide reform and through conditionalities attached to assistance provided directly to entities which operate industrial estates.

EXHIBIT 3

ESTIMATED COMPOSITION OF LABOR FORCE AT
CAMDEN PARK INDUSTRIAL ESTATE BY INDUSTRY TYPE

| <u>Organization</u> | <u>Women</u> | <u>Men</u> | <u>Total</u> | <u>Industrial Water Use</u> |
|--------------------------------|--------------|------------|--------------|---------------------------------|
| World Food Program | 4 | 8 | 12 | Dry |
| Venus Enterprises | 3 | 0 | 3 | Dry |
| St. Vincent Electronics | 76 | 2 | 78 | Dry |
| Duncan Furniture | 3 | 21 | 24 | Dry |
| Wilsons Sporting Goods | 243 | 244 | 487 | Wet |
| PICO | 158 | 4 | 162 | Dry |
| St. Vincent Children's Wear | 215 | 16 | 231 | Dry |
| St. Vincent Container Corp. | 4 | 59 | 63 | Wet |
| Island Glove | 88 | 5 | 93 | Dry |
| Flour Mill | 12 | 228 | 240 | Wet |
| East Caribbean Metals | 4 | 32 | 36 | Wet |
| Brewery | 6 | 55 | 61 | Wet |
| St. Vincent Bottles | 5 | 24 | 29 | Wet |
| Cariwear Ltd. | 70 | 5 | 75 | Dry |
| Bunler's Yachts | 5 | 11 | 16 | Wet |
| | | | | <u>% Women</u> |
| DRY INDUSTRIES | 617 | 61 | 678 | 91.0% |
| WET INDUSTRIES | 279 | 653 | 932 | 29.9% |
| TOTAL | 896 | 714 | 1610 | 55.7% |

VI. ENVIRONMENTAL ASSESSMENT

A. Background

The Diamond Hill Industrial Estate Water Supply Component of the St. Vincent Infrastructure Project (538-0138.07) is part of a multi-donor effort aimed at providing productive employment and improving the water supply in the Diamond Hill area of the Eastern Caribbean island nation of St. Vincent. A new industrial estate will be located in this area, providing jobs for local residents and attracting persons in need of employment from other parts of the country. AID will finance a 250,000 gallon water storage tank and a two mile pipeline to serve as an interim system for the industrial estate. This investment will amount to \$567,000, or approximately 1% of the total public and private investment in the industrial estate. The other major donors are CIDA and CDB. The proposed system will capture the nighttime flow of the six inch pipeline from the Montreal Springs northwest of Mesopotamia Valley. This flow, averaging 200,000 gallons per night, is generally lost. The project is being undertaken to permit development of the Diamond Industrial Estate while investigations continue to find a long-term water supply source. It is intended to provide a 1 to 3 year interim water supply.

B. Possible Impacts on the Man-Made Environment

In the original IEE a positive declaration was determined for the interim water supply component of the project because of concerns described below.

1. Direct Impact On The Man-Made Environment

The major adverse and direct impact on the man-made environment from the availability of an interim water supply results from the possible reduction in volume of water available for domestic use during extremely dry conditions.

Water from the Montreal System which serves the Diamond Hill area is supplied from a spring and other small streams. Flow averages about 600,000 gallons per day. However, flow has dropped to as low as 330,000 gallons per day during the dry season of a drought year. Current demand is about 450,000 gallons per day.

A biscuit factory now in the planning stages is scheduled to begin operation in 1991 at the Diamond Industrial Estate. The factory will require 78,000 gpd under full operation

for both production and sanitary needs. It will employ 600 hundred workers in three eight hour shifts. Prior to the availability of a long-term water supply the factory may be unable to operate at full capacity during the dry season and/or during very dry years in order to assure an adequate water supply for the domestic population. The interim water supply will also be the primary source of water for the infrastructure construction at the estate through the funding of the major donors CIDA and CDB.

Estimates are that the population in the urban area surrounding the Diamond Estate will increase by about 450 persons as a result of a residential area to be developed adjacent to the estate. Maximum demand should not occur until year five of the project, at which time a long term water supply should be on line.

CIDA plans to begin groundwater exploration as a potential long-term water supply in 1990 (see attached letter from GOSV to USAID). No additional industries will likely begin production until 1992 at which time factory shell installation will have commenced. Given this time frame and proper coordination between Government and donors, the interim water supply should have little direct impact on the man-made environment. If managed properly it will have a long-term beneficial impact by serving as the catalyst needed to promote industrial growth, provide employment and stimulate the economy of St Vincent.

2. Indirect Impacts On The Man-Made Environment

Indirect impacts on the man-made environment from USAID's involvement in the Diamond Hill Estate will not come directly from the construction of the interim water supply but indirectly from other donor activities and increased urbanization associated with development of the Estate. The major adverse long-term indirect impacts which will occur if no mitigation is undertaken are described below.

- o Possible limiting capacity of social and economic infrastructure to support an influx of new workers and their families including:
 - * Schools
 - * Electricity
 - * General Services
 - * Road widening and intersection control
 - * Access Control
 - * Policing
 - * Policy and Regulation Development

- * Maintenance Considerations
 - * Garbage Collection and Solid Waste
 - * Environmental and Pollution Control including sewage from the growing urban area
 - * Fire Protection
- o Possible pollution of the Ribishi River, which is presently used for bathing and washing, unless facilities are provided for proper treatment and disposal of solid and liquid wastes emanating from the estate.

USAID is a minor donor and has limited control over the indirect impacts associated with other donor financed activities. However, USAID does acknowledge a certain responsibility to minimize the risk to the man-made environment from these impacts since our contribution is the foundation for all following actions. As a result condition precedents and covenants, as part of the project agreement, will be used as a means of mitigation and enhancement.

C. Mitigation and Enhancement Measures to Impacts on the Man-Made Environment

USAID will include covenants and condition precedents in the project agreement with GOSVG which will assure minimal impact to the man-made environment. These include:

1. Water Supply. As a condition precedent to disbursement, the Project Agreement will require the Government to provide assurances, acceptable to AID, that it is pursuing plans to develop a scheme to meet the long-term water needs of the southeast area, including the Diamond Hill Industrial Estate. The Project Agreement will further require the Government to covenant that should water shortages be encountered in the interim period, distribution of water will be made on the basis of public health considerations.

2. Planning and Feasibility Studies. The project agreement will require the GOSVG to covenant that a study will be conducted prior to initiation of factory shell construction which (a) addresses the technical feasibility and financial and economic viability of the industrial estate and (b) describes area development planning required to insure adequacy of social and economic infrastructure.

3. Water-Using Industries. The project agreement will contain a covenant that no additional industries requiring water as an industrial input (excepting the already planned biscuit factory) will be permitted at Diamond Estate prior to installation of a water supply system to serve the long-term needs of the industrial estate

and the surrounding area. The Mission will work with CIDA and CDB to insure inclusion of similar conditions in their agreements with the Government.

4. Wastewater Disposal. The Project Agreement will require the GOSVG to covenant that sewage treatment and disposal systems for industries and homes located in the estate and the adjacent residential area will be designed in accordance with normally accepted standards to minimize risks of pollution.

Possible adverse, long term, irreversible impacts on the human environment from the industrial estate and increased urbanization of the area will be minimized if the above condition precedents and covenants are met.

5. Environmental Monitoring. Based on discussions with host country personnel, it is recommended that the new Environmental Management Support Project (538-0171) help to increase the capabilities of the Central Water and Sewage Authority to conduct routine environmental monitoring of drinking water, streams and the coastal zone. Water quality monitoring should be initiated in the Diamond River up and down stream of the industrial estate in order to assure that water quality in the river as the result of industrial or urban activities is of a nature that will not degrade the coastal zone. As an aside, the coral reefs on the leeward side of St. Vincent appear to be the healthiest observed to date in the Caribbean (Personal Observation REMS/C). Proper environmental monitoring will help to assure the preservation of these reefs in order to protect biological diversity in the region, act as a control to compare water quality against areas where coral reef is degraded and to assure the sustainability of the growing tourist industry which is in its infancy in St. Vincent.

D. Possible Impacts and Mitigation on the Natural Environment

1. Direct Impacts On The Natural Environment And Mitigation From The Interim Water Supply

The concern that arises regarding possible adverse impacts resulting from construction of the 2-mile pipeline and storage tank to be funded by USAID are from direct impacts on the natural environment.

Impacts resulting from the construction activity will be minimal and short-term in nature and will occur primarily during the pipe laying operation. The 6-inch pipeline will generally follow an existing road right-of-way and will therefore have no impact on critical habitat or wildlife. A ditch approximately two feet wide by about three feet deep requiring the movement of some 800 cubic yards of earth will be excavated along the two mile stretch of roadway. As pipe is placed, the trench will be backfilled

with the excavated material. Pipe laying will take place during the dry season to minimize the potential for erosion. The exposed earth will be reseeded with appropriate grasses once the project is completed.

The 250,000 gallon ground level water storage tank will be located on existing Government land. Construction of the tank will have no impact on the natural environment.

2. Indirect Impacts On The Natural Environment And Mitigation From The Interim Water Supply

If proper erosion control practices are implemented during laying of the pipeline, there should be no adverse indirect impacts on the natural environment from construction activities. USAID will work closely with the Government of St Vincent to assure that a proper erosion control program exists prior to construction activities associated with pipe laying as noted above under direct impacts.

There is no known critical habitat downstream of the spring from which water will be drawn and thus impacts in this area should be insignificant.

USAID will work closely with CIDA, CDB and the Government of St. Vincent to insure that all mitigative measures required are taken to maximize economic return to St. Vincent and the Grenadines while minimizing adverse impacts to the natural and man-made environments.

VII. FINANCIAL PLAN

A. Subproject Costs

A detailed estimate of the cost of the water supply system is shown in Table 7-1. Table 7-2 provides a revised budget for the St. Vincent Infrastructure Subproject by component and source of funding.

B. Methods of Implementation and Financing

Materials required for the 2-mile pipeline from the McCarthy water storage tank to Diamond Hill will be procured under a host country contract to be awarded following formal competitive bidding procedures. Payments will be made directly to the supplier by the RDO/C Controller's Office, 90% upon submission of a bill of lading indicating shipment has been made and the remaining 10% upon certification by the CW&SA that all materials have been delivered. Construction of the water storage tank and installation of the ductile iron pipe will be carried out by the CW&SA using force account procedures. Materials required for the reinforced concrete tank, primarily cement, aggregate, and reinforcing steel, will be procured locally by the Authority under expanded shelf item rules contained in the project authorization. The fixed amount specified in the agreement will include all material, labor, equipment, and overhead costs required to complete construction of the system. The following table summarizes methods of implementation and financing for each subproject activity.

| <u>ACTIVITY</u> | <u>METHOD OF IMPLEMENTATION</u> | <u>ESTIMATED AMOUNT</u> |
|--|--|-------------------------|
| Engineering Design | CW&SA | GOSVG Contribution |
| Procurement of Pipe, Valves and Fittings | Fixed Unit Price Host Country Contract with Direct Letter of Commitment to Supplier | \$187,500 |
| Pipe Installation/ Storage Tank Construction | Fixed Amount Reimbursement with CW&SA | \$379,500 |

C. Disbursement Schedule

Funds for the Diamond Hill water supply component of the St. Vincent Infrastructure Project are expected to be disbursed as follows:

| <u>FY89</u> | <u>FY90</u> | <u>FY91</u> |
|-------------|-------------|-------------|
| - | \$377,000 | \$190,000 |

TABLE 7-1

DETAILED COST ESTIMATE FOR DIAMOND INDUSTRIAL ESTATE
WATER SUPPLY

1. Pipeline

A. Materials

| <u>Item</u> | <u>Quantity</u> | <u>Unit Price</u> | <u>Total</u> |
|--------------------------------------|-----------------|------------------------|------------------|
| 6" Ductile Iron Pipe, Tyton Joint | 12,000 L.F. | \$ 10.00 | \$120,000 |
| Valves & Fittings | JOB | Lump Sum ^{1/} | <u>\$ 30,000</u> |
| | | Sub Total | \$150,000 |
| Freight, Insurance @ 25% | | | <u>37,500</u> |
| | | Sub Total | \$187,500 |

^{1/} 25% of Pipe Cost.

B. Labor and Equipment

| <u>Item</u> | <u>Quantity</u> | <u>Labor</u> | <u>Equip.</u> | <u>Total</u> |
|----------------------------|-----------------|--------------|---------------|-----------------|
| Excavation and Backfill | 12,000 L.F. | \$1.45 | \$2.00 | \$41,500 |
| Place and Joint | 12,000 L.F. | \$4.00 | - | <u>\$48,000</u> |
| | | | Sub Total | \$89,500 |

2. Storage Tank

| <u>Item</u> | <u>Quantity</u> | <u>Unit Price</u> | <u>Total</u> |
|--|--------------------|-------------------|------------------|
| Reinforced Concrete Ground Level Tank | 250,000 Gallons | \$290.000 | \$290,000 |
| | | Sub Total | <u>\$290,000</u> |
| | | TOTAL | <u>\$567,000</u> |

TABLE 7-2

REVISED FINANCIAL PLAN
ST. VINCENT INFRASTRUCTURE

| <u>SUBPROJECT COMPONENT</u> | (\$ 000) | | <u>GOSVG</u> | <u>TOTAL</u> |
|------------------------------|-----------------|------------------|------------------------|--------------|
| | <u>AID LOAN</u> | <u>AID GRANT</u> | | |
| 1. Road Rehabilitation | 1,340 | 433 | - | 1,773 |
| 2. Equipment Procurement | 500 | - | - | 500 |
| 3. Technical Assistance | 110 | - | - | 110 |
| 4. Maintenance Program | 50 | - | - | 50 |
| 5. Diamond Hill Water Supply | <u>-</u> | <u>567</u> | <u>50^{1/}</u> | <u>617</u> |
| TOTALS | \$2,000 | \$1,000 | \$50 | \$3,050 |

^{1/} CW&SA contribution for engineering design costs.

