ENVIRONMENTAL SANITATION PROGRAM FOR SALVADOR AND THE MUNICIPALITIES OF TODOS OS SANTOS BAY

(BR-0203)

EXECUTIVE SUMMARY

BORROWER: State of Bahia

GUARANTOR: Federal Government of Brazil

EXECUTING AGENCY: Secretary of Water Resources, Sanitation, and Housing [Secretaria de Recursos Hídricos, Saneamento e Habitação] (SRHSH)

AMOUNT AND SOURCE:

	(millions in US$)
IDB: OC	US$254 (foreign exchange)
	US$ 10 (local currency)
Local Counterpart	US$176
Total:	US$440

FINANCIAL TERMS AND CONDITIONS:

	Loan OC
Amortization period:	25 years
Disbursement period:	5 years
Interest rate:	variable on foreign exchange, 4% local currency
Inspection and supervision:	1 %
Credit fee:	0.75% p.a. (on foreign exchange)

OBJECTIVES: The program has two interrelated objectives: They are to: (a) improve the quality of life of the 2.7 million inhabitants living in the Todos os Santos Bay area by expanding collection and proper disposal of sewage and solid waste, increasing water service coverage, and reducing industrial pollution; and (b) continue strengthening local Government institutions whose activities can positively affect the environment of the Todos os Santos Bay region.

DESCRIPTION: The program will finance the following five subprojects:

(a) Sewage Collection and Treatment (US$232,200,000). This subproject includes house connections, trunk lines, pumping stations, and expansion and construction of treatment facilities. These works will: (i) increase the household sewerage service

levels in Salvador Municipality from 26% to 82%; (ii) provide sewerage services in at least eight municipalities in the Todos os Santos Bay area to 70% of households. These municipalities currently have no municipal sewerage service; (iii) eliminate 95% of household connections to the drainage system in the project area; and (iv) eliminate sewage discharge points from beaches in the Salvador area.

(b) Potable Water Supply (US$20,000,000). This subproject includes water pumping stations, distribution tanks and networks, and household connections. These works will increase household water coverage levels in participating municipalities from as low as 57% to 80%.

(c) Institutional Strengthening of the Environmental Resource Center [Centro de Recursos Ambientais] (CRA) (including industrial pollution control) (US$6,200,000) the Bahia Water and Sanitation Company [Empresa Baiana de e Saneamento, S.A.] (EMBASA) (US$38,400,000, including US$18,400,000 for water meters) and the Secretary of Finance (US$10,000,000). For CRA, this subproject includes technical assistance and equipment to upgrade CRA's capability to continue its program of industrial pollution control, to re-establish its environmental monitoring system, and to develop a mathematical model of the Bay. CRA's industrial pollution control program will: (i) reduce the daily volume of industrial discharges by 91% for COD and 82% for BOD, (for definitions of COD and BOD, see Chapter I); (ii) reduce the volume of amonia entering the Bay by 90%; and (iii) reduce the volume of petroleum residuals entering the bay by 95%. For EMBASA, this subproject will: (i) increase the percentage of households with water meters for all areas serviced by EMBASA (in the State) from 44% to 66%; and (ii) provide equipment and training for water and sewerage maintenance. For the Secretary of Finance, this sub-project includes equipment and training for improved budget administration.

(d) Solid waste collection and disposal (US$9,000,000). This subproject will finance the construction of sanitary landfills in five municipalities and support efforts to increase solid waste collection. This subproject will increase solid waste collection in five municipalities from 50% to 90% and ensure that solid waste is deposited in sanitary landfills.

(e) Establish an on-going environmental education program (US$3,500,000). This subproject will: (a) provide education programs for businesses in industrial pollution control; (b) develop and execute a public education campaign emphasizing the importance of households connecting to the sewerage system; and (c) develop modules for basic environmental programs for primary and adult education.

ENVIRONMENTAL CLASSIFICATION: The Environmental Management Committee classified this as a Category III operation in July 1993. The Environmental Summary was approved on May 2, 1995.

POVERTY-TARGETED CRITERIA: This loan meets the criteria for poverty targeting under the eighth replenishment because over 50% of its beneficiaries are low income (see 5.48). The loan, because it is principally for sanitation, is classified as a social program as defined in paragraph 2.13 of AT-107.

BENEFITS: Benchmarks for each of the five subprojects are detailed in Chapter II. Activities will have a very positive effect on the quality of life of the 2.7 million individuals who reside in the Todos os Santos Bay area. Water coverage rates will increase to 80% in most of the region's municipalities and sewerage coverage rates to 70%. There will be a marked reduction (over 80%) in the volume industrial pollution discharged in the area. Finally, by the end of the project, the area's beaches-which are almost always closed- will be significantly cleaner and open to the public at least 90% of the time.

RISKS: To maximize the program's environmental benefits and to justify economically the high cost of constructing sewage collection and treatment facilities, at least 80% of households will need to connect to the new sewerage system within five years. Without an 80% connection rate, project objectives will not be fully achieved.

In the past, some residents served by EMBASA have been reluctant to connect to new systems and reaching the 80% target has taken ten years or more. The reluctance to connect to the system has been partially the result of high costs, which average about US$125 and which are borne by homeowners. This problem has been compounded by the lack of coordination between the Municipalities and the State in encouraging households to connect through education campaigns and more strict application of local legislation.

The proposed loan addresses this problem through: (a) the creation of a unit within the state-owned EMBASA to deal exclusively with this issue. This unit will include officials from Salvador's Municipal Environmental Secretariat to ensure coordination between the state and the program's major participating municipality; and (b) creating within the program a small revolving loan fund so that residents can finance over a three year period the costs of in-house connections to the system.

THE BANK'S COUNTRY AND SECTOR STRATEGY:

The proposed project fits within the overall strategy developed during the 1994 programming mission. During the mission it was agreed that projects for the 1994/95 operative program would emphasize actions in support of environmental cleanup and protection, management of natural resources, environmental sanitation, and strengthening of public services which manage the environment. The proposed program is fully consistent with this strategy.

Brazil's Federal Government has given priority to the solution of environmental problems an important objective and has requested IDB support in this effort. Since 1992, the Bank has approved six loans to Brazil for sanitation and environmentally related activities for a total of US$1.46 billion. In 1995, a loan for drainage in Campinas is scheduled for approval. Over the next several years, IDB financed loans in the sanitation area are planned for the State of Rondonia, Goias and Goias Velho, Belo Horizonte, and the municipalities of Salvador, Manaus, and a regional sanitation loan for the Northeast.