VIII. IMPLEMENTATION PLAN AND SCHEDULE

A. Implementation Plan

Engineering design of the water supply system for the Diamond Hill Industrial Estate will be undertaken by the Central Water and Sewerage Authority (CW&SA). The Authority has already prepared preliminary design computations (Appendix B) and conducted a route location survey to identify a tentative pipeline alignment. Following project authorization, the Authority will develop plan and profile drawings for the pipeline from which precise pipe quantities and valve and fitting requirements will be determined. Design of the 250,000 gallon reinforced concrete ground-level water tank will proceed simultaneously.

The USAID Office of Infrastructure and core contractor will assist CW&SA to develop tender documents for procurement of the materials required, including technical specifications. Formal competitive bidding procedures will be followed. The Office of Infrastructure will arrange for publication of an advertisement in the Commerce Business Daily soliciting bids for the pipe, valves and fittings. The CW&SA will evaluate the bids and make recommendations for the award of the supply contract. Recommendations will be endorsed by RDO/C prior to award.

Since (1) installation of the pipeline and construction of the water storage tank are not technically complicated, (2) there are no local contractors capable of undertaking the work, and (3) the project is not of sufficient size to attract offshore contractors, CW&SA will carry out this element of the program using force account procedures under a fixed amount reimbursement agreement with USAID. The institutional analysis notes several similar activities successfully undertaken by the Authority in the past. Materials required for the water storage tank (cement, aggregate, and reinforcing steel) will be purchased locally under shelf item procurement rules. Engineering personnel assigned to CW&SA will supervise construction activities. The FAR agreement will permit incremental advances to be made to CW&SA by the Controller's Office. Payments will be based on work completed as determined by the Project Officer.

The RDO/C Infrastructure Office has been assigned management responsibility for the St. Vincent Infrastructure Subproject. The Mission's Project Officer will conduct periodic site visits to inspect construction activities, assist in resolving technical and administrative problems which may arise during construction, prepare periodic status reports and approve payment vouchers.

B. Implementation Schedule

| <u>Activity</u> | <u>Target Date</u> | <u>Responsible Party</u> |
|---|--------------------|--------------------------|
| Project Authorization | 09/01/89 | RDO/C |
| Grant Agreement Signed | 09/15/89 | RDO/C/GOSVG |
| CP's Met | 10/30/89 | GOSVG |
| Engineering Design Completed | 11/30/89 | CW&SA |
| Construction of Water Tank Commences | 01/15/90 | CW&SA |
| IFB for Pipe Procurement Completed/Procurement Advertised | 02/28/90 | RDO/C/CW&SA |
| Bids Received | 04/15/90 | Pipe Suppliers |
| Procurement Contract Awarded | 05/30/90 | RDO/C/CW&SA |
| Pipe, Valves, and Fittings Delivered | 11/30/90 | Supplier |
| Pipe Installation Commences | 12/30/90 | CW&SA |
| Storage Tank Completed | 01/15/91 | CW&SA |
| Pipe Installation Completed | 06/30/91 | CW&SA |

IX. CONDITIONALITY

The project agreement will contain conditionalities and/or covenants relating to (1) a long-term water supply plan; (2) planning and feasibility studies; (3) water-using industries; and (4) wastewater disposal..

A. Water Supply

As a condition precedent to disbursement, the Project Agreement will require the Government to provide assurances, acceptable to AID, that it is pursuing plans to develop a scheme to meet the long-term water needs of the southeast area, including the Diamond Hill Industrial Estate. The Project Agreement will further require the Government to covenant that should water shortages be encountered in the interim period, distribution of water will be made on the basis of public health considerations.

B. Planning and Feasibility Studies

The project agreement will require the GOSVG to covenant that a study will be conducted prior to initiation of factory shell construction which (a) addresses the technical feasibility and financial and economic viability of the industrial estate and (b) describes area development planning required to insure adequacy of social and economic infrastructure.

C. Water-Using Industries

The project agreement will contain a covenant that no additional industries requiring water as an industrial input (excepting the already planned biscuit factory) will be permitted at Diamond Estate prior to installation of a water supply system to serve the long-term needs of the industrial estate and the surrounding area. The Mission will work with CIDA and CDB to insure inclusion of similar conditions in their agreements with the Government.

D. Wastewater Disposal

The Project Agreement will require the GOSVG to covenant that sewage treatment and disposal systems for industries and homes located in the estate and the adjacent residential area will be designed in accordance with normally accepted standards to minimize risks of pollution.

APPENDIX A

A Preliminary Economic Analysis of Diamond Industrial Estate
in St. Vincent and the Grenadines

A Preliminary Economic Analysis of Diamond Industrial Estate
in St. Vincent and the Grenadines

A. Introduction

Since a full feasibility study of the Diamond Industrial Estate has not yet been conducted, a preliminary economic analysis was carried out to determine whether the industrial estate component of an area development program would be feasible under favorable assumptions. A general explanation of project assessment logic and methodology is contained in Section I.

B. Conceptual Framework for Feasibility Study

The principal benefit accruing to the country from investment in any developmental project must be measured in terms of incremental contribution to Gross Domestic Product. Most industries locating in the Eastern Caribbean are doing so to take advantage of the Caribbean Basin Initiative (CBI) and lower labor costs relative to North America. Thus, the in-country value added in these manufacturing operations is almost always the value of labor. Since most of the workers in these operations tend to be unskilled when recruited, the incremental value added to the country must be measured as the difference between the wages and benefits paid to these workers and the opportunity cost of unskilled labor.

It has been assumed that DEVCO is going forward with the investment in the estate because there is existing demand for factory shell space both from those firms already operating within the country and other potential investors. Visits to three typical industries located in the existing Camden Industrial Estate confirm that belief. The managers of all three plants indicated they would like more space. Such statements are of course not commitments and the demand for factory shell space in the country will depend ultimately on the state of the global market and the framework of trade policies prevailing in that market.

C. The Economic Impact of the Industrial Estate

The economic impact of industrial estate development is measured by two criteria. First, the incremental value added and second, the number of jobs created. Both are very important in a country like St. Vincent where the unemployment rate is said to hover around the forty per cent level following the decline of the sugar industry.

The Government of St. Vincent and the Grenadines working through DEVCO plans to focus on attracting five different types of industry to the country: garments, electronics, sporting goods,

toys and data processing. Among these, the first three are represented in the existing industrial estate at Camden. Data gathered on visits to St. Vincent Sporting Goods (a Division of Wilson), St. Vincent Children's Wear and St. Vincent Electronics were used to assess the impact of these industries on the economy of St. Vincent. The results are presented in Appendix Table 1. The opportunity cost of labor was taken to be 70% of the minimum wage for factory employees and 20% percent of the minimum wage for offsite employees. The latter were expected to be able to carry out most of their normal pre-employment activity because they are working at home. Contributions to GDP were estimated by taking total labor earnings and adding ten percent for in-country management expenses. The estimated value of the opportunity cost of labor was subtracted from this total to derive the incremental value added. The total for each industry was converted to value added per square foot to give an idea of the impact of an investment in industrial estates on the economy of St. Vincent and the Grenadines.

The results in Appendix Table 1 show that the garment industry has the greatest impact per square foot of factory shell investment. Likewise, with its wide network of home workers, this industry also has the largest impact on employment. However, the average wage in the sporting goods industry is the highest, and workers with higher disposable incomes create a greater demand for goods and services, and, consequently, other employment. However, industry preference cannot be based solely on these two criteria. There is a need for diversity to reduce the risk of a downturn in any particular industry due either to changes in global market conditions or to changes in global trade regulations. It would be good strategy to continue to build on the diversified base that has already been created in St. Vincent.

Management of the industries visited cited a willingness to expand their presence on the island. The only major problem identified was inadequate air transport. However, there is a proposal under the USAID funded HIAMP project to develop a Ro-Ro ferry (i.e. ferries onto which container trucks can drive on and off) system between St. Vincent, Barbados and Grenada. Should this project reach fruition, the major problem cited by off-shore industrial investors in St. Vincent will be eliminated.

D. Preliminary Economic Analysis for the Industrial Estate

The preliminary analysis of the economic viability was carried out using probable and favorable assumptions. The results shown in Appendix Table 2 do not represent a finding of feasibility and should be treated as indicative only.

1. Cost Estimates

The cost estimates used here are based on the CIDA-NORENCO study though some modifications were made. The budget allocation made by CIDA requires that a smaller estate be built than the one originally envisaged. Thus, the original cost estimates have been prorated. Though the CDB has budgeted resources for the area of factory shells originally planned, only a 250,000 sq.ft. estate is currently envisaged. However, infrastructure will be designed to permit expansion to 600,000 sq. ft. when resources permit. The additional funds may be required to develop a permanent solution to the water problem in the area. Once the water situation is resolved, the estate area may easily be expanded.

The basic estate infrastructure is expected to cost about EC\$6 million. This is the prorated estimate derived from the NORENCO study. A further EC\$500,000 will be required for firefighting infrastructure. Factory shells are expected to cost about EC \$ 100/sq.ft. as estimated in the study. Factory shell construction is expected to proceed at 25,000 sq.ft. per year and to be allocated as soon as available. An allowance of EC\$500 per square foot has been allowed for machinery, other equipment and furniture requirements. While these costs will be borne by the investors and not by DEVCO, the investment must be included in assessing economic viability.

Water supply cost estimates have been described earlier in Chapter 2. Land cost have been estimated at EC\$15,000 per acre even though the land has been vested in DEVCO and does not need to be purchased. It is, nevertheless, important for the purposes of economic analysis.

Site maintenance and DEVCO administrative overhead costs are expected to start at a base of EC\$100,000 and increase by \$1/sq.ft. per year. Furthermore, additional wear and tear will be generated on the approximately ten miles of roads that will provide access to the estate. The average annual maintenance cost per mile has been estimated to be about EC \$26,000 per mile, of which 10% is attributable to the heavy loads generated by estate activity. Thus on the approximately ten miles of roads that will be used by vehicles from the estate, added maintenance cost is estimated to be EC\$25,000 per year.

2. Benefits

The primary benefit is expected to result from incremental value added. Manufacturers are expected to start operations on the estate as soon as shell space is available. The year after completion, space will be 25% occupied, becoming fully operational the following year. The average value added per square foot is estimated to be EC\$172 which is based on the average of the three industries described in Appendix Table 1.

Additional benefits will accrue in terms of rents for factory space and water charges. The cost of electric connections has not been included and electricity charges are not reflected in the benefits. Rent has been estimated to average EC\$8 per square foot which is the official DEVCO rate. DEVCO has granted rental concessions to present occupants at Camden Estate and is expected to continue granting such concessions to industries that may wish to locate in the proposed Diamond Estate.

3. Economic Viability

The economic rate of return is expected to be about 20% percent as reflected in Appendix Table 2. Furthermore, about nine hundred jobs are expected to be initially created on the estate. Other off site jobs will also be created to provide services to the estate and its employees.

4. Financial Viability

A tentative attempt was made to assess financial viability. Costs include direct DEVCO investments to develop the site and the factory shells. Costs also include DEVCO overhead related to the estate, as well as operations and maintenance of the estate. The grant to be given by CIDA is excluded from the DEVCO costs. Revenue is rent paid on the factory shells. Even though the official rate is EC\$8/per sq.ft., DEVCO has been forced to compete with other Eastern Caribbean countries through rent subsidies; therefore, the financial internal rate of return as shown in Appendix Table 3 is in the negative range at 2%. DEVCO has previously received CDB funds at 4%. The new special fund lending rate is 2%. If DEVCO receives that rate, then the project will break even financially; if not, it will lose money. However, in view of the benefits accruing to the economy in terms of incremental value added and employment, the estate would still appear to be profitable investment. However, as long as the industries remain tax exempt, DEVCO will need to be subsidized from general revenues, as are most other Eastern Caribbean industrial development organizations.

The discrepancy between the economic and financial rates of return reflects not only the CIDA grant but also that the only revenue used in the financial analysis is rental receipts. Benefits used in the economic analysis include both rental receipts as well as estimates for incremental value added.

E. Conclusions

Based on this rather tentative analysis and favorable assumptions, the public investment in the Diamond Industrial Estate appears to be attractive on the basis of incremental value added. On purely financial grounds it is not a viable proposition for DEVCO. The decision to carry through with the project thus is based on its economic viability. DEVCO's operating costs will need to be subsidized by the Government. The project is economically beneficial and there is a proven need. The lack of financial viability springs primarily from the competition among various Eastern Caribbean countries to attract foreign investors through tax breaks and rent subsidies.

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Appendix Table 1

Contributions to Local Economy by Selected Industries in Camden Estate
(All Figures in East Caribbean Dollars unless otherwise noted)

| Type of Industry | Garment | Electronic Part | Sporting Goods |
|------------------------------|----------------------------|---------------------------|------------------------------|
| Name of Unit | St.Vincent Childrenwear | St.Vincent Electronics | St.Vincent Sporting Goods |
| Floor Space in Sq. Ft. | 24,000 | 3,000 | 53,000 |
| Rental Paid | \$121,200 | \$329,496 | \$318,000 |
| Number of Employees | | | |
| - Factory Site | 210 | 85 | 487 |
| - Home | 1,300 | 16 | 0 |
| - Sq.ft./Employee | 16 | 30 | 109 |
| - Employee/1000 Sq.Ft. | 63 | 34 | 9 |
| - Onsite emp./1000 Sq.Ft. | 9 | 28 | 9 |
| Estimated Labor Earnings | | | |
| - Wages | \$6,162,000 | \$359,320 | \$3,798,600 |
| - Benefits | \$32,760 | \$13,260 | \$75,972 |
| - National Insurance | \$11,357 | \$4,597 | \$26,337 |
| Opportunity Cost of Labor | \$1,100,528 | \$169,541 | \$921,794 |
| Contributions to GDP | | | |
| - Total | \$5,859,520 | \$607,799 | \$3,719,006 |
| - Per Square Ft. | \$244 | \$203 | \$70 |

Notes:

1. Contributions to GDP assumed to be 10% over and above the sum of wages, benefits, and rental payments
2. Employee per 1000 square feet reflects the employment generated by investment in a thousand square feet of factory shell.

APPENDIX TABLE 2

Economic Flow Analysis of Diamond Estate

| | | | | | | | | | | | |
|---|---------------------------|---------------------|-------------------------|------------|------------|------------------------|--------------|--------------------|--------------|----------|-------------|
| Costs of Basic Sites and Services in thousands of EC \$ | 5948 | | | | | | | | | | |
| Costs for Interim Water Main & Tank in thousands of EC \$ | 2500 | | | | | | | | | | |
| Costs of Factory Shell per Square Foot in EC \$ | 100 | | | | | | | | | | |
| Costs of Other Equipment and Infrastruc.per Sq Ft in EC \$ | 500 | | | | | | | | | | |
| Maintenance Costs per Square Foot in EC \$ | 1 | | | | | | | | | | |
| Costs of Fire Protection Infrastructure on Estate(EC \$'000 | 500 | | | | | | | | | | |
| Rental Rate per Square Foot in EC \$ | 8 | | | | | | | | | | |
| Contribution to GDP per Square Foot in EC \$ | 172 | | | | | | | | | | |
| Employment per Thousand Square Foot | 35 | | | | | | | | | | |
| ----- | | | | | | | | | | | |
| Economic IRR for Project | 20.0% | | | | | | | | | | |
| Present Value at 10% | | | | | | | | | | | |
| - Costs | 83222 | | | | | | | | | | |
| - Benefits | 159223 | | | | | | | | | | |
| Benefit-Cost Ratio | 1.91 | | | | | | | | | | |
| ----- | | | | | | | | | | | |
| Year | Avail. Fact. Shell Sq.Ft. | Indus. Water Demand | Capital Costs Land Cost | Water Sup. | Other Site | Site Maint. Nat. Infr. | DEVCO Admin. | Benefits Rent Inc. | Water Charge | Inc. GDP | Net Benefit |
| 1989 | | | 930 | 2500 | | | 25 | | | | -3455 |
| 1990 | | | | | 6448 | | 25 | | | | -6473 |
| 1991 | | | | | 2500 | | 25 | | | | -2525 |
| 1992 | 25000 | 5375 | | 500 | 15000 | 25 | 50 | 200 | 13 | | -15362 |
| 1993 | 50000 | 36000 | | 3250 | 15000 | 25 | 150 | 400 | 90 | 1075 | -16860 |
| 1994 | 75000 | 53500 | | | 15000 | 25 | 175 | 600 | 134 | 5375 | -9091 |
| 1995 | 100000 | 71000 | | | 15000 | 25 | 200 | 800 | 178 | 9675 | -4573 |
| 1996 | 125000 | 88500 | | | 15000 | 25 | 225 | 1000 | 221 | 13975 | -54 |
| 1997 | 150000 | 106000 | | | 15000 | 25 | 250 | 1200 | 265 | 18275 | 4465 |
| 1998 | 175000 | 123500 | | | 15000 | 25 | 275 | 1400 | 309 | 22575 | 8984 |
| 1999 | 200000 | 141000 | | | 15000 | 25 | 300 | 1600 | 353 | 26875 | 13503 |
| 2000 | 225000 | 158500 | | | 15000 | 25 | 325 | 1800 | 396 | 31175 | 18021 |
| 2001 | 250000 | 176000 | | | 12500 | 25 | 350 | 2000 | 440 | 35475 | 25040 |
| 2002 | 250000 | 176000 | | | | 25 | 350 | 2000 | 440 | 39775 | 41840 |
| 2003 | 250000 | 176000 | | | | 25 | 350 | 2000 | 440 | 43000 | 45065 |
| 2004 | 250000 | 176000 | | 500 | | 25 | 350 | 2000 | 440 | 43000 | 44565 |
| 2005 | 250000 | 176000 | | | | 25 | 350 | 2000 | 440 | 43000 | 45065 |
| 2006 | 250000 | 176000 | | | | 25 | 350 | 2000 | 440 | 43000 | 45065 |
| 2007 | 250000 | 176000 | | | | 25 | 350 | 2000 | 440 | 43000 | 45065 |
| 2008 | 250000 | 176000 | | | | 25 | 350 | 2000 | 440 | 43000 | 45065 |
| 2009 | 250000 | 176000 | | | | 25 | 350 | 2000 | 440 | 43000 | 45065 |
| 2010 | 250000 | 176000 | | | | 25 | 350 | 2000 | 440 | 43000 | 45065 |
| 2011 | 250000 | 176000 | | | | 25 | 350 | 2000 | 440 | 43000 | 45065 |
| 2012 | 250000 | 176000 | | | | 25 | 350 | 2000 | 440 | 43000 | 45065 |
| 2013 | 250000 | 176000 | | | | 25 | 350 | 2000 | 440 | 43000 | 45065 |
| 2014 | 250000 | 176000 | | | | 25 | 350 | 2000 | 440 | 43000 | 45065 |

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APPENDIX TABLE 3

Financial Viability Analysis of the Diamond Estate

| | |
|--|-------|
| Costs of Basic Sites and Services in thousands of EC \$ | 5948 |
| Costs for Interim Water Main & Tank in thousands of EC \$ | 2500 |
| Costs of Factory Shell per Square Foot in EC \$ | 100 |
| Costs of Other Equipment and Infrastruc.per Sq Ft in EC \$ | 500 |
| Maintenance Costs per Square Foot in EC \$ | 1 |
| Costs of Fire Protection Infrastructure on Estate(EC \$'000) | 500 |
| Rental Rate per Square Foot in EC \$ | 8 |
| Contribution to GDP per Square Foot in EC \$ | 172 |
| Employment per Thousand Square Foot | 35 |
| <hr/> | |
| Financial IRR for Project | 2.0% |
| Present Value at 10% | |
| - Costs | 14434 |
| - Benefits | 8478 |
| Benefit-Cost Ratio | 0.59 |

| Year | Avail. Fact. Shell Sq.Ft. | Estate Development Costs | Site Maint. & DEVCO Admin. | Total Cost to DEVCO excluding CIDA Grant | Rental Revenues for DEVCO | Net Benefit |
|------|------------------------------------|--------------------------------|--|--|------------------------------------|----------------|
| 1989 | | | 25 | 25 | | -25 |
| 1990 | | 6448 | 25 | 25 | | -25 |
| 1991 | | 2500 | 25 | 2525 | | -2525 |
| 1992 | 25000 | 2500 | 50 | 2550 | 200 | -2350 |
| 1993 | 50000 | 2500 | 150 | 2650 | 400 | -2250 |
| 1994 | 75000 | 2500 | 175 | 2675 | 600 | -2075 |
| 1995 | 100000 | 2500 | 200 | 2700 | 800 | -1900 |
| 1996 | 125000 | 2500 | 225 | 2725 | 1000 | -1725 |
| 1997 | 150000 | 2500 | 250 | 2750 | 1200 | -1550 |
| 1998 | 175000 | 2500 | 275 | 2775 | 1400 | -1375 |
| 1999 | 200000 | 2500 | 300 | 2800 | 1600 | -1200 |
| 2000 | 225000 | 2500 | 325 | 2825 | 1800 | -1025 |
| 2001 | 250000 | | 350 | 350 | 2000 | 1650 |
| 2002 | 250000 | | 350 | 350 | 2000 | 1650 |
| 2003 | 250000 | | 350 | 350 | 2000 | 1650 |
| 2004 | 250000 | | 350 | 350 | 2000 | 1650 |
| 2005 | 250000 | | 350 | 350 | 2000 | 1650 |
| 2006 | 250000 | | 350 | 350 | 2000 | 1650 |
| 2007 | 250000 | | 350 | 350 | 2000 | 1650 |
| 2008 | 250000 | | 350 | 350 | 2000 | 1650 |
| 2009 | 250000 | | 350 | 350 | 2000 | 1650 |
| 2010 | 250000 | | 350 | 350 | 2000 | 1650 |
| 2011 | 250000 | | 350 | 350 | 2000 | 1650 |
| 2012 | 250000 | | 350 | 350 | 2000 | 1650 |
| 2013 | 250000 | | 350 | 350 | 2000 | 1650 |
| 2014 | 250000 | | 350 | 350 | 2000 | 1650 |

56'

APPENDIX B

CW&SA Preliminary Design and Cost Calculations

DIAMOND INDUSTRIAL ESTATE

WATER SUPPLY PROJECT

PRELIMINARY DESIGN:

1.0: WATER SUPPLY AND DEMAND ANALYSIS:

EXISTING SYSTEM CAPACITY

- 1.1) Existing main size = 6" (150mm) D.I.
 Length of the main upto Mc. Carty = 29,900 ft.
 Difference in elevations between Intake and tank point at Mc Carty = $1420 - 500$ ft = 920 ft.

Assuming a Residual head of 5m (=16.4 ft) at the tank point; The allowable head loss in the section = $1420 - 516.4 = 903.6$ ft.

This represents $\frac{h_f}{L} = \frac{903.6}{29,900} = 0.0302$

Given $\frac{h_f}{L} = 0.0302$

$\phi = 6''$ (150mm)

and assuming $k_s = 0.06$ [Colebrook-White equation]

Expected: $Q_{full} = 39.525$ l/sec with corresponding

$V_{full} = 2.237$ m/sec.

$Q_{full} = \frac{39.525 \times 3600}{4.5464} \text{ gpd.} = 31,620 \text{ gpd.}$

$= 758,550 \text{ gpd.}$

$= 31,620 \text{ gpd.}$

1.2) EXISTING SYSTEM DEMAND

Population being served = 7,000 + 4,500 people
 = 11,500 people

no (Belmont, Mc. Carty, Stubbs, Brighton, Prospect, Calligan and Calder = 1000 people)

Assuming per capita average consumption = 30 gpd.

$$\text{Total Daily Consumption} = 30 \text{ gpd} \times 11,500 = 345,000 \text{ gallons/day}$$

Assuming a peak factor of 4, the above consumption is at $345,000 \text{ gpd}$

$$= \frac{345,000 \text{ gpd}}{6 \text{ hrs}} = 57,500 \text{ gph}$$

2.0 STORAGE REQUIREMENT:

$$\text{Inflow} = 31,620 \text{ gph}$$

$$\text{Outflow} = 57,500 \text{ gph}$$

$$\text{Deficit per hr} = 25,880 \text{ gallons/hr for 6 hrs}$$

$$\therefore \text{Total storage required} = 155,280 \text{ gallons}$$

$$\text{Supply for 18 hrs} = 31,620 \times 18 = 569,160 \text{ gallons}$$

$$\ast \text{ Excess Supply} = 569,160 - 155,280 = 413,880 \text{ gallons}$$

About 414,000 can be stored for use at
DIAMOND INDUSTRIAL ESTATE:

ALTERNATIVELY:

2.1 Assuming All Areas are served by supply
when flow is full.

$$\text{System demand} = 15,500 \times 30 = 465,000 \text{ gpd}$$

$$= 77,500 \text{ gph}$$

(Peak supply)

$$\text{Inflow} = 31,620 \text{ gph}$$

$$\text{Supply in flow} = \dots$$

$$\text{Outflow} = 77,500 \text{ g/hr.}$$

$$\text{Deficit per hr.} = 45,580 \text{ gallons.}$$

$$\therefore \text{for } 6 \text{ hrs of peak demand, total deficit} = 45,580 \times 6 = \underline{275,280 \text{ gallons}}$$

$$\therefore \text{This amount is supplied in } \underline{275,280 \text{ hrs}}$$

$$= 8.705 \text{ hrs.}$$

say 9 hrs.

$$\therefore \text{Excess night flow} = 31,620 \times 18 - 9 \text{ hrs}$$
$$= \underline{284,580 \text{ gallons}}$$

\therefore Amount available for DIAMOND INDUSTRIAL ESTATE = 284,580

$$\text{say } \underline{300,000 \text{ gallons}} \quad [\text{Filled in } 9 \text{ hrs}]$$

\therefore PROVIDE STORAGE ~~of~~ ~~at~~ ~~least~~
NOT EXCEEDING 300,000 Gallons.

According to the existing proposed demand 150,000 gallons tank can safely be constructed provided it fits into the 1st phase. Additional capacity of 150,000 can be constructed in future as the need arises.

NB: This considers only the capacity of distribution system. It does not take into account the intake effluent at the day period.

$$= 407 \text{ gpm} \times 586,080 \text{ gpd.}$$

$$= \underline{24,420 \text{ gphr.}}$$

$$\text{Deficit/hr} = 77,500 - 24,420 = \underline{53,080 \text{ gphr.}}$$

~~Approximate Cost Estimate of~~

PIPELINE ADJUSTMENT FOR INDUSTRIAL ESTATE

Proposed tank site is at McCarthy.

Proposed length of line = 2 1/4 mile = 11,880 ft.

Difference in elevation between tank point and proposed initial end of line = 425 ft

Assuming a residual head of 10 m = 32.8 ft.

Permissible head loss = 392.2 ft

$h_{loss} = [75 + 32.8] = 392.2 \text{ ft}$

$\frac{h_{loss}}{L} = \frac{392.2}{11,880} = 0.033$

Using a 6" phi, D.I. pipe with $k_s = 0.06$.

$Q_{full} = 40.877 \text{ l/sec}$

$V_{full} = 2.313 \text{ m/sec}$

$Q_{full} = 40.877 \text{ l/sec} = \frac{40.877 \times 3600}{4.5} \text{ g/hr} \times 6 \text{ hrs} = 196,209.6 \text{ g/day (peak flow)}$

or 32,701.6 g/hr

This figure tallies with the expected demand in the industrial area for the next 5-10 yrs.

APPROXIMATE COST ESTIMATE FOR THE
DIAMOND INDUSTRIAL ESTATE WATER
SUPPLY SYSTEM

PIPELINE :

1.0) 11,850 ft of 6" (150 mm) ϕ DI pipe @ \$35/ft
= \$ 415,800 dollars

1.1) Pipe fittings \approx 15% pipe cost --- \$ 62,370

Total pipe + fittings = \$ 478,170

STORAGE:

PROVIDE ONE storage tank of 150,000 gallons @ \$2.50/gal.
 \approx \$ 375,000

\therefore Total Cost of Pipeline + Storage tank
= 478,170 + 375,000 = \$ 853,170

overheads 10% 85,317
Contingency 20% 170,634

Grand Total = \$ 1,109,121 EC

\$ 410,785.56 U.S.