SPECIAL CONTRACTUAL CONDITIONS:

Prior to first disbursement the contract will require the following:

(a) evidence of establishment of a project executing unit in the SRHSH including a description of its functions and responsibilities, a time-table for hiring personnel, and the organization of an accounting department (see paragraph 4.3);

(b) agreements between the project's co-executors, operators and municipalities establishing mechanisms for coordination and between the State and co-executors for the transfer of funds for each subproject (see paragraph 4.6);

(c) Prior to disbursement for institutional strengthening for improving budget administration, presentation of an execution plan (see paragraph 3.13).

Other special conditions to be included in the contract are:

(a) Six months from loan signature: (i) Presentation of the operating regulations for the household connection fund (paragraph 3.23); (ii) establishment of a unit within EMBASA whose function is to ensure that residents connect to the new sewerage system. This unit would be composed of technicians from EMBASA and Salvador's Municipal Secretariat (see paragraph 2.12); and (iii) Evidence of an agreement between EMBASA and the Instituto Nacional de Seguridad for the refinancing of EMBASA's outstanding debt (see paragraph 4.36).

(b) Twelve months from loan signature: (i) evidence that the Pedra do Cavalo aqueduct has been incorporated as an asset by EMBASA (paragraph 4.33); (ii) presentation of a program for payment of debts owed EMBASA by municipalities (paragraph 4.34); and (iii) evidence that the fund to finance household connections has been established (paragraph 3.23);

(c) Resettlement: (i) prior to adjudicating works where resettlement is required, Bank approval of a resettlement plan (paragraph 2.10); and (ii) 30 days prior to initiating works where resettlement is required, evidence that resettlement has taken place or compensation has been accepted and made (see paragraph 2.10);

(d) Industrial pollution: (i) prior to entering into new commitments for civil works beginning the second year of the project, evidence that the annual goals established in the industrial pollution control plan have been met (paragraph 2.16); (ii) the state shall provide CRA an operating budget which is adequate to undertake its responsibilities as outlined in the loan contract (paragraph 2.17); and (iii) the results of annual pollution control targets will be published in local newspapers (2.16).

(e) Ex-post evaluation: The executing agency has agreed to undertake an ex-post evaluation (paragraph 3.38);

Corr.

(f) Period for initiation of multiple works: All works should be initiated within 4 years from the date the contract becomes effective (paragraph 3.26);

(g) Tariff clauses: (i) EMBASA's income from tariffs should be sufficient to cover operation, maintenance, and depreciation of revaluated assets in operation (paragraph 5.29); and (ii) EMBASA must generate resources to cover debt service and beginning in 1998 at least 30% of the cost for expansion (paragraph 5.30);

(h) Financial conditions: (i) loan funds for the sewerage and water subprojects should be transferred to EMBASA on the same financial terms as those established in the loan contract (paragraph 4.5); (ii) EMBASA's financial statements should be reviewed by a public accounting firm acceptable to the Bank and presented to the Bank annually (paragraph 4.27); (iii) the program's financial statements will be audited by the Tribunal de Contas do Estado (paragraph 3.4); (iv) an annual report should be submitted to the Bank on the status of EMBASA's accounts with the State's municipalities (paragraph 4.34); and (v) EMBASA should collect 85% of receivables from services rendered (paragraph 4.34); and

(i) Procurement limits: For Bank financing, the contract will require international public bidding when the value of goods is US$350,000 and above and when the value of works is estimated at above US$5,000,000 (paragraph 3.28).

I. FRAME OF REFERENCE

A. Review of the Sector

1.1 Brazil's urban population growth and rapid industrialization over past decades have been accompanied by a gradual deterioration in urban environmental quality. The decline in the quality of water sources located near rapidly expanding population centers is one of Brazil's most serious environmental problems, and has occurred as a result of insufficient sectoral investment and unmet demand in sanitation infrastructure, particularly in the collection, treatment and proper disposal of waste water, and in the lack of resources devoted to enforce laws controlling industrial contamination.

1. Water and sewerage systems

1.2 Brazil began to set priorities and address the need for sanitation infrastructure as part of its National Basic Sanitation Program launched in 1971 to cover water supply, sewerage collection treatment, and drainage. Sanitary works financed under this program were planned by the National Water Supply and Sanitation Plan [Plano Nacional de Água e Saneamento] (PLANASA), financed by the Guarantee Fund for Service Time [Fundo de Garantia por Tempo de Serviços] (FGTS) as well as funds from multilateral development banks and administered by National Housing Bank [Banco Nacional da Habitação] (BNH). 1/ At PLANASA's urging, state companies were created to manage sewerage and water works and the water sector underwent a period of rapid investment. Because of comparatively higher financial returns, state water companies generally favored investments in water, and coverage levels increased from 45% in 1970 to 85% in 1990 at the national level. Sewerage investment lagged well behind water and national coverage only increased from 24% to 42% during the same period. 2/

2. Drainage

1.3 While water supply became the domain of large state-run water companies, responsibility for urban drainage and solid waste collection and disposal remained largely the responsibility of municipalities which had limited resources to improve services. Under PLANASA's direction, very limited FGTS resources were made

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1/ In 1986 the BNH was abolished and its main operational responsibilities were transferred to the Caixa Econômica Federal (CEF).

2/ Total investment in water supply, sewerage and sewage treatment for the period 1977-1985 amounted to about US$11 billion, with 70% invested in water supply, and 30% in sewerage collection and treatment. PLANASA's share of this investment during the period equalled about US$9 billion or 80% of the total.

available for drainage (about US$800,000,000 versus nearly US$9 billion for water), as a result, drainage coverage rates were disproportionately low. Current national coverage for drainage works is estimated to be about 40% of need, well below the 85% coverage rates for water.

1.4 In areas without sewerage service, Brazil's municipal drainage systems are plagued by a high incidence of illegal sewage connections (residents, for lack of an alternative, connect sewerage lines to the drainage system). This has seriously compounded the problems of urban pollution as untreated sewage enters the drainage system, ultimately contaminating urban bodies of water.

3. Solid waste collection and disposal

1.5 Improvement in solid waste collection has been financed with local resources and by external donors. Collection rates in larger metropolitan areas average about 80%, with rates for smaller municipalities significantly lower. Collection has proven to be particularly difficult in very densely populated favela areas where access with traditional collection equipment is not possible. For solid waste disposal, landfills construction frequently does not follow environmentally acceptable practices. Leachate infiltration as well as unprotected runoff are commonplace, with the resulting contamination.

4. Environmental policy

1.6 State agencies to monitor environmental quality, license industries, and enforce environmental legislation were created in the 1970s. Major legislation adopted at the Federal level in 1981 created the Sistema Nacional de Medio Ambiente and set minimum pollution standards and laws which provide the basis of Brazil's current environmental policy. This legislation, which was frequently strengthened by States through the development of their own complementary environmental laws, requires a process of environmental licensing and impact assessments as basic instruments. 3/ In general, State agencies gained strength until the 1980's when Brazil's lingering economic crisis resulted in large budgetary cutbacks at the Federal and State level and ultimately to program cuts for most State environmental agencies.

B. The program's setting

1.7 The State of Bahia, located in Brazil's northeast, has 11.8 million people and is the country's fourth most populated state. While Bahia only produces 5% of Brazil's GDP, the state's production accounts for 27% of the northeast's GDP and produces 50% of the

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3/ These instruments are described in detail in the Environmental Summary.

region's exports. Salvador, Bahia's capital, has a population of 2.4 million.

1.8 The Bay of Todos os Santos occupies an area of 500 square km and has a coastline of over 400 km. The twelve municipalities which are adjacent to the Todos os Santos Bay (including Salvador) have a population of 2.7 million (see map and Table II-1) and occupy about 35% of the Bay's coastline.

1.9 From the 1960s to the 1980s, as the State of Bahia economy changed from one which was largely agrarian to a more diverse economy based on industry and tourism, the Bay area's population tripled in size and came to play an increasingly important role in the State's economy and to have an increasingly important influence over the future of Todos os Santos Bay. Today, the area has 46 heavy industries of notable size, a major port, one of the country's largest oil refineries, and an important tourist industry.

C. Sources of contamination

1.10 The rapid urbanization and industrialization of Salvador and the other municipalities of Todos os Santos Bay, the lack of financial resources to expand sanitary services, and the weak capacity of state institutions to keep pace with industrial growth in the enforcement of anti-pollution legislation have contributed to high levels of contamination in the Bay area. At present:

a. the area generates 30,000 kg. per day of biological oxygen demand (B.O.D.) 4/ from domestic sewage. Most of this sewage is dumped untreated via nearly 130 discharge points onto the 19 beaches and the waters of the Todos os Santos Bay;

b. 46 industries dump 23,000 kilos of chemical oxygen demand (C.O.D.) 5/ from organic materials into the Bay every day; and 6/

c. 7000 kilos of petroleum bi-products are dumped into the Bay daily.

4/ B.O.D. is an indirect measure of biodegradable organic matter content. High levels of B.O.D. discharged in a body of water will cause oxygen depletion and eventually make the body of water unable to sustain aerobic aquatic life.

5/ Chemical oxygen demand (C.O.D.) is an indirect measure of biodegradable organic matter which breaks down slowly and is usually produced by industries.

6/ Not included in this total is a small amount of additional industrial waste generated by PoloChemical and treated at the Treatment Liquid Wastes Center [Centro de Tratamento de Efluentes Liquidos] (CETREL) located in the municipality of Camacari.

D. Consequences of contamination

1.11 Domestic and industrial contamination is having a negative impact on the ecosystem of the Salvador metropolitan area and the quality of life in the area. Consequences of this contamination include:

a. permanent closure of every one of the area's 19 beaches all year because the presence of coliforms exceeds levels permitted by Brazilian health standards and pose a significant health hazard; and 7/

b. a significant increase in the area's susceptibility to water borne diseases 8/.

E. Infrastructure and urban services--present situation

1. Sanitation

1.12 The Bahia Water and Sanitation Company [Empresa Baiana de Águas e Saneamento, S.A.] (EMBASA), which forms part of the Department of Water Resources, Sanitation, and Housing [Secretaria de Recursos Hídricos, Saneamento e Habitação] (SRHSH), is the state-owned company charged with providing potable water and sanitation services in most of the State's urban areas.

1.13 To meet the demands of rapidly growing urban populations, EMBASA, like the majority of state-owned water companies, allocated available resources to water supply, deferring more expensive investments in sewage collection, treatment, and disposal. By 1995, 84% of households in Salvador municipality had potable water and neighboring municipalities had coverage levels ranging from 57% to 90% (see table II-1). Coverage levels for sewage collection and treatment are significantly lower with Salvador municipality having coverage rates of 26% and no coverage in the remaining municipalities of the program area.

2. Sewage collection and treatment and disposal

1.14 The 26% 9/ of sewage which is collected in Salvador is pre-treated and disposed of through an ocean outfall (now being utilized at 12% of its capacity) located at the southern point of

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7/ High levels of coliforms are the result of raw sewage, are associated with diseases in humans, and directly affect the usability of beaches. For direct contact with water, total coliform levels of over 5000/100ml are considered to be dangerous to humans, those over 1000/100ml are unacceptable by international standards. In Brazil, beaches are closed when coliform levels exceed 5000/100ml.

8/ For example, there were no cases of cholera in 1988, 3,500 cases in 1992 and only 450 cases in 1993.

9/ For coverage rates see Table II-1.

Salvador (see map). Untreated sewage enters the Bay via canals, illegal connections to the drainage system, and through over 130 drainpipes which dump raw sewage directly onto Salvador's beaches.

3. Control of industrial contamination

1.15 In Bahia, responsibility for environmental monitoring, enforcing state and federal legislation, and regulating effluents through licensing existing and new industrial activity rests with the Environmental Resource Center [Centro de Recursos Ambientais] (CRA). During the late 1970s and early 1980s, CRA's institutional capacity for monitoring and enforcement was gradually strengthened along with the development of an increasingly rigorous set of environmental laws. By the mid 1980s, CRA had the legal means to control activities affecting the State's environment. Throughout this period CRA's budget and staff fluctuated greatly from year to year limiting its capacity to consistently monitor environmental quality and to enforce industrial pollution control legislation.

4. Solid waste collection and final disposal

1.16 The Salvador Metropolitan Area Development Company [Companhia de Desenvolvimento da Região Metropolitana] (CONDER), a state-owned development company, was charged in the late 1980's with the task of improving collection and disposal of solid waste in the Municipalities of the Salvador area. Due to CONDER's efforts and the resources of a US$70,000,000 World Bank Program for Solid Waste now in its final months, collection rates in all but five of the program area's municipalities will exceed 90% by the end of the 1995, and four sanitary landfills for disposal of these wastes will be completed in early 1996.

F. Summary

1.17 The increasing environmental deterioration of the Todos os Santos Bay region has arisen as a result of: (a) the area's rapid urbanization and industrialization; (b) low levels of investment in sanitation services; and (c) the lack of capacity to monitor compliance with and enforce environmental legislation.