APPENDIX C

Technical Analysis of Water Supply in Diamond Area
in St. Vincent and the Grenadines

Technical Analysis of Water Supply in Diamond Area
in St. Vincent and the Grenadines

The southeast area of St. Vincent is supplied with water from the Montreal Springs. There are two systems which are served by the 350,000 gallon Montreal storage reservoir. One system served from a 4 inch line, demands about 86,000 gallons/day but lacks pressure due to the small size (down to 1-1/2 inch) of pipe. The larger system, a 6-inch line, is the one which the GOSVG proposes to extend to Diamond Hill. Both systems serve a total population of 15,300, of which 10,300 are served by house connections and the remainder by standpipe. The system also previously served the needs of four banana boxing plants; however, with the implementation of field boxing, usage by these centralized plants is somewhat reduced. Water use estimates are based upon consumptions of 10, 30 and 40 gpcd respectively for standpipes and rural and urban consumers served by house connections. The theoretical average use from the Montreal source is 454,000 gallon/day. Excerpts from the DeJong report from which this information was extracted are presented in Annex.

The NORENCO report assumed that industries established at the site would be "essentially dry" with water required only for factory workers at 20 gpcd. The study further noted that the "location, size and type of water supply facility required will depend upon local decisions which can only be derived from an area development plan"

For the interim character of the proposed USAID pipeline the demand for factory workers is estimated as follows:

Phase I as planned by CIDA will provide 22 acres of the full 62 acres envisaged for DIE with about 250,000 SF of factory space. Assuming 15 employees per 1,000 square feet of factory space (based upon Camden Park density), the estate will employ 3,750 workers who will consume an estimated 20 gpd each or 75,000 gpd. This volume should be added to the existing demand in the area served by Montreal Springs.

Recent discussions with the CW&SA revealed that the supply from the Montreal Springs provided 700,000 gpd during the rainy season and about 470,000 gpd during the dry season. However, during the 1987 drought, supply dropped to 330,000 gpd. When these available supplies are compared with the theoretical demand of 629,000 gpd (454,000 gpd area demand plus the 75,000 gpd DIE Phase I demand) there is a potential deficiency in

water supply, particularly during the dry season. It is apparent that neither the construction of storage tanks or selective distribution "shut downs" will result in assurance of a regular continuous water supply to either the area's population or the DIE. This analysis does not include additional water requirements for fire control in the industrial estate nor the increased domestic demand created by an expected influx of workers and their families.

APPENDIX D

Excerpts from UNDP De Jong Report 1982/83

Introduction

This important report contains basic data that will be needed for the next 30-50 years by water engineers and planners. It also contains recommendations on repair and extension of existing facilities.

Since the mid 1930's, rivers and a few springs have been used as a source of public water supply in mainland St. Vincent. A typical system comprises a variable sized masonry or concrete intake at a relatively high elevation, usually 850' to 1650' above sea level and in steep country. Sediment traps or filters may or may not be present; however, pipes of various sizes, age and type (cast, ductile and galvanised iron, steel, concrete, asbestos cement) convey water various distances under gravity firstly to storage reservoirs, with or without chlorination systems, and then through distribution lines to consumers. The considerable head generated in some systems requires that break pressure devices be provided but there are not enough of these, and line pressures more than double the acceptable design levels (150 psi) occur, resulting in substantial leakage and waste.

The ability of such a water system to provide a satisfactory supply depends on a considerable number of factors. However, the most important are the basic engineering criteria - capacity of intake, pipes, reservoirs and above all the dependability of the source, river or spring. To be able to design improvements, it is necessary first to know exactly what exists, preferably in the form of engineering scaled drawings. For none of the 34 existing intakes leading to systems were there any such recorded engineering data at the start of this project's activities. Therefore, walk over surveys have been systematically carried out, checking intakes, pipe line sizes etc, river flow, reservoir sizes and etc. Distances have been chained and elevations determined using an altimeter. Each system has been assessed in terms of its capability to satisfy the demand in the area it serves, and possible improvements have been summarised. Population data is taken from the most recent census,

It is strongly recommended to update this inventory of St. Vincent's water systems as improvements in the future are made; if this is not done so, the two years of effort in preparing this report will have been pointless. A summary of basic statistics of each system is given in Appendix .

W

Intakes Nos. 6,7,8,9,10System Name: Montreala. General Situation

The Montreal water supply System, established in 1960, was originally designed to feed the entire south eastern part of St. Vincent. By 1971, the intakes' capacity had already needed to be increased, following the 1966 construction of a 400,000 I. gallon storage/sedimentation tank. The system still feeds the south eastern part of St. Vincent but in a number of ways it is no longer adequate. To solve supply shortage problems in several areas over the larger part of the year, two break pressure tanks should be constructed and an existing pipe line increased in size. Further improvements can be introduced by taking some of the load off the system through connection of part of the region with the Majorca System. Groundwater exploration and development is also recommended in the Montreal intake area.

b. Intakes Design

The Montreal System has five river intakes, and one spring. Four of the river intakes were constructed during last improvements to the scheme, in 1971. These four streams were measured during 1970 and through 1971; records show that their total minimum flow declined to 0.47 cuft/sec (175 gpm) after a dry spell in 1970. During 1971 their minimum combined flow was 1.12 cuft/sec (418 gpm)

The fifth river intake is thought to have a similar flow pattern to the others and shows no sign of having flow derived from beyond the rain water catchment area. The spring intake flow was determined only once, at the end of the dry season, on 31st July 1970 at 187 gpm; the intake is now damaged and badly cracked, but a substantial flow is still coming through.

The combined flow into the system is reasonably stable over the year; vee-notch weirs installed at the intakes remain in good order, and established magnitude order of the flows in 1970-71. Except during the occasional two to four weeks/year, combined flows exceed 400 gpm (575 000 gpd).

Each system is described below; typical intake is shown at Fig. 21.

Typical Montreal Intake

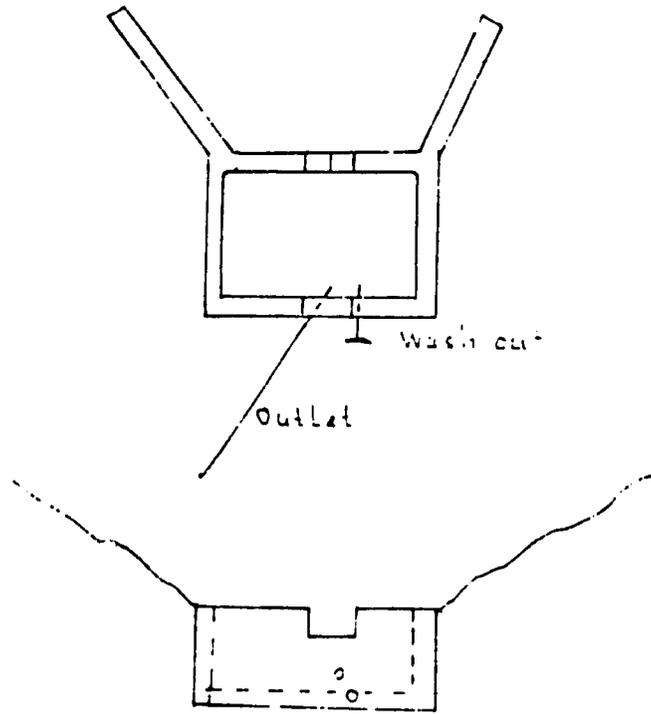


Fig. 21

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i. Old Intake - No. 5

At elevation 1510 ft, the source is connected through 300ft of 4" pipe which brings the water down to a balance chamber at elevation 1470 ft. A further 300ft of 4" pipe takes the water down to a grit chamber, at elevation 1430 ft.

ii. Spring Intake No. 6

The spring eye is at an elevation of 1468 ft; two 4" pipes convey the water down to a collection chamber at elevation 1462ft. Technically, the capacity of this system is approximately 200 gpm. Its minimum flow is now difficult to establish because the collection tank walls are leaking through several cracks. Measurements in the past when it was less damaged gave a flow of 187 gpm after a long dry spell. This is thought to be a safe minimum flow estimate, with a substantial increase during the wet season.

iii. Intake No. 7

This is at elevation 1515ft and is connected to 200ft of 3" pipe which conveys the water to a balancing chamber at elevation 1485ft., from where runs 150ft of 3" pipe to the collection chamber mentioned in (ii). Technically, the capacity of the system is approximately 100 gpm, with a minimum flow, according to 1970/1971 records of 35 gpm, during half a month after a dry spell of three months. From the collection chamber to the grit chamber runs a 6" and a 3" pipe over a length of 100ft. Technically, this part of the system has a capacity of approximately 750 gpm.

iv. Intake No. 8

This is at an elevation of 1600ft, and is connected to a 3", and lower down by a 4" pipe, to convey the water to a balancing chamber at elevation 1495ft. The length of the pipe work is approximately 800'. This balancing chamber is connected by a 6" pipe line to the Grit chamber at elevation 1465ft. Technically, the capacity of the upper part of the system is approximately 125 gpm. Its minimum capacity, according to records 1970/1971 records, is 20 gpm, after a dry spell of three months.

* Elevations quoted may not be accurate as it was measured with a barometric level recorder.

v. Intake No. 9

This is at elevation 1650ft. and is connected to a 2½" pipe conveying the water down to the balancing chamber at elevation 1495'. The length of pipe work is approximately 800ft. Technically, the capacity of this system is 100 gpm. According to the 1970/1971 records, the minimum flow is 50 gpm.

vi. Intake No. 10

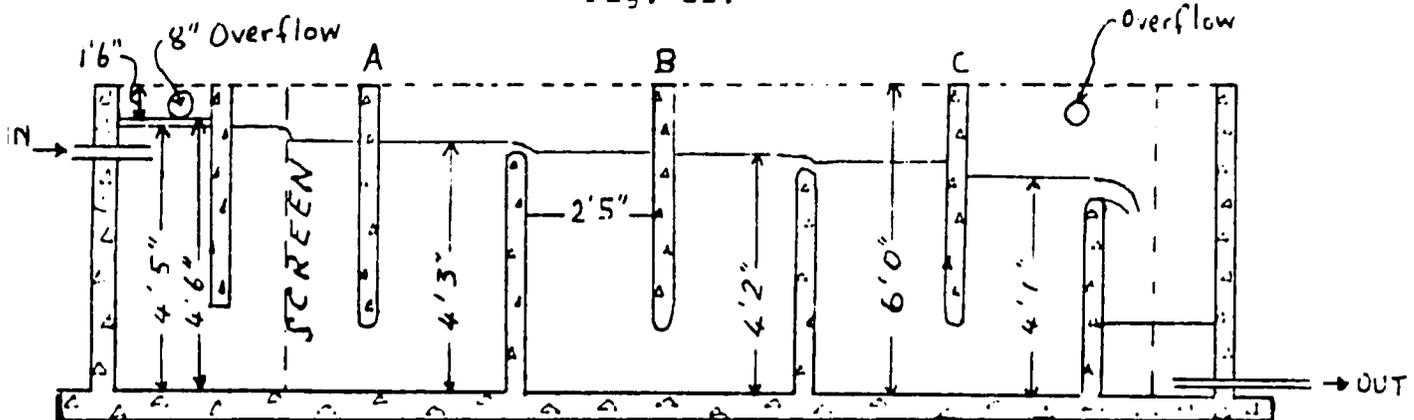
This is at elevation 1625ft and is connected by a 4" line to the balancing chamber at elevation 1495ft by approximately 1200' pipework. Technically the capacity of this system is approximately 250 gpm, and according to the 1970/1971 flow after a dry spell is 75 gpm.

Technically the capacity from the balancing chamber at elevation 1495' to the grit chamber at elevation 1465' (length of the 6" pipe is approximately 800') is 450 gpm. This could lead to an overflow situation during the wetter parts of the year, as has already been observed. The design of the grit chamber is shown in Fig. 22.

vii. Grit Chamber

The grit chamber is illustrated at Fig. 22.

Fig. 22.

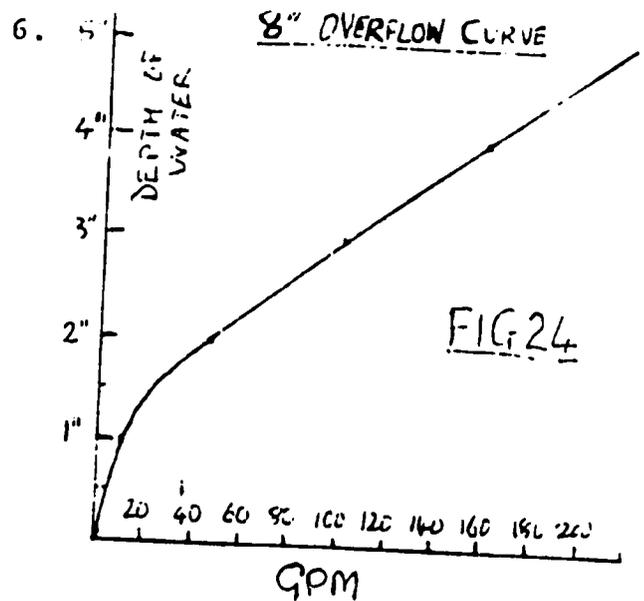
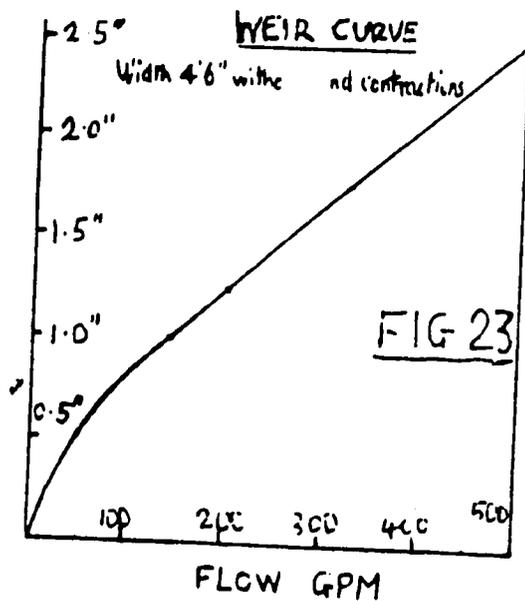
Inside Screen Dimensions

Wide 4' 6"

Height 6' 0"

Length 30'

Weirs 4' 6' wide



The weir curve (Fig. 23) gives the amount of water passing over the weir if the water in the grit chamber is a distance H above the weir. For example, if H is 1" over the last (lowest) weir, the flow is 140 gpm.