1.18 The proposed program, whose details are described in Chapter II, will address the deterioration through a comprehensive effort to: (a) provide domestic sewage collections and appropriate disposal services to most of the population; (b) provide water to those not now being serviced by a public water system; (c) strengthen CRA's capacity to monitor environmental quality and control industrial pollution; (d) improve solid waste collection and disposal in the five municipalities outside the area of the World Bank's program for solid waste; and (e) provide environmental education. Described below are the steps taken by Bahia in preparation for the proposed program.

1. Steps taken in preparation for the proposed program

a. Status - late 1992

(i) EMBASA

1.19 When the Bank undertook its first Mission to prepare this program in December 1992, the solid waste program (CONDER) for the Salvador metropolitan region was well underway. However, EMBASA was not eligible to receive Bank financing because there was a substantial gap between EMBASA's income from tariffs and its expenditures. 10/ Within the context of the IBRD's Water Modernization project, a US$250,000,000 11/ loan approved in 1992, EMBASA had begun to take serious measures to close EMBASA's financial gap and place it on sound commercial footing (the IBRD was disbursing for institutional modernization but was holding all disbursements for investments for water supply in Salvador until its income was sufficient to cover its expenses).

(ii) CRA

1.20 In the area of control of industrial pollution, there were serious problems. CRA was severely understaffed and under-budgeted. Overall monitoring of water quality had ceased as had follow-up with licensing of industries. The result was that many of the region's 46 major industries were either operating without valid licenses or were discharging contaminants in excess of that allowed under their licenses.

2. Reforms taken in preparation for the proposed program

1.21 Viewing the proposed program as very high priority, the State undertook a series of measures to prepare for the proposed program. Between December of 1992 and March of 1995 very substantial progress was made in the reform of EMBASA, CRA and in the area of drainage and solid waste.

1.22 Reform measures taken by EMBASAincluded tariff increases of 20% in real terms and substantial reductions in personnel of nearly 8%, and the company reduced its costs and increased its income. With the elimination of its financing gap, EMBASA substantially improved the commercial aspects of its operation and became eligible for Bank financing by late 1994.

1.23 In 1994, the State significant increased CRA's operating budget. With these additional budgetary resources, CRA hired additional qualified staff and initiated an industrial pollution control

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10/ The Bank's policy on public utility tariffs requires that tariffs on the date of loan approval should be adequate to cover all operating and maintenance costs.

11/ 50% of these resources are earmarked for EMBASA.

program. By early 1995, CRA had analyzed the effluents from the area's 46 major industries, had shut down four industries, and had reached agreement with most of the remaining industries for substantial reductions in their industrial discharges.

1.24 In the solid waste area, significant solid waste improvements in collection has taken place and landfill construction was underway as the IBRD loan neared completion. In drainage, discussions between the Municipality of Salvador and the IDB were initiated for a major program. Additionally, the Perfeitura had tentatively agreed to work with the State in ensuring that residents of Salvador disconnect from the drainage system and connect to new sewerage systems to be constructed in the area.

G. Bank strategy

1.25 The proposed program fits within the overall strategy developed during the 1995 programming mission. During the mission it was agreed that, among the priorities, projects for the operative program would emphasize actions in support of environmental cleanup and protection, management of natural resources and strengthening of public services which manage the environment. The proposed program is fully consistent with this strategy.

1.26 Brazil's Federal Government has made the solution of environmental problems an important priority and has requested IDB support in this effort. Since 1992, the Bank has approved six loans to Brazil for sanitation and environmentally related activities for a total of US$1.46 billion. The proposed program is scheduled for approval in 1995 as is a loan for Campinas for drainage. Over the next several years, IDB financed loans in the sanitation area are planned for the municipalities of Recife, Salvador, Joinville, Porto Alegre, the Federal District, the State of Goias, and a regional program for the Northeast.

II. THE PROGRAM

A. Objectives

2.1 The program has two interrelated objectives. They are to: (a) improve the quality of life of the 2.7 million inhabitants living in the Todos os Santos Bay area by expanding collection and proper disposal of sewage and solid waste, increasing water service coverage, and reducing industrial pollution; and (b) continue efforts to strengthen the local Government institutions whose activities can positively affect the environment of the area. The program is the first phase of what is likely to be a two phased effort.

B. Subprojects

2.2 This US$440,000,000 first phase will finance five subprojects. These subprojects represent an integrated approach to addressing the series of problems outlined in the first chapter and will build upon efforts initiated by the Government of the State of Bahia. The five subprojects are:

a. Sewage collection and treatment (US$187,200,000 for Salvador and US$45,000,000 for other municipalities);

b. Potable Water Supply (US$20,000,000);

c. Institutional strengthening of the Centro de Recursos Ambientais - including industrial pollution control (US$6,200,000) EMBASA (US$38,400,000); and the Secretary of Finance (US$10,000,000);

d. Solid waste collection and disposal (US$9,000,000); and

e. Environmental Education (US$3,500,000).

C. Geographic focus

2.3 Program activities will focus principally on those twelve municipalities which are adjacent to Todos os Santos Bay. A map with the location of all activities is included at the beginning of this document. Table II-1 summarizes sewerage, and potable water, before and after the program for each of the twelve municipalities.

TABLE II-1

CURRENT AND PROJECTED SERVICE LEVELS

MUNICIPALITIES ♦	1995			2001		
	POPULATION	WATER %	SEWERAGE	POPULATION	WATER %	SEWERAGE
Salvador *	2,424,110	84%	26%	2,746,560	**90%	*** 82%
Candeias	70.056	71%	-	79.245	80%	70%
Simões Filho	57.370	85%	-	64.528	85%	73%
Santo Amaro	37.979	86%	-	42.014	86%	70%
Vera Cruz	27.348	57%	-	31.551	80%	70%
Itaparica	16.226	57%	-	18.807	80%	70%
Muritiba	14,709	50%	-	25.534	80%	70%
S. F. do Conde	14.473	71%	-	18.002	80%	70%
Maragojipe	13.900	62%	-	14.322	80%	70%
Cachoeira	12.784	82%	-	13.435	82%	70%
Madre de Deus	9.411	90%	-	10.063	89%	80%
São Félix	7.718	65%	-	8.112	80%	70%

* Includes Lauro de Freitas.

** Projected increase of water coverage for Salvador is a result of works financed under the World Bank's Modernization Program.

*** Projected domestic sewerage service for Salvador includes projections for World Bank financed works under the Modernization Program. Works to be constructed by the World Bank would raise service levels to 35%. IDB and World Bank works combined are projected to raise service levels to 82%.

♦ For cities outside Salvador, projections for water (where levels are currently below 80%) and sewerage assume participation in the program. As pointed out in the benchmarks, only 8 of the 11 municipalities outside Salvador will participate in this first phase of the program.