Over the three higher weirs the headloss in each case is approximately 1" giving a total loss of 3" even though they are submerged, because allowance for losses needs to be taken into account beneath wall A, B and C. The losses over the screen depend very much on the amount of solid material piled against it; it is in the same order of magnitude as the weir, after a little operation time. Thus the water level in the inlet chamber in the example quoted above is 4'5" above the floor. The inlet chamber has an 8" overflow pipe at 4'6" above the floor.

Technically, the total capacity of the grit chamber can be established; $H = 1\frac{1}{2}$ ", and the total capacity is 270 gpm before overflow begins.

viii. Overflow

When overflow occurs, the wastage can be calculated from Fig. 24 by measuring the depth of water in the 8" pipe. An overflow of 1" depth gives a wastage of 10 gpm, and the increased flow through the grit chamber will be 500 gpm. An overflow of 2" depth gives a wastage of 50 gpm and the increased flow over the weirs will be 500 gpm. An over

flow depth of 3" gives a wastage of 100 gpm; the increased flow through the grit chamber will be 600 gpm.

ix. Grit Chamber to Reservoir System

The system between the grit chamber (1465 ft) and the reservoir (at elevation 1420 ft) has a total capacity of approximately 700 gpm, compared with the 270 gpm capacity of the grit chamber. The length of combined 6" and 4" pipe is 800 ft. All the water that runs to waste from the overflow could go to the reservoir simply by partially blocking the 8" pipe to a depth of only 3".

However except at the end of the dry season the reservoir also over-flows for most of the year. It is clear, therefore that its designed capacity is much too low.

The total maximum capacity of all the intakes and springs is 900 gpm having an estimated total minimum flow of 407 gpm. The grit chamber over-flows at 270 gpm capacity; this also needs enlargement, to match the capacity of the pipework between it and the reservoir, ie 700 gpm. However, as noted, a temporary solution is obtained by partially blocking the overflow. The reservoir capacity needs to be at least doubled.

c. The Existing Distribution Systems

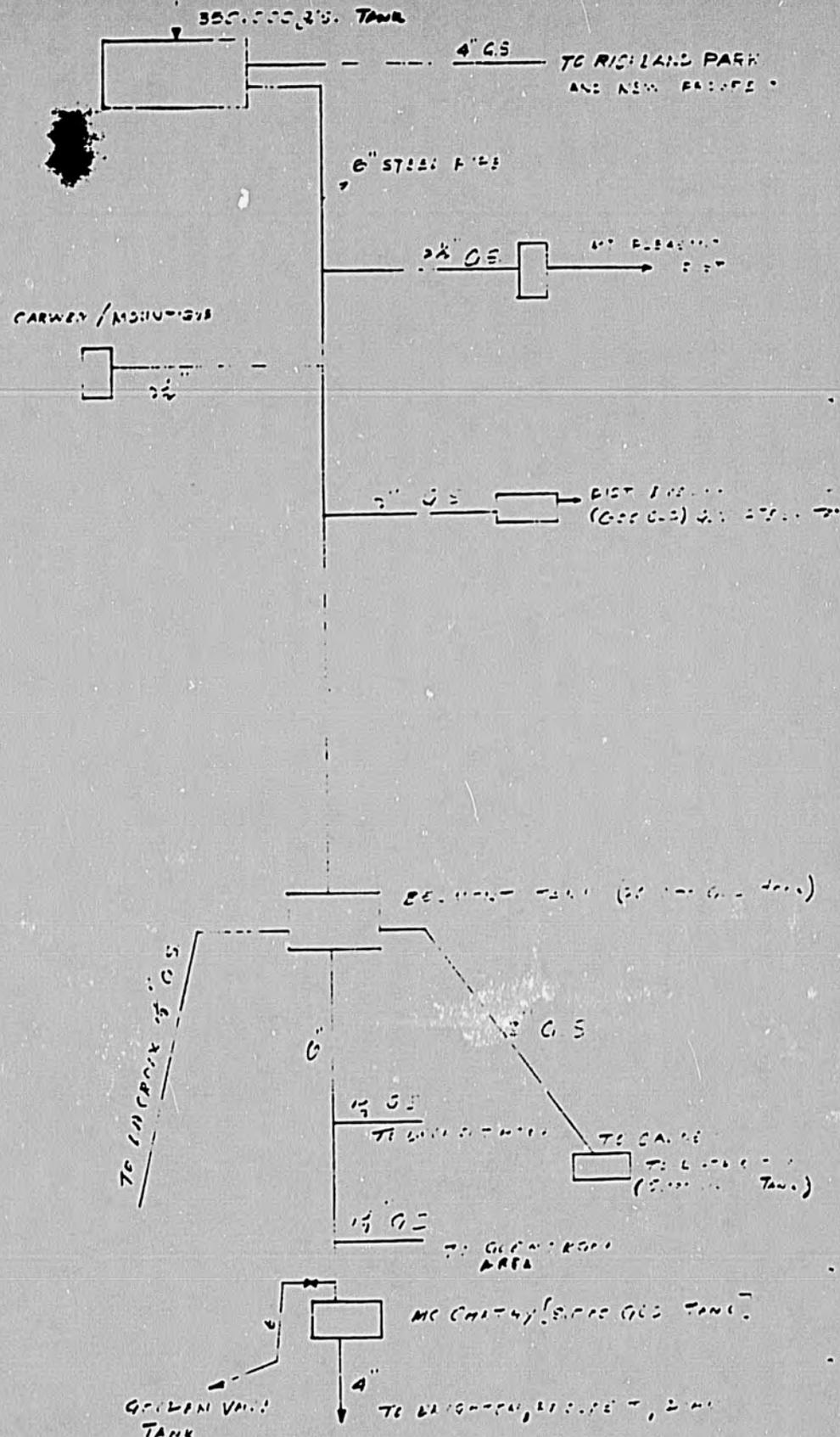
1. Systems Description

Two distinct systems distribute water from the Montreal storage reservoir; Fig. 25 illustrates diagrammatically the smaller of the two. There is a total length of 9560 ft. (4", 3", 2½" and 1½") of distribution line of which some 3000 ft totally lacks any pressure, due to the small line size and the high demand in the lower areas.

This system should feed the following areas, taking each in turn from the intake:

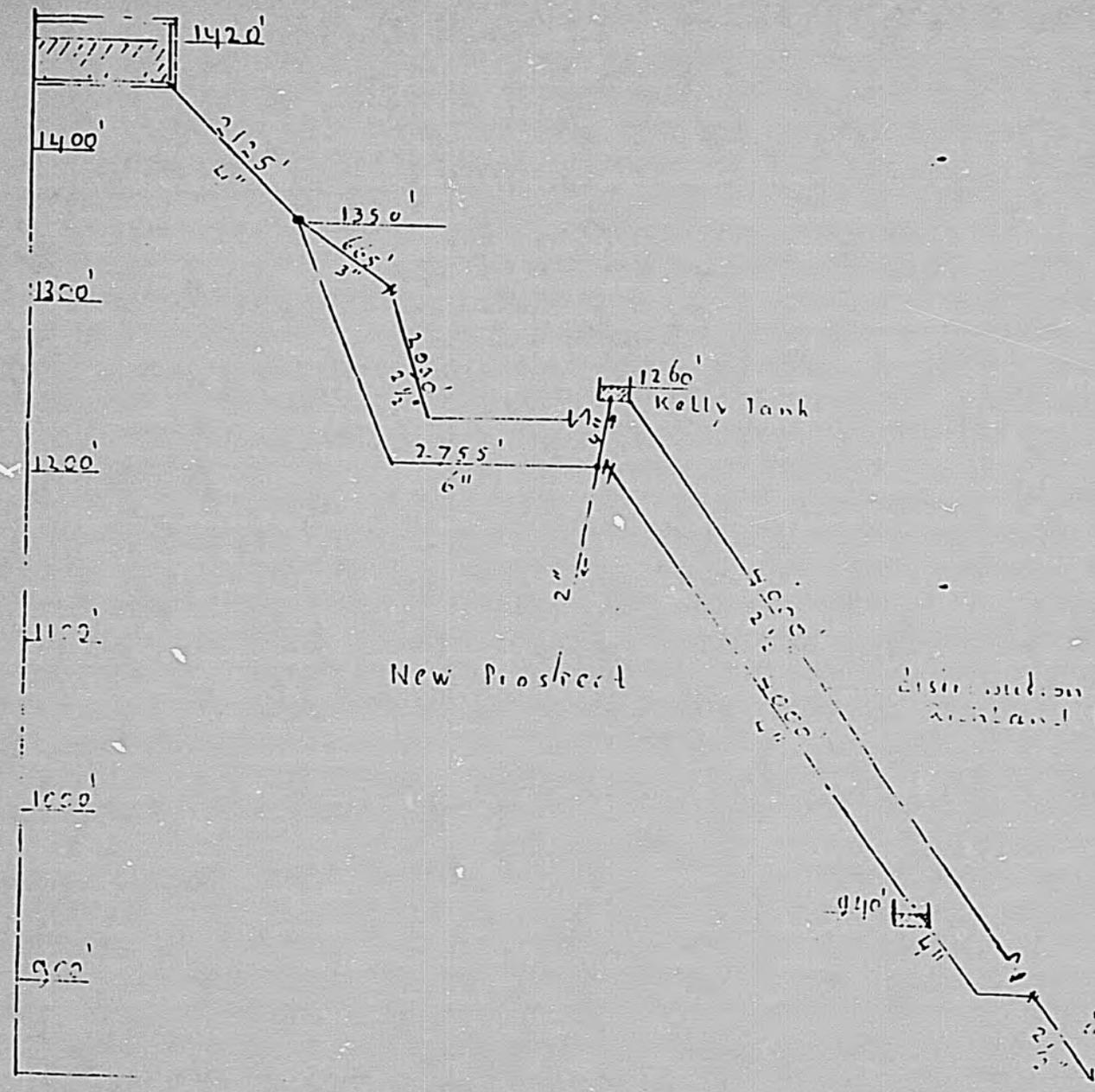
- i. Kelly Park Boxing Plant, and Montreal Corporation Boxing Plant.
- ii. Kelly break pressure tank.
- iii. 1½" line from the main to New Prospect.
- iv. 1½" line from the reservoir for distribution into Richland Park.

The larger 6" main system is shown in Fig. 26. It has a total



EXISTING 6" STEEL PIPE FROM NON-REAR:

Montreal "Smaller"
 Distribution Line
 Improved Aug. 1983



New Prostreet

1260'
 Kelly Tank

distribution
 Richland Park

distribution
 Lower
 Richland Park

Fig. 25

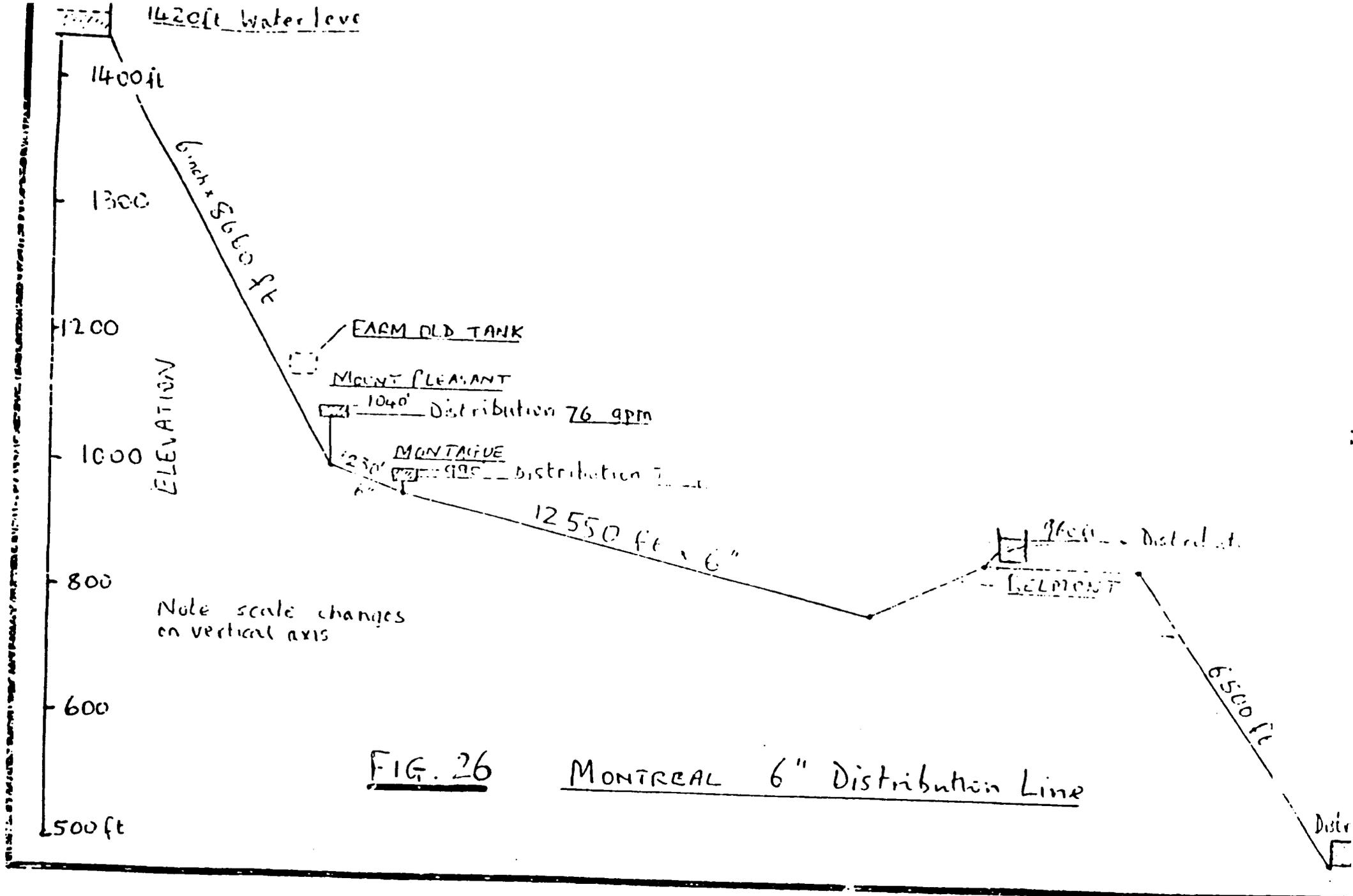


FIG. 26

MONTREAL 6" Distribution Line

7/6

- i. Mount Pleasant Tank, feeding the Mesopotamia Valley.
- ii. Montague Tank, feeding Collins Estate, Eveshan Vale and Collin's Boxing Plant.
- iii. Belmont Tank feeding La Croix Boxing Plant, AMeys, Argyle, and Stubbs.
- iv. Mc Carthy Tank, feeding east of Calliagua.

2. Water Supply and Population by Type of Connection, 1981.

Estimate of the population served in each of the areas:

| | |
|-----------------------------|---|
| Total population | 15,300 |
| Number of house/connections | approx. 2000 ie. 5 persons/connection. |
| Number of standpipes | approx. 50 ie. 100 persons/standpipe. |

The 1981 population and their sources of water supply are summarised in Table 2.

Table 2.

| Area | Population | | | Total |
|--------------------------------------|------------------------|-----------------------------|-----------|--------|
| | House Connection Rural | House Connection Semi Urban | Standpipe | |
| y Park & Montreal Corp. ng Plants | | | 200 | 200 |
| y Break sure Tank | 1,500 | | 1,300 | 2,800 |
| Pleasant | 600 | 2,000 | 500 | 3,100 |
| ague | 600 | 2,000 | 500 | 3,100 |
| nt | 2,300 | | 1,500 | 3,800 |
| rthy | 1,300 | | 1,000 | 2,300 |
| s | 6,300 | 4,000 | 5,000 | 15,300 |

3. Estimated Water Use - Entire System, 1981.

Table 3 summarises the average estimated water use for the Montreal System.

Table 3.

| Consumer | Average Use |
|-----------------------------------|----------------|
| Stand pipe | 10g/capita/day |
| Rural Consumer | 30g/capita/day |
| Semi Urban Consumer | 40g/capita/day |
| Industrial Use - All Measured. | |
| <u>Boxing Plants</u> | |
| La Croix Boxing Plant | 10 gpm |
| Collins | 4 gpm |
| Kelly Park | 8 gpm |
| Montreal Corporation | 18 gpm |

**NO LONGER
REQUIRES
THIS
QUANTITY
OF WATER
IN VIEW OF FIELD BORING PRACTICES.**

The average demand of the boxing plants have been established based on meter readings, in the knowledge that each plant operates once a week for an 8 to 10 hrs period. When they are more often in operation the amount used in gpm is thought not to be appreciably greater.

4. Summary of Total Daily Average Water Use.

The total average daily use is listed in Table 4.

Table 4.

4" System (Smaller)

| | |
|------------|-----------------------------|
| Rural | 45 000 |
| Stand Pipe | 15 000 |
| Industrial | <u>26 000</u> |
| | 86 000 gallons/day = 60 gpm |

6" System (Larger)

| | |
|------------|---------------|
| Rural | 144 000 |
| Semi Urban | 160 000 |
| Stand Pipe | 35 000 |
| Industrial | <u>29 000</u> |

368 000 gallons/day = 255 gpm

Theoretically, the total average use in the Montreal System is 454,000 galls/day which is equivalent to 315 gpm, or allowing for 20% losses, 378 gpm. This is well within the capacity of the sources, even at the time of minimum flow, estimated ³⁵407 gpm. Measurements show that actual use averages 850 000 gpd, so there is wastage of 45 - 50%

5. Technical Capacity of the Systems.

The schematics of the main systems are diagrammed at Figs 25 and 26.

Technically, to keep Belmont Tank pressurised the capacity of the 6" line is 330 gpm. Similarly, the capacity of the system to the Kelly Tank is only 45 gpm.

Noting the demands in Section c.4, these amounts of water are inadequate for the regions served, and require improvement.

6. Proposed Improvements

The improvements proposed below are in order of priority:

- i. Increase the pipe line size to the Kelly Tank to four inch size, ie. replace 2755 ft of 3", 2½" and 2" line.
- ii. Place in the Richland Park area a 5000 gallon break pressure tank and feed it by an extended four inch line from the Kelly Tank (approx. 2300 ft pipe).
- iii. Place in New Prospect a 5000 gallon break pressure tank.
- iv. Connect Mount Pleasant Tank to the adjacent Majorca System and add to the John Hill intake that was washed away in 1981. This will relieve the 6" system so that enough water can reach Belmont.
- v. If necessary, the capacity of the collection systems can be increased, but it is presently adequate. The total capacity of the

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distribution systems is about 430 gpm, which by abstracting from the Mount Pleasant Tank according to (iv), will be just about adequate to feed the maximum daily demand on a maximum day. The distribution system is therefore at the limit of its present capacity, and more studies are needed to establish how to further improve the water supply to the area.

vi. Much water/^{is}wasted in the area; metering and leak repair should help; there is a wastage of 45-50% of all water supplied

d. Areas and Population Supplied

The total population supplied by this system is about 15500. There are two main areas of supply; Richland Park and New Prospect are on one part of the system, which is now under reconstruction, and involving 4500 people. The other areas supplied are Mount Pleasant, Free-land, Montague, Carriere, Belmont, Mc Carthy, Stubbs, Brighton, Prospect, Calliqua, and Calder (total 11,000 people)

Water supply in these areas is very unevenly distributed, and several of them heavily influence each other. The total distribution area is very widespread, and in consequence improvements to the system will be costly.

Intakes Nos. 11 and 12

System Name: Camel

i. General Situation

This system depends on intakes at two small springs, both being poorly maintained. The water is collected in an 8000 gallon storage tank which is in good condition. From the tank, a 2½" line connects with the coast to feed the Peruvian Vale area.

The elevation of the tank is 580' amsl. Intake No. 11 is at an elevation of 650' amsl. Intake No. 12 is at an elevation of 750' amsl.

. Outlet and System Capacities

Fig. 27 shows the profile of the intakes and the distribution system. The pipe line from Intake No. 11 has a capacity of 10 gpm which approximates the capacity of the spring.

The pipeline from Intake No. 12 has a capacity of 20 gpm which also

| System Name | No. and Type of Intake | Intake Capacity 000s' galls/day | | System Design Capacity gpd 000's | Popul. served | Galls. Available per head per day | | Total Storage Capacity 000's galls | Storage Consumer | Treatment |
|----------------------|------------------------|---------------------------------|------------|----------------------------------|---------------|-----------------------------------|------------|------------------------------------|------------------|--|
| | | dry Season | wet Season | | | dry Season | wet Season | | | |
| | | | | | | | | | | |
| 1 Mamoon | 1 River | 40 | 200 | 260 | 2,000 | 20 | 100 | 60 | | |
| 2 Majorca | 1 River | 500 | 350 | 500 | 5,000 | 55 | 100 | 70 | 30 | None |
| 3 John Hill | 1 River | 170 | 250 | 350 | 4,000 | 55 | 87.5 | 70 | 7 | Drip feed Chlorinator |
| 4-5 Dalway | 2 River | 1,500 | 2,700 | 2,700 | 30,000 | 50 | 90 | 585 | 20 | Gas Chlorination |
| | | 100 | 300 | 300 | 4,500 | 20 | 65 | None | - | none (old system sedimentation. |
| 6-10 Montreal | 1 Spr. | 400 | 1,100 | 4"/250 | 4,500 | 25 | 55 | 670 | 36 | Drip feed Chlorination + Sedimentation |
| | 4 River | | | 6"/450 | 11,000 | 25 | 40 | | | |
| 11-12 Camel | 2 Spr. | 40 | 13 | 55 | 800 | 50 | 50 | 8 | 10 | None |
| 13-14 Greigs | 2 Spr. | 75 | 100 | 100 | 2,000 | 35 | 50 | 28 | 14 | Drip feed Chlorinator |
| 15-16 Lauders | 2 Spr. | 80 | 50 | 35 | 5,000 | 7 | 7 | 12 | 2 | Drip feed Chlorinator |
| 17-18 Higher Lowmans | 1 River | 100 | 100 | 100 | 2,200 | 45 | 45 | 18 | 8 | Drip feed Chlorinator + Sand filter |
| 19 Lively | 1 Spr. | 20 | 30 | 30 | 1,500 | 20 | 20 | 8 | 5 | Sand filter Drip feed Chlorinator |
| 20-21 South Rivers | 2 Spr. | 180 | 220 | 90 | 6,000 | 20 | 20 | 51 | 8,5 | Drip feed Chlorinator |
| 22 Byera | 1 Spr. | 15 | 15 | 15 | 2,500 | 6 | 6 | 10 | 4 | Drip feed Chlor. |
| 23-26 Georgetown | 3 Spr. | 95 | 95 | 200 | 6,500 | 15 | 15 | 25,8 | 14 | Drip feed chlor. |
| 27 Sandy Bay | 1 river | 90 | 90 | 90 | 2,000 | 45 | 45 | 80 | 40 | None |
| 28 Owia | 1 river | 50 | 50 | 50 | 900 | 55 | 55 | - | - | facilities (None) |
| 29 Fancy | 1 river | 50 | 50 | 50 | 400 | 125 | 125 | 0,8 | 2 | Poor filter |
| 30-32 Chateau Belair | 1 river | 80 | 120 | 120 | 3,500 | 35 | 20 | 25 | 7 | Sand filter, poor |
| | 2 spr. | | | | | | | | | |
| 33 Spr. Village | 1 spr. | 28 | 25 | 24 | 900 | 26 | 26 | 12 | 13 | None |

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| <u>System Name</u> | <u>No. and Type of Intake</u> | <u>Intake Capacity</u> | | <u>System Design Capacity</u> gpd 000's | <u>Popu. served</u> | <u>Galls Available per head per day</u> | | <u>Total Storage</u> <u>Capa.</u> 000's galls | <u>Storage Consumer</u> | <u>Treatment</u> |
|---------------------|-------------------------------|------------------------|-------------------|--|---------------------|---|-------------------|---|-------------------------|----------------------------|
| | | <u>dry Season</u> | <u>wet Season</u> | | | <u>dry Season</u> | <u>wet Season</u> | | | |
| 34 Cumberland River | 1 River | 1 000 | 1 680 | 600 800 | 4,200 4,000 | 100 | 150 200 | Poor | | Sedimentation no Chlor. |
| 35 Lenoir | 1 spr. | 100 | 100 | 300 | 3,500 | 30 | 50 | 45 | 1- | Drip feed chlor. |
| <u>Grand Total</u> | | 18 rivers | 4,600 | 8,171 | 7,792 | 106,900 | | 1,616.9 | | |
| | | 16 Springs | | | | | | | | |

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APPENDIX E

GOSVG Letter of Request



Mr James S Holtaway
Director
USAID REGIONAL DEVELOPMENT OFFICE/CARIBBEAN
P O Box 302
Bridgetown
BARBADOS

DEVELOPMENT,
KINGSTOWN,
ST. VINCENT AND THE GRENADINES.

..... 27 April 1989

686114W60

Dear Mr Holtaway,

Subject: ST VINCENT INFRASTRUCTURE, DIAMOND INDUSTRIAL ESTATE WATER SUPPLY

Thank you for your letter of April 20, 1989 and for advising us that USAID has completed documentation required to permit approval of funds for the interim water supply system for the Diamond Industrial Estate (DIE). As requested, the following information is provided which coincides alphabetically with your queries:

a CIDA appointed Nordex Consultants Ltd for the preparation of a feasibility study for meeting the long-term water supply requirements of the DIE and the south-east area of St Vincent. Nordex Consultants submitted their report in February 1988 and suggested eight options. Government accepted Colonarie River/Union River as the best alternative and requested CIDA to arrange for the preparation of the detailed feasibility study.

Mr John M Robinson, Vice President of CIDA, Americas Branch, in his letter dated September 29, 1988 addressed to the Hon Prime Minister gave the assurance that CIDA was prepared to consider a long term and substantial involvement in the water sector which could involve more immediately the Colonarie River/Union River water supply scheme and in a second, later stage the development of a groundwater programme.

Following further consideration of the Nordex Consultants' report, the Government and CIDA agreed that the exploration and development of groundwater should be undertaken first because this option was ranked higher and was capable of providing an adequate permanent water supply for the DIE at a substantially lower cost. It is our understanding that CIDA is currently in the process of preparing a project identification memorandum which will define the scope of the project for meeting the long-term needs of the DIE and this is expected to be approved in the next one or two months.

CIDA does not require any formal agreement with the Government for carrying out exploration of groundwater resources as this is considered a prefeasibility exercise. However, CIDA has advised us that the exploration work is expected to commence in the next two or three months and be completed in one year. Until the proposed exploration tests indicate that groundwater is a viable option, it is not possible for CIDA to give any firm date for the development of groundwater sources.

| |
|--------|
| ACTION |
| DIR |
| D/DIR |
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| RLA |
| RCO |
| RKI |
| POD |
| INC |
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| SIGN? |
| NO: |

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Page 2

Mr James S Holtaway

27 April 1989

- c Final agreement was reached in December 1988 between the Government and CIDA on all the elements which will be included in the infrastructure project for phase one of the DIE. The Terms of Reference for the Consultant to provide consultancy services for the infrastructure project were finalized in February 1989. CIDA has advised us that a list of consultants has been prepared and is now with the Minister for approval of a shortlist. CIDA is expected to invite proposals from shortlisted consultants by the end of June 1989. It is expected that the preparation of an inception report, detailed designs and tender documents will commence in January 1990 and be completed in June 1990. Construction is expected to commence in January 1991 and be completed in July 1992.
- d CDB has programmed US \$3 million to finance the construction of factory shells at the DIE. The construction of factory shells will commence after the completion of infrastructure project by CIDA.
- e The local representative of Island Bakeries Limited has informed me that arrangements are progressing satisfactorily towards commencement of construction of the biscuit factory in late June 1989 and completion of the works by the end of 1990.