D. Phasing

2.4 Subprojects in this first phase are detailed below. The sewage collection and treatment subproject includes the very highest priority works in Salvador's sewerage master plan. These works, which are minimum cost solutions, will maximize the use of existing infrastructure including an under-utilized ocean outfall. A mathematical model of the Bay developed as part of this program is viewed as critical to determining second phase works. The second phase of works may include improved treatment in some areas where primary treatment is to be financed in this first phase, further expansion of the sewerage network and number of household connections, and continued enforcement of pollution controls. 12/

12/ For additional detail see Chapter V.

E. Execution

2.5 As detailed in Chapters III and IV, the SRHSH will take the lead in program coordination through an executing unit established in the SRHSH. The program's co-executors are EMBASA: for sewerage and water works; CRA for industrial pollution control, environmental education, and a mathematical model of the Bay; and CONDER for solid waste collection and disposal.

F. Benefits

2.6 Benchmarks for each of the five subprojects are discussed below. Subprojects will have a very positive effect on the quality of life of the 2.7 million individuals who reside in the Todos os Santos Bay area. Water coverage rates will increase to 80% in most of the region's municipalities and sewerage coverage rates to 70%. There will be a marked reduction (over 80%) in the volume of industrial pollution discharged in the area. Finally, by the end of the project, the area's beaches will be significantly cleaner and open to the public 90% of the time.

G. Description of subprojects

2.7 The subprojects, including their benchmarks, location, executing agencies and works, are described below:

1. Sewage collection and treatment subproject (US$187,200,000 for Salvador and US$45,000,000 for other municipalities) 13/

a. Benchmarks

2.8 This subproject, which is the program's largest, will:

a. increase the household sewerage service levels in Salvador Municipality from 26% to 82%;

b. provide sewerage services in at least eight other Bay area municipalities (outside Salvador) at a coverage level of 70% of households;

c. eliminate at least 95% of illegal household connections to the drainage system in the program area; 14/ and

d. eliminate sewage discharge points from beaches in the area.

13/ Designs for Salvador and the sample have been reviewed and approved by the project team.

14/ This will be accomplished through providing sewerage collection services and controlling illegal connections.

b. Works

(i) Salvador sanitation system

2.9 The loan will finance construction of house connections, trunk lines, pumping stations and expansion of the Salvador ocean outfall's existing pre-treatment station. For the municipality of Salvador, works to be constructed would maximize use of the existing ocean outfall located at the southern point of Salvador Municipality (see MAP) and now being utilized at 12% capacity. Basic designs have been prepared for the Salvador system. These designs are the basis of the cost estimates. The Salvador sanitation system is the largest and most costly system to be financed by the loan. Its total cost is estimated to be US$187,200,000 and will serve an estimated 1.3 million residents of Salvador.

(ii) Resettlement for Salvador sanitation system

2.10 Construction of sewerage works in the Municipality of Salvador will require the resettlement of approximately 45 families dispersed throughout the municipality of Salvador where works will be constructed. 15/ Before construction of works, families will be resettled in phases to coincide with the schedule of works. A draft resettlement plan has been reviewed by the Bank. The Bank's approval of a final resettlement plan will be required as a condition to adjudicating works and evidence of resettlement or compensation 30 days prior to initiating works. Residents will be offered resettlement which is as close as possible to existing residences in comparable housing to be constructed. Initial interviews have been held with affected residents and in most cases resettlement sites, which are in very close proximity to existing residences, have been identified. To simplify phasing the construction of works with housing, the same contractor will be used for both activities. EMBASA's Division of Patrimony, which has had extensive experience in this area, will oversee the resettlement.

(iii) Sanitation systems for adjacent municipalities

2.11 The program will provide sewerage service in at least 8 (of the 11) other municipalities outside of Salvador to 70% of households. For these municipalities the program will fund house connections, trunk lines, pumping stations and primary treatment facilities. The cost of providing service to eight of the municipalities is estimated to be US$45,000,000. Cost estimates for these systems are based on a design from the two largest municipalities outside of Salvador in the region, Candeias and Simões Filho.

15/ An additional 51 families opted for a cash settlement and will be reimbursed for value of their housing.

(iv) Clean-up of the drainage system

2.12 To maximize the impact of these new investments in sanitation by ensuring that at least 80% of households in the program areas connect to the new sewerage system, local counterpart will finance a new unit to be established within EMBASA, composed of technicians from the Municipality of Salvador's Environmental Secretariat and EMBASA, to encourage residents (and if necessary enforce legislation) in the program area to disconnect from the drainage system and connect to the new sewerage system. 16/ The coordination between the Municipality and the State is critical to the success of the program since the responsibility for enforcement of legislation requiring connections to the new system rests with the Municipality. As an additional incentive, EMBASA will establish a small rotating fund to provide some financing for low income residents in need of funds for in-house connections. Loans of up to US$250 per household will be available for financing up to 36 months and payable as part of monthly issued water/sewage bills.

2. Potable water supply subproject (US$20,000,000)

a. Benchmarks

2.13 This subproject will increase household water coverage levels in participating municipalities (those receiving sewerage programs) to 80%.

b. Works

Municipal water supply systems

2.14 The water supply works included in this program are designed to benefit underserved municipalities outside of Salvador (see map) whose coverage levels are less than 80%. 17/ Funds will finance water intakes, supply lines, distribution tanks, pumping stations, distribution networks, and household connections with their respective meters. Cost estimates for these systems are based on a sample of two projects, one is for the integrated system of Reconcavo that provides water for Simões Filho, Candeias and Madre de Deus, and a second smaller system designed for Maragojipe.

16/ Evidence of establishment of this unit will be a condition to be met within six months of contract signature.

17/ In the case of the municipality of Salvador, the World Bank's water sector modernization project will increase coverage from 84% to 90%.

3. Institutional strengthening of the CRA (including industrial pollution control) (US$6,200,000) EMBASA (US$38,400,000), and the Secretary of Finance (US$10,000,000).

a. Benchmarks

2.15 This subproject will:

(i) For CRA

a. establish a program of industrial pollution control for the region's forty six largest industries which will:

(i) reduce the daily volume of industrial discharges generating chemical oxygen demand (COD) entering the Bay by 91% (from 27,200 kg to 2,500 kg);

(ii) reduce the volume of industrially discharges generating biological oxygen demand (BOD) by 82% (from 22,900 kgs/day to 4,200 kg/day);

(iii) reduce the volume of amonia entering the Bay by 90% (from 1,500 kg to 148 kgs/day); and

(iv) reduce the volume of petroleum residuals entering the Bay by 95% (from 7,289 kgs/day to 341 kgs/day).

b. establish within CRA the capacity to enforce environmental legislation and to monitor environmental quality; and

c. develop a mathematical model of the Bay;

(ii) For EMBASA

a. increase the percentage of households with water meters for all areas services by EMBASA (in the State) from 44% to 66%; and

b. improve EMBASA's maintenance capability for water and sewerage systems through equipment replacement and training.