Government wishes to confirm that CIDA is committed to the implementation of a scheme which would provide a safe and reliable water supply system for meeting the medium and long-term requirements of the DIE because it is critical to protecting CIDA's proposed substantial and long-term investment in the development of the DIE.

In view of the above, the Government of St Vincent and the Grenadines now formally reiterates its request for USAID to expedite the implementation of the interim water supply system for the DIE.

Best regards.

Yours sincerely,



K E V John
Director of Planning

KEVJ:bm



APPENDIX F

Statutory Checklist

5C(1) - COUNTRY CHECKLIST

Listed below are statutory criteria applicable to: (A) FAA funds generally; (B)(1) Development Assistance funds only; or (B)(2) the Economic Support Fund only.

A. GENERAL CRITERIA FOR COUNTRY ELIGIBILITY

1. FY 1989 Appropriations Act Sec. 578(b). No.
Has the President certified to the Congress that the government of the recipient country is failing to take adequate measures to prevent narcotic drugs or other controlled substances which are cultivated, produced or processed illicitly, in whole or in part, in such country or transported through such country, from being sold illegally within the jurisdiction of such country to United States Government personnel or their dependents or from entering the United States unlawfully?

2. FAA Sec. 481(h); FY 1989 Appropriations Act Sec. 576; 1986 Drug Act Secs. 4405-07. No.
(These provisions apply to assistance of any kind provided by grant, sale, loan, lease, credit, guaranty, or insurance, except assistance from the Child Survival Fund or relating to international narcotics control, disaster and refugee relief, narcotics education and awareness, or the provision of food or medicine.) If the recipient is a "major illicit drug producing country" (defined as a country producing during a fiscal year at least five metric tons of opium or 500 metric tons of coca or marijuana) or a "major drug-transit country" (defined as a country that is a significant direct source of illicit drugs significantly affecting the United States, through which such drugs are transported, or through which significant sums of drug-related profits are

laundered with the knowledge or complicity of the government): (a) Does the country have in place a bilateral narcotics agreement with the United States, or a multilateral narcotics agreement? and (b) Has the President in the March 1 International Narcotics Control Strategy Report (INSCR) determined and certified to the Congress (without Congressional enactment, within 45 days of continuous session, of a resolution disapproving such a certification), or has the President determined and certified to the Congress on any other date (with enactment by Congress of a resolution approving such certification), that (1) during the previous year the country has cooperated fully with the United States or taken adequate steps on its own to satisfy the goals agreed to in a bilateral narcotics agreement with the United States or in a multilateral agreement, to prevent illicit drugs produced or processed in or transported through such country from being transported into the United States, to prevent and punish drug profit laundering in the country, and to prevent and punish bribery and other forms of public corruption which facilitate production or shipment of illicit drugs or discourage prosecution of such acts, or that (2) the vital national interests of the United States require the provision of such assistance?

3. 1986 Drug Act Sec. 2013; 1988 Drug Act Sec. 4404. (This section applies to the same categories of assistance subject to the restrictions in FAA Sec. 481(h), above.) If recipient country is a "major illicit drug producing country" or "major drug-transit country" (as defined for the purpose of FAA Sec 481(h)), has the President submitted a report to Congress listing such country as one (a) which, as a matter of government policy, encourages or facilitates the production or distribution of illicit drugs; (b) in which any senior official of the

No.

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government engages in, encourages, or facilitates the production or distribution of illegal drugs; (c) in which any member of a U.S. Government agency has suffered or been threatened with violence inflicted by or with the complicity of any government officer; or (d) which fails to provide reasonable cooperation to lawful activities of U.S. drug enforcement agents, unless the President has provided the required certification to Congress pertaining to U.S. national interests and the drug control and criminal prosecution efforts of that country?

4. FAA Sec. 620(c). If assistance is to a government, is the government indebted to any U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies, (b) the debt is not denied or contested by such government, or (c) the indebtedness arises under an unconditional guaranty of payment given by such government or controlled entity? No.
5. FAA Sec. 620(e)(1). If assistance is to a government, has it (including any government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities? No.
6. FAA Secs. 620(a), 620(f), 620D; FY 1989 Appropriations Act Secs. 512, 550, 592. Is recipient country a Communist country? If so, has the President determined that assistance to the country is vital to the security of the United States, that the recipient country is not controlled by the international Communist conspiracy, and that such assistance will further promote the independence of the recipient country from international communism? Will assistance be provided No.

either directly or indirectly to Angola, Cambodia, Cuba, Iraq, Libya, Vietnam, South Yemen, Iran or Syria? Will assistance be provided to Afghanistan without a certification, or will assistance be provided inside Afghanistan through the Soviet-controlled government of Afghanistan?

7. FAA Sec. 620(j). Has the country permitted, or failed to take adequate measures to prevent, damage or destruction by mob action of U.S. property? No.
8. FAA Sec. 620(l). Has the country failed to enter into an investment guaranty agreement with OPIC? No.
9. FAA Sec. 620(o); Fishermen's Protective Act of 1967 (as amended) Sec. 5. (a) Has the country seized, or imposed any penalty or sanction against, any U.S. fishing vessel because of fishing activities in international waters? (b) If so, has any deduction required by the Fishermen's Protective Act been made? (a) No.
(b) No.
10. FAA Sec. 620(q); FY 1989 Appropriations Act Sec. 516. (a) Has the government of the recipient country been in default for more than six months on interest or principal of any loan to the country under the FAA? (b) Has the country been in default for more than one year on interest or principal on any U.S. loan under a program for which the FY 1989 Appropriations Act appropriates funds? (a) No.
(b) No.
11. FAA Sec. 620(s). If contemplated assistance is development loan or to come from Economic Support Fund, has the Administrator taken into account the percentage of the country's budget and amount of the country's foreign exchange or other resources spent on military equipment? (Reference may be made to the annual "Taking Into Consideration" memo: "Yes, taken into account by the Administrator at time of approval of Yes, taken into account by the Administrator at time of approval of Agency OYB.

Agency OYB." This approval by the Administrator of the Operational Year Budget can be the basis for an affirmative answer during the fiscal year unless significant changes in circumstances occur.)

12. FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have relations been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption? No.
13. FAA Sec. 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the A.I.D. Administrator in determining the current A.I.D. Operational Year Budget? (Reference may be made to the "Taking into Consideration" memo.) St. Vincent is currently in arrears to U.N. agencies. Yes, taken into account by Administrator at time of approval of Agency OYB.
14. FAA Sec. 620A. Has the President determined that the recipient country grants sanctuary from prosecution to any individual or group which has committed an act of international terrorism or otherwise supports international terrorism? No.
15. FY 1989 Appropriations Act Sec. 568. Has the country been placed on the list provided for in Section 6(j) of the Export Administration Act of 1979 (currently Libya, Iran, South Yemen, Syria, Cuba, or North Korea)? No.
16. ISDCA of 1985 Sec. 552(b). Has the Secretary of State determined that the country is a high terrorist threat country after the Secretary of Transportation has determined, pursuant to section 1115(e)(2) of the Federal Aviation Act of 1958, that an airport in the country does not maintain and administer effective security measures? No.

17. FAA Sec. 666(b). Does the country object, on the basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. who is present in such country to carry out economic development programs under the FAA? No.
18. FAA Secs. 669, 670. Has the country, after August 3, 1977, delivered to any other country or received nuclear enrichment or reprocessing equipment, materials, or technology, without specified arrangements or safeguards, and without special certification by the President? Has it transferred a nuclear explosive device to a non-nuclear weapon state, or if such a state, either received or detonated a nuclear explosive device? (FAA Sec. 620E permits a special waiver of Sec. 669 for Pakistan.) No.
19. FAA Sec. 670. If the country is a non-nuclear weapon state, has it, on or after August 8, 1985, exported (or attempted to export) illegally from the United States any material, equipment, or technology which would contribute significantly to the ability of a country to manufacture a nuclear explosive device? No.
20. ISDCA of 1981 Sec. 720. Was the country represented at the Meeting of Ministers of Foreign Affairs and Heads of Delegations of the Non-Aligned Countries to the 36th General Assembly of the U.N. on Sept. 25 and 28, 1981, and did it fail to disassociate itself from the communique issued? If so, has the President taken it into account? (Reference may be made to the "Taking into Consideration" memo.) No.
21. FY 1989 Appropriations Act Sec. 527. Has the recipient country been determined by the President to have engaged in a consistent pattern of opposition to the foreign policy of the United States? No.

22. FY 1989 Appropriations Act Sec. 513. Has the duly elected Head of Government of the country been deposed by military coup or decree? If assistance has been terminated, has the President notified Congress that a democratically elected government has taken office prior to the resumption of assistance? No.
23. FY 1989 Appropriations Act Sec. 540. Does the recipient country fully cooperate with the international refugee assistance organizations, the United States, and other governments in facilitating lasting solutions to refugee situations, including resettlement without respect to race, sex, religion, or national origin? Yes.

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B. FUNDING SOURCE CRITERIA FOR COUNTRY ELIGIBILITY

1. Development Assistance Country Criteria

FAA Sec. 116. Has the Department of State determined that this government has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, can it be demonstrated that contemplated assistance will directly benefit the needy?

N/A

FY 1989 Appropriations Act Sec. 536. Has the President certified that use of DA funds by this country would violate any of the prohibitions against use of funds to pay for the performance of abortions as a method of family planning, to motivate or coerce any person to practice abortions, to pay for the performance of involuntary sterilization as a method of family planning, to coerce or provide any financial incentive to any person to undergo sterilizations, to pay for any biomedical research which relates, in whole or in part, to methods of, or the performance of, abortions or involuntary sterilization as a means of family planning?

N/A

2. Economic Support Fund Country Criteria

FAA Sec. 502B. Has it been determined that the country has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, has the President found that the country made such significant improvement in its human rights record that furnishing such assistance is in the U.S. national interest?

No.

FY 1989 Appropriations Act Sec. 578(d). Has this country met its drug eradication targets or otherwise taken significant steps to halt illicit drug production or trafficking?

Yes.

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5C(2) - PROJECT CHECKLIST

Listed below are statutory criteria applicable to projects. This section is divided into two parts. Part A includes criteria applicable to all projects. Part B applies to projects funded from specific sources only: B(1) applies to all projects funded with Development Assistance; B(2) applies to projects funded with Development Assistance loans; and B(3) applies to projects funded from ESF.

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

A. GENERAL CRITERIA FOR PROJECT

1. FY 1989 Appropriations Act Sec. 523; FAA Sec. 634A. If money is sought to obligated for an activity not previously justified to Congress, or for an amount in excess of amount previously justified to Congress, has Congress been properly notified? N/A
2. FAA Sec. 611(a)(1). Prior to an obligation in excess of \$500,000, will there be (a) engineering, financial or other plans necessary to carry out the assistance, and (b) a reasonably firm estimate of the cost to the U.S. of the assistance? (a) Yes.
(b) Yes.
3. FAA Sec. 611(a)(2). If legislative action is required within recipient country, what is the basis for a reasonable expectation that such action will be completed in time to permit orderly accomplishment of the purpose of the assistance? No further legislative action is required.

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4. FAA Sec. 611(b); FY 1989 Appropriations Act Sec. 501. If project is for water or water-related land resource construction, have benefits and costs been computed to the extent practicable in accordance with the principles, standards, and procedures established pursuant to the Water Resources Planning Act (42 U.S.C. 1962, et seq.)? (See A.I.D. Handbook 3 for guidelines.) Yes
5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and total U.S. assistance for it will exceed \$1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability to maintain and utilize the project effectively? N/A
6. FAA Sec. 209. Is project susceptible to execution as part of regional or multilateral project? If so, why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. This is a subproject to a regional project.
7. FAA Sec. 601(a). Information and conclusions on whether projects will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions. This subproject provides infrastructure for foreign and local investment by private sector enterprises. It will have a positive effect on (a) intl trade (b) private initiative and competition and (c) improve efficiency in the productive sector.
8. FAA Sec. 601(b). Information and conclusions on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise). This subproject will indirectly encourage U.S. private trade and investment.

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9. FAA Secs. 612(b), 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars.
- The GOSV funds are very limited, however "in kind" contributions will be forthcoming from the GOSV.
10. FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release?
- USG does not own excess foreign currency of St. Vincent.
11. FY 1989 Appropriations Act Sec. 521. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity?
- Assistance is not being provided for the production of any specific commodity for export.
12. FY 1989 Appropriations Act Sec. 549. Will the assistance (except for programs in Caribbean Basin Initiative countries under U.S. Tariff Schedule "Section 807," which allows reduced tariffs on articles assembled abroad from U.S.-made components) be used directly to procure feasibility studies, prefeasibility studies, or project profiles of potential investment in, or to assist the establishment of facilities specifically designed for, the manufacture for export to the United States or to third country markets in direct competition with U.S. exports, of textiles, apparel, footwear, handbags, flat goods (such as wallets or coin purses worn on the person), work gloves or leather wearing apparel?
- No.
13. FAA Sec. 119(g)(4)-(6) & (10). Will the assistance (a) support training and education efforts which improve the capacity of recipient countries to prevent loss of biological diversity; (b) be provided under a long-term agreement in which the recipient country agrees to protect ecosystems or other
- N/A

wildlife habitats; (c) support efforts to identify and survey ecosystems in recipient countries worthy of protection; or (d) by any direct or indirect means significantly degrade national parks or similar protected areas or introduce exotic plants or animals into such areas?

14. FAA Sec. 121(d). If a Sahel project, has a determination been made that the host government has an adequate system for accounting for and controlling receipt and expenditure of project funds (either dollars or local currency generated therefrom)? N/A
15. FY 1989 Appropriations Act. If assistance is to be made to a United States PVO (other than a cooperative development organization), does it obtain at least 20 percent of its total annual funding for international activities from sources other than the United States Government? N/A
16. FY 1989 Appropriations Act Sec. 538. If assistance is being made available to a PVO, has that organization provided upon timely request any document, file, or record necessary to the auditing requirements of A.I.D., and is the PVO registered with A.I.D.? N/A
17. FY 1989 Appropriations Act Sec. 514. If funds are being obligated under an appropriation account to which they were not appropriated, has prior approval of the Appropriations Committees of Congress been obtained? N/A
18. State Authorization Sec. 139 (as interpreted by conference report). Has confirmation of the date of signing of the project agreement, including the amount involved, been cabled to State L/T and A.I.D. LEG within 60 days of the agreement's entry into force with respect to the United States, and has the full text of the agreement been pouched to those same offices? (See Handbook 3, Appendix 6G for agreements covered by this provision) Will be.