(iii) For the Secretary of Finance

a. initiate a program of improved budget administration.

b. Actions/CRA

Industrial pollution control and environmental monitoring (US$6,200,000)

2.16 As mentioned in Chapter I, CRA has developed the principal elements of an industrial pollution control subprogram in preparation for the loan. Further, CRA has reached agreement on significant reductions in industrial emissions with many of the 46 major

industries which generate 95% of industrial discharges. Appropriately, CRA has focussed most of its efforts on reaching agreements with those ten industries which contribute 90% of the volume of industrial pollution, including PETROBRAS, who has agreed to install equipment to eliminate 90% of petroleum generated discharges by 1996. . Adherence to the plan for reduction of industrial discharges (see Table II-2) will be a condition to annual commitments beginning the second year of the program. A condition is included in the loan contract requiring that the results of the program will also be published in local newspapers.

TABLE II-2
Plan for Reduction in Industrial Discharge from Major Industries in the Program Area

TOTAL GERAL

PARAMETERS	UNITS	ACTUAL (1995)	1996	1997	1998	REDUCTION	
		CARGA					%
Chemical oxygen demand	kg/d	27,247	7,955	5,507	2,555	24,692	91
Biological oxygen demand	kg/d	22,946	11,495	5,515	4,219	18,727	82
Amonia	kg/d	1,524	148	148	148	1,376	90
Petroleum products	kg/d	7,289	377	341	341	6,948	95
Solid Sediments	1/d	61	8	8	8	53	87
Metals	kg/d	61	9	9	9	52	85
Sulphate	kg/d	109	21	19	19	90	83

2.17 Program resources will be used to provide technical assistance and equipment to upgrade CRA's capability to continue its program of industrial pollution control and to re-establish its environmental monitoring system, including the 46 industries and beaches for which specific control targets are being developed. It will also finance an "environmental auditor", who will examine annually progress toward meeting industrial pollution control targets. The loan contract will obligate the State to provide CRA an operating budget which is adequate to undertake its responsibilities, which will be in Annex A of the loan contract.

2.18 Finally, to provide a basis on which to monitor the Bay's water quality, the program will finance the development of a mathematical model of the Bay. The model will simulate Todos os Santos Bay and the contiguous coastal ecosystem dynamics and will take 18-24 months to develop. Its characteristics will include: (a) spatial, horizontal two dimensional solving; (b) temporal; transient in time; and (c) numerical technique. The model will be critical to identify and prioritize second phase investments in the area.

c. Actions/EMBASA

(i) Water meters (US$18,400,000)

2.19 To compliment the State's efforts at placing EMBASA on sound commercial footing 18/ (including increasing the efficiency of billing, cutting expenses including water losses, and increasing income) the program includes financing for the procurement and installation of 270,000 meters. The purchase and installation of these meters will raise meter coverage levels state-wide from 44% to 66% unaccounted water. This increased coverage level should significantly reduce and optimize EMBASA's investment.

(ii) Maintenance capability, water and sewerage systems (US$20,000,000)

2.20 While the operational aspects of the company's operation have improved significantly through its own initiative with the help of the IBRD's Modernization Program, there is still a need for maintenance equipment and training for existing and new systems in the program area. Funds will be used for equipment to provide predictive and preventive maintenance equipment for pumping and treatment systems and water meters. Training in maintenance will also be provided.

d. Actions/Secretary of Finance (US$10,000,000)

2.21 To initiate a program to improve budget administration, the Secretary of Finance is preparing an execution plan to satisfy the contract's condition to disbursement for this activity. The program will finance equipment, software, and training to improve tax collection.

4. Solid waste collection and disposal (US$9,000,000)

a. Benchmarks

2.22 This subproject will:

a. increase solid waste collection coverage in the municipalities of Cachoeira, Maragojipe, São Félix, Santo Amaro and Muritiba from 50% to 90%; and

b. ensure that all solid waste is deposited in sanitary landfills.

18/ EMBASA's institutional development program is discussed in Chapter I. These efforts are financed in part by the IBRD's Water Sector Modernization Project.

b. Works

2.23 As discussed in Chapter I, the IBRD funded loan for solid waste in the Northeast will be completed shortly and the goal for 90% coverage for the Salvador region reached. However, there were five municipalities which were not included in the World Bank Project. This subproject, to be executed by the CONDER, would finance the final designs and construction of five municipal landfills in these municipalities (Cachoeira, São Félix, Muritiba, Maragojipe and Santo Amaro). The borrower has agreed to submit to the Bank for review two integrated solid waste collection and disposal system designs.

2.24 Cost estimates for the five landfills to be constructed under this program are based on similar works executed by CONDER under the IBRD financed program. When construction of the landfills is completed, these works would be transferred to the municipalities for management, with CONDER providing initial technical assistance. Additional equipment to increase collection would be funded by local counterpart. CONDER has analyzed collection problems in each of the five municipalities and has developed programs to increase coverage. Responsibility for collection will continue to rest with the municipalities who will receive ongoing technical assistance from CONDER.

5. Environmental education (US$3,500,000)

a. Benchmarks

2.25 This subproject will establish an ongoing environmental education program.

b. Actions

2.26 Coordinated by CRA, with the participation of EMBASA and CONDER, this program will: (a) provide education programs for businesses in industrial pollution control; (b) develop and execute a public education campaign emphasizing the importance of proper waste disposal with particular emphasis on he importance of households connecting to the sewerage system; and (c) develop modules for basic environmental programs for primary and adult education.