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B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FY 1989 Appropriations Act Sec. 548
(as interpreted by conference report for original enactment). If assistance is for agricultural development activities (specifically, any testing or breeding feasibility study, variety improvement or introduction, consultancy, publication, conference, or training), are such activities (a) specifically and principally designed to increase agricultural exports by the host country to a country other than the United States, where the export would lead to direct competition in that third country with exports of a similar commodity grown or produced in the United States, and can the activities reasonably be expected to cause substantial injury to U.S. exporters of a similar agricultural commodity; or (b) in support of research that is intended primarily to benefit U.S. producers?

N/A

b. FAA Secs. 102(b), 111, 113, 281(a).
Describe extent to which activity will (a) effectively involve the poor in development by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, dispersing investment from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward a better life, and otherwise encourage democratic private and local governmental

N/A

institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries.

- c. FAA Secs. 103, 103A, 104, 105, 106, 120-21; FY 1989 Appropriations Act (Development Fund for Africa). Does the project fit the criteria for the source of funds (functional account) being used? N/A

- d. FAA Sec. 107. Is emphasis placed on use of appropriate technology (relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor)? N/A

- e. FAA Secs. 110, 124(d). Will the recipient country provide at least 25 percent of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or is the latter cost-sharing requirement being waived for a "relatively least developed" country)? N/A

- f. FAA Sec. 128(b). If the activity attempts to increase the institutional capabilities of private organizations or the government of the country, or if it attempts to stimulate scientific and technological research, has it been designed and will it be monitored to ensure that the ultimate beneficiaries are the poor majority? N/A

- g. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in governmental processes essential to self-government. N/A
- h. FY 1989 Appropriations Act Sec. 536. Are any of the funds to be used for the performance of abortions as a method of family planning or to motivate or coerce any person to practice abortions? N/A
- Are any of the funds to be used to pay for the performance of involuntary sterilization as a method of family planning or to coerce or provide any financial incentive to any person to undergo sterilizations?
- Are any of the funds to be used to pay for any biomedical research which relates, in whole or in part, to methods of, or the performance of, abortions or involuntary sterilization as a means of family planning?
- i. FY 1989 Appropriations Act. Is the assistance being made available to any organization or program which has been determined to support or participate in the management of a program of coercive abortion or involuntary sterilization? N/A
- If assistance is from the population functional account, are any of the funds to be made available to voluntary family planning projects which do not offer, either directly or through referral to or information about access to, a broad range of family planning methods and services?

- j. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise? N/A
- k. FY 1989 Appropriations Act. What portion of the funds will be available only for activities of economically and socially disadvantaged enterprises, historically black colleges and universities, colleges and universities having a student body in which more than 40 percent of the students are Hispanic Americans, and private and voluntary organizations which are controlled by individuals who are black Americans, Hispanic Americans, or Native Americans, or who are economically or socially disadvantaged (including women)? N/A
- l. FAA Sec. 118(c). Does the assistance comply with the environmental procedures set forth in A.I.D. Regulation 16? Does the assistance place a high priority on conservation and sustainable management of tropical forests? Specifically, does the assistance, to the fullest extent feasible: (a) stress the importance of conserving and sustainably managing forest resources; (b) support activities which offer employment and income alternatives to those who otherwise would cause destruction and loss of forests, and help countries identify and implement alternatives to colonizing forested areas; (c) support training programs, educational efforts, and the establishment or strengthening of institutions to improve forest management; (d) help end destructive slash-and-burn agriculture by supporting stable and productive farming practices; (e) help conserve forests which have not yet been degraded by helping to increase N/A

production on lands already cleared or degraded; (f) conserve forested watersheds and rehabilitate those which have been deforested; (g) support training, research, and other actions which lead to sustainable and more environmentally sound practices for timber harvesting, removal, and processing; (h) support research to expand knowledge of tropical forests and identify alternatives which will prevent forest destruction, loss, or degradation; (i) conserve biological diversity in forest areas by supporting efforts to identify, establish, and maintain a representative network of protected tropical forest ecosystems on a worldwide basis, by making the establishment of protected areas a condition of support for activities involving forest clearance or degradation, and by helping to identify tropical forest ecosystems and species in need of protection and establish and maintain appropriate protected areas; (j) seek to increase the awareness of U.S. government agencies and other donors of the immediate and long-term value of tropical forests; and (k) utilize the resources and abilities of all relevant U.S. government agencies?

- m. FAA Sec. 118(c)(13). If the assistance will support a program or project significantly affecting tropical forests (including projects involving the planting of exotic plant species), will the program or project (a) be based upon careful analysis of the alternatives available to achieve the best sustainable use of the land, and (b) take full account of the environmental impacts of the proposed activities on biological diversity?

N/A

- n. FAA Sec. 118(c)(14). Will assistance be used for (a) the procurement or use of logging equipment, unless an environmental assessment indicates that all timber harvesting operations involved will be conducted in an environmentally sound manner and that the proposed activity will produce positive economic benefits and sustainable forest management systems; or (b) actions which will significantly degrade national parks or similar protected areas which contain tropical forests, or introduce exotic plants or animals into such areas? N/A
- o. FAA Sec. 118(c)(15). Will assistance be used for (a) activities which would result in the conversion of forest lands to the rearing of livestock; (b) the construction, upgrading, or maintenance of roads (including temporary haul roads for logging or other extractive industries) which pass through relatively undegraded forest lands; (c) the colonization of forest lands; or (d) the construction of dams or other water control structures which flood relatively undegraded forest lands, unless with respect to each such activity an environmental assessment indicates that the activity will contribute significantly and directly to improving the livelihood of the rural poor and will be conducted in an environmentally sound manner which supports sustainable development? N/A
- p. FY 1989 Appropriations Act. If assistance will come from the Sub-Saharan Africa DA account, is it (a) to be used to help the poor majority in Sub-Saharan Africa through a process of long-term development and economic growth that is equitable, participatory, environmentally sustainable, and self-reliant; (b) being provided in accordance with the policies contained in section 102 of the FAA; N/A

(c) being provided, when consistent with the objectives of such assistance, through African, United States and other PVOs that have demonstrated effectiveness in the promotion of local grassroots activities on behalf of long-term development in Sub-Saharan Africa; (d) being used to help overcome shorter-term constraints to long-term development, to promote reform of sectoral economic policies, to support the critical sector priorities of agricultural production and natural resources, health, voluntary family planning services, education, and income generating opportunities, to bring about appropriate sectoral restructuring of the Sub-Saharan African economies, to support reform in public administration and finances and to establish a favorable environment for individual enterprise and self-sustaining development, and to take into account, in assisted policy reforms, the need to protect vulnerable groups; (e) being used to increase agricultural production in ways that protect and restore the natural resource base, especially food production, to maintain and improve basic transportation and communication networks, to maintain and restore the renewable natural resource base in ways that increase agricultural production, to improve health conditions with special emphasis on meeting the health needs of mothers and children, including the establishment of self-sustaining primary health care systems that give priority to preventive care, to provide increased access to voluntary family planning services, to improve basic literacy and mathematics especially to those outside the formal educational system and to improve primary education, and to develop income-generating opportunities for the unemployed and underemployed in urban and rural areas?

9. FY 1989 Appropriations Act Sec. 515. N/A
If deob/reob authority is sought to be exercised in the provision of DA assistance, are the funds being obligated for the same general purpose, and for countries within the same general region as originally obligated, and have the Appropriations Committees of both Houses of Congress been properly notified?

2. Development Assistance Project Criteria
(Loans Only)

- a. FAA Sec. 122(b). Information and N/A
conclusion on capacity of the country to repay the loan at a reasonable rate of interest.
- b. FAA Sec. 620(d). If assistance is N/A
for any productive enterprise which will compete with U.S. enterprises, is there an agreement by the recipient country to prevent export to the U.S. of more than 20 percent of the enterprise's annual production during the life of the loan, or has the requirement to enter into such an agreement been waived by the President because of a national security interest?
- c. FAA Sec. 122(b). Does the activity N/A
give reasonable promise of assisting long-range plans and programs designed to develop economic resources and increase productive capacities?

3. Economic Support Fund Project Criteria

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|---|--------------|
| a. <u>FAA Sec. 531(a)</u> . Will this assistance promote economic and political stability? To the maximum extent feasible, is this assistance consistent with the policy directions, purposes, and programs of Part I of the FAA? | Yes. Yes. |
| b. <u>FAA Sec. 531(e)</u> . Will this assistance be used for military or paramilitary purposes? | No. |
| c. <u>FAA Sec. 609</u> . If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made? | N/A |

5C(3) - STANDARD ITEM CHECKLIST

Listed below are the statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the agreement by imposing limits on certain uses of funds.

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

A. PROCUREMENT

1. FAA Sec. 602(a). Are there arrangements to permit U.S. small business to participate equitably in the furnishing of commodities and services financed? Yes.
2. FAA Sec. 604(a). Will all procurement be from the U.S. except as otherwise determined by the President or determined under delegation from him? Yes.
3. FAA Sec. 604(d). If the cooperating country discriminates against marine insurance companies authorized to do business in the U.S., will commodities be insured in the United States against marine risk with such a company? No.
4. FAA Sec. 604(e); ISDCA of 1980 Sec. 705(a). If non-U.S. procurement of agricultural commodity or product thereof is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? (Exception where commodity financed could not reasonably be procured in U.S.) N/A

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5. FAA Sec. 604(g). Will construction or engineering services be procured from firms of advanced developing countries which are otherwise eligible under Code 941 and which have attained a competitive capability in international markets in one of these areas? (Exception for those countries which receive direct economic assistance under the FAA and permit United States firms to compete for construction or engineering services financed from assistance programs of these countries.) No.
6. FAA Sec. 603. Is the shipping excluded from compliance with the requirement in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 percent of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S. flag commercial vessels to the extent such vessels are available at fair and reasonable rates? No.
7. FAA Sec. 621(a). If technical assistance is financed, will such assistance be furnished by private enterprise on a contract basis to the fullest extent practicable? Will the facilities and resources of other Federal agencies be utilized, when they are particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs? N/A
8. International Air Transportation Fair Competitive Practices Act, 1974. If air transportation of persons or property is financed on grant basis, will U.S. carriers be used to the extent such service is available? N/A
9. FY 1989 Appropriations Act Sec. 504. If the U.S. Government is a party to a contract for procurement, does the contract contain a provision authorizing termination of such contract for the convenience of the United States? N/A

10. FY 1989 Appropriations Act Sec. 524. If assistance is for consulting service through procurement contract pursuant to 5 U.S.C. 3109, are contract expenditures a matter of public record and available for public inspection (unless otherwise provided by law or Executive order)? N/A

B. CONSTRUCTION

1. FAA Sec. 601(d). If capital (e.g., construction) project, will U.S. engineering and professional services be used? Yes, to extent feasible
2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable? N/A
3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed \$100 million (except for productive enterprises in Egypt that were described in the CP), or does assistance have the express approval of Congress? N/A

C. OTHER RESTRICTIONS

1. FAA Sec. 122(b). If development loan repayable in dollars, is interest rate at least 2 percent per annum during a grace period which is not to exceed ten years, and at least 3 percent per annum thereafter? Yes.
2. FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights? N/A

3. FAA Sec. 620(h). Do arrangements exist to insure that United States foreign aid is not used in a manner which, contrary to the best interests of the United States, promotes or assists the foreign aid projects or activities of the Communist-bloc countries?
4. Will arrangements preclude use of financing:
- a. FAA Sec. 104(f); FY 1989 Appropriations Act Secs. 525, 536. (1) To pay for performance of abortions as a method of family planning or to motivate or coerce persons to practice abortions; (2) to pay for performance of involuntary sterilization as method of family planning, or to coerce or provide financial incentive to any person to undergo sterilization; (3) to pay for any biomedical research which relates, in whole or part, to methods or the performance of abortions or involuntary sterilizations as a means of family planning; or (4) to lobby for abortion? N/A
- b. FAA Sec. 483. To make reimbursements, in the form of cash payments, to persons whose illicit drug crops are eradicated? Yes.
- c. FAA Sec. 620(g). To compensate owners for expropriated or nationalized property, except to compensate foreign nationals in accordance with a land reform program certified by the President? Yes.
- d. FAA Sec. 660. To provide training, advice, or any financial support for police, prisons, or other law enforcement forces, except for narcotics programs? Yes.
- e. FAA Sec. 662. For CIA activities? Yes.

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- f. FAA Sec. 636(j). For purchase, sale, long-term lease, exchange or guaranty of the sale of motor vehicles manufactured outside U.S., unless a waiver is obtained? Yes.
- g. FY 1989 Appropriations Act Sec. 503. To pay pensions, annuities, retirement pay, or adjusted service compensation for prior or current military personnel? Yes.
- h. FY 1989 Appropriations Act Sec. 505. To pay U.N. assessments, arrearages or dues? Yes.
- i. FY 1989 Appropriations Act Sec. 506. To carry out provisions of FAA section 209(d) (transfer of FAA funds to multilateral organizations for lending)? Yes.
- j. FY 1989 Appropriations Act Sec. 510. To finance the export of nuclear equipment, fuel, or technology? Yes.
- k. FY 1989 Appropriations Act Sec. 511. For the purpose of aiding the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights? Yes.
- l. FY 1989 Appropriations Act Sec. 516; State Authorization Sec. 109. To be used for publicity or propaganda purposes designed to support or defeat legislation pending before Congress, to influence in any way the outcome of a political election in the United States, or for any publicity or propaganda purposes not authorized by Congress? Yes.
5. FY 1989 Appropriations Act Sec. 584. Will any A.I.D. contract and solicitation, and subcontract entered into under such contract, include a clause requiring that U.S. marine insurance companies have a fair opportunity to bid for marine insurance when such insurance is necessary or appropriate? Yes.