6. Costs of the program

2.27 The total cost of the program is estimated at US$440,000,000, distributed per the financial plan below:

Total Cost and Financing Plan
(US$ millions)

CATEGORIES	BID-OC	BID-LC	LOCAL	TOTAL	% TOTAL
1. Engineering and Administration	12000	0	14000	26000	5.9
1.1 General Management	0	0	3500	3500	.7
1.2 Technical Consultancy	2000	0	2500	4500	1
1.3 Technical Management	8000	0	5000	13000	2.9
1.4 Project Design	2000	0	3000	5000	1.1
2. Direct Costs	201400	9900	95090	306400	69.6
2.1 Salvador sewerage system	112200	0	75000	187200	42.5
2.2 Institutional strengthening	32700	0	12500	45200	10.2
- Micro-meters	14000	0	5000	19000	4.3
- Maintenance equipment	5000	0	1000	6000	1.3
- Operational equipment	10500	0	1500	12000	2.7
- Personnel training	0	0	2000	2000	.4
- C.R.A.	3200	0	3000	6200	1.4
2.3 Other Municipalities	56500	9900	7590	74000	16.8
- Potable water supply	16000	2900	1090	20000	4.5
- Sewerage system	36000	7000	2000	45000	10.2
- Solid Wastes	4500	0	4500	9000	2.
3. Concurrent Costs	16500	0	8500	25000	5.6
3.1 Expropriation	0	0	4500	4500	1
- Salvador	0	0	2500	2500	.5
- Other municipalities	0	0	2000	2000	.4
3.2 In-house connection fund	7000	0	0	7000	1.5
3.3 Environmental Education	3500	0	0	3500	.7
3.4 Inst. streng/Secretary of Finance	6000	0	4000	10000	2.2
Sub-Total	229900	9900	117590	357390	81.2
Unallocated	21560	0	10905	32465	7.3
4. Contingencies	16640	0	10905	27545	6.2
4.1 Costs escalation	4920	0	0	4920	1
5. Finances Charges	2540	100	47505	50145	11.3
5.1 Interest	0	0	42755	42755	9.7
5.2 Credit fee	0	0	4750	4750	1
5.3 Inspection and supervision	2540	100	0	2640	.6
TOTAL	254000	10000	176000	440000	100
% FUND/PROJECT	57.7	2.3	40	100	

a. Resources from the Bank

2.28 The Bank will finance 60% of program costs, or US$264,000,000 in ordinary capital (US$254,000,000 in foreign exchange, and US$10,000,000 in local currency).

Terms and Conditions	Foreign Exchange (OC)	Local Currency (OC)
Interest	Variable	4,0%
Credit fee	0,75%	-
Inspection and supervision	1,0%	1,0%
Disbursement	5 years	5 years
Grace period	5 years	5 years
Amortization period	25 years	25 years

b. Local contribution

2.29 Resources for local counterpart, which represent 40% of total costs, will be provided by the State. The impact of this contribution on the State's budget is discussed in Chapter IV.

III. PROGRAM EXECUTION

A. Executing agency

3.1 Program execution will be the responsibility of the Bahia State Secretary of Water Resources, Sanitation and Housing [Secretaria de Recursos Hídricos, Saneamento e Habitação], where an executing unit will be established. The executing unit will be supported by specialized consulting services and a consulting firm that will be hired to supervise construction work.

B. Subexecuting agencies

3.2 The executing agency will be responsible for program coordination and will be the only agency acting as a liaison with the Bank. Each subproject will be implemented by a corresponding coexecuting agency, as follows:

a. EMBASA: sanitary sewerage service for Salvador, water supply and sanitary sewerage service for the other Todos os Santos Bay area municipalities, and institutional strengthening (water meters, operation and maintenance equipment, staff training, etc.)

b. CRA: mathematical model of Todos os Santos Bay and its drainage basins, water quality monitoring in Todos os Santos Bay and its catchment area, environmental education, and institutional strengthening (testing and measuring equipment, laboratory, etc.)

c. CONDER: solid waste systems for five project area municipalities and institutional strengthening of the respective local governments.

3.3 Each co-executor will be responsible for all tasks pertaining to issuing calls for bids, preparing terms of reference for the procurement of consulting services, awarding contracts to consulting firms, construction companies, and suppliers of goods and services, project review and evaluation, and all technical or administrative activities associated with the execution of the respective subproject.

3.4 The executing unit will be in charge of furnishing the Bank with the financial statements of the program, duly audited by the Bahia State Auditing Office. (Tribunal de Contas).

C. Execution

3.5 The program has been divided into specific subprojects and multiple-works subprojects for execution purposes.

1. Specific subprojects

3.6 In light of the integrated, mutually dependent nature of their component parts, sanitary sewerage works for the municipality of Salvador have been designed for execution as a specific subproject. EMBASA has hired consulting firms to prepare the studies and designs for these works based on an existing master plan updated in 1993 to take into account shifts in the spatial distribution of demand.

3.7 In addition, institutional strengthening subprojects have been designed for EMBASA and the CRA in an effort to support agencies with environmental protection responsibilities.

2. Multiple-works subprojects

3.8 The water supply subproject and the sewage collection, treatment, and final disposal subproject for Todos os Santos Bay area municipalities, consisting of a series of similar, self-contained projects, would be executed as a global multiple-works project. The designs for the water supply and sewerage works envisioned for these municipalities were prepared by consulting firms hired by EMBASA. The set of designs was used as the basis for selecting the sample of projects to be included in the program. 19/

3.9 The solid waste collection and final disposal subproject for five Todos os Santos Bay area municipalities will also be executed under a global multiple-works arrangement in view of the similarity and free-standing nature of each of the works involved. A solid waste master plan for the five municipalities was prepared by consultants hired by CONDER.

D. Status of program preparation

1. Salvador sanitary sewerage system

3.10 A master plan for expanding Salvador's sanitary sewerage system was prepared in 1984 and updated in 1993 (see paragraph 5.31). Since the least-cost solution selected for program purposes depends on proper operation of the existing ocean outfall, a series of studies, measurements, and on-site inspections were performed to establish its hydraulic and dilution capacity and current operational conditions. The findings were satisfactory in all cases.

2. Water supply and sanitation service for area municipalities

3.11 From the universe of municipalities located in the program area, EMBASA provided the Bank with 14 designs for a direct cost of

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19/ Annex III includes verifiable indicator for construction and reductions in illegal connections to the drainage system.

approximately US$40 million to make up the program sample. Four feasible projects were selected on the basis of the technical, socioeconomic, and environmental evaluation conducted. Two are water supply projects and two sewerage projects. The remaining projects will need to be reviewed and reformulated to service the most densely populated areas of the municipality and/or make use of unconventional technology (the "condominial" system) in municipalities in which the layout of the streets and the location of dwellings make such a solution advisable.

3. Solid waste systems for area municipalities

3.12 CONDER has drawn up a solid waste master plan for five municipalities: Santo Amaro, Cachoeira, São Félix, Muritiba, and Maragojipe. This master plan was reviewed by the Bank, which made a series of recommendations for its optimization. The final design for the Camaçari and Dias D'Avila solid waste system recently prepared for CONDER, representing a least-cost solution for a city similar to the municipalities to be included in the proposed program, has also been reviewed. The final design for the municipalities targeted by the proposed program will be prepared with program resources. The prospective executing agency must submit designs for at least two solid waste collection, treatment, and final disposal systems for any of the above-mentioned municipalities for Bank approval prior to issuing calls for bids for construction works under this subproject.

4. Institutional strengthening

3.13 EMBASA and the CRA have furnished the Bank with lists of materials, equipment, and training needs for inclusion in the institutional strengthening component for the agencies, as well as the terms of reference for the consulting services to be hired to develop a mathematical model for monitoring water quality in the bay. The Secretary of Finance will submit an execution plan as a condition prior to disbursement for funds to improve tax administration.

5. Environmental education

3.14 The CRA has prepared an environmental education program in cooperation with the other coexecuting agencies, which has been presented to the Bank and deemed adequate.

E. Eligibility criteria for multiple-works projects

1. Water supply and sewerage

3.15 Multiple-works projects must meet the following program eligibility criteria:

a. Eligibility criteria for municipalities: Eligible municipalities are those serviced by EMBASA and located in the program area.

b. General eligibility criteria for water supply and sewerage projects: (i) the project must represent the least economic cost solution, including incremental investment, operation, and maintenance costs computed in present value using a 12% discount rate; (ii) the project's cost-benefit analysis must yield an economic internal rate of return of at least 12%; (iii) the project must ensure that at least 85% of the target population will be allocating no more than 3% of its household income in the case of water supply projects and 5% in the case of water supply and sanitary sewerage projects for payment of the minimum service charge or must include a plan for subsidizing low-income customers acceptable to the Bank; (iv) the project must include an environmental impact assessment report prepared in accordance with the terms of reference used as basis for the appraisal of the sample projects; and (v) in the case of localities with historic site status, the project must be approved by the Historic Heritage Institute.

c. Specific criteria for water supply projects: (i) the municipality must be targeted for the construction of sanitary sewerage works with program resources; (ii) there must be a safe water source with an appropriate flow and quality level to meet demand for a design period of approximately 20 years, along with the necessary legal instruments to secure its use for that period. For projects using groundwater sources, the results of tests conducted in wells or boreholes must be provided; and (iii) projects using existing systems must include a plan for reducing unaccounted-for water, addressing physical as well as commercial losses.

d. Specific criteria for sanitary sewerage projects: (i) the project site must have an existing water supply system operated and maintained in accordance with generally accepted engineering practices, with a coverage rate of at least 80%; and (ii) the sewage treatment level established for program purposes must be in keeping with the absorptive capacity of the receiving body of water and subsequent water uses.

2. Solid waste

3.16 The solid waste component is subject to the following eligibility criteria:

a. The proposed solution must represent the least economic cost solution, including incremental integrated system investment, operation, and maintenance costs in present value using a 12% discount rate.

b. It must be demonstrated that the local government has the institutional and financial capability to operate and maintain the system or that it will receive the institutional strengthening necessary to develop that capability concurrently with project implementation.

F. Implementation of the institutional strengthening subproject

3.17 The program provides for the hiring of consulting firms for implementation of the various project components. The following paragraphs discuss the implementation of these components.

1. CRA institutional development

3.18 For CRA's institutional development, a contractor competitively selected for this purpose will upgrade CRA's capacity in environmental monitoring including data collection and analysis. The contractor will provide short-term staff training both on and off-site. The same contractor will be responsible for procurement, monitoring and data collection. Terms of reference for training and equipment lists have been reviewed and are acceptable to the Bank.

2. EMBASA institutional development

3.19 The contract for 270,000 meters will be for both the purchase and installation of this equipment. Procurement of these meters will take place in three bidding packages. Specifications for the meters have been reviewed and are acceptable to the Bank.

3.20 Training in maintenance and maintenance equipment will be bid as one package. Equipment lists have been reviewed and training requirements discussed with EMBASA.

G. Revolving fund for the financing of in-house connections

3.21 A revolving fund for the financing of in-house connections will be set up to help low-income beneficiaries improve their sanitary conditions by connecting their dwellings to the public sanitary sewerage system constructed using program resources. The fund will be financed with approximately US$7 million for the financing of some 75,000 service connections over the course of the five-year program execution period.

3.22 The maximum cost of connection alternatives eligible for financing would be US$250. The repayment period for customer loans would be 36 months. Monthly loan payments would appear on customer bills for water and sewerage service and must, at the very least, be indexed.

3.23 The fund would be administered by EMBASA, with a special account to be set up for management of the resources. Within six months from the effective date of the contract, EMBASA must submit, to the satisfaction of the Bank, the operating regulations of the fund. Within 12 months from the effective date of the contract, the fund must be established with appropriate resources. 20/

20/ See contractual conditions.

H. Status of land ownership and easements

3.24 In general, the proposed program should not pose any serious problems with respect to the purchase of land, since a major portion of the works in question, such as water distribution and sanitary sewerage systems, will be built along public thoroughfares. However, certain works will require the purchase of land, for which procurement is already under way.

3.25 The cost of purchasing the land is included in program costs and will be financed by the local counterpart contribution. No problems or disputes with respect to the purchase of the land necessary for program execution are anticipated, since as a last resort Brazilian law allows for the expropriation of land in cases of public utility. Nevertheless, prior to issuing calls for bids for a specific construction contract, EMBASA must submit evidence that it is in legal possession of or holds easements to the land necessary for construction. 21/

I. Program execution period, deadline for physical initiation of multiple-works projects, and investment schedule

3.26 The loan would be disbursed over a period of five years. This disbursement period was established pursuant to an in-depth study of the execution process for all program components, including bidding periods, based on past experience in implementing similar projects in Brazil. The deadline for physical initiation of multiple-works projects would be four years. 22/

3.27 The program investment schedule is outlined in the following table. Further information on this subject is available in the Region 1 technical files.

(in thousands of US$ equivalent)

YEAR	IDB-OC	IDB-OC	LOCAL	TOTAL	%
1	21,005	4,242	21,315	46,562	10.6
2	48,075	10,923	38,821	97,819	22.2
3	67,928	12,713	48,776	129,417	29.4
4	59,512	11,298	45,689	116,499	26.5
5	23,480	4,824	21,399	49,703	11.3
TOTAL	220,000	44,000	176,000	440,000	100.0
%	50.0	10.0	40.0	100.0	

21/ See contractual conditions.
22/ See contractual conditions.

J. Bidding procedure and schedule

3.28 Goods will be procured and construction contracts will be let in accordance with the procedures set forth in Annex B to the loan contract. The hiring of consulting services will be subject to the provisions of Annex C, according to which services valued at over US$200,000 are to be procured through international competitive bidding. International competitive bidding will also be mandatory for the procurement of goods in amounts over US$350,000 and construction services for over US$5 million. These thresholds are justified by the lack of international interest in competing for contracts for amounts below such thresholds established under similar projects previously conducted in Brazil. Bidding for goods and services valued at below the thresholds will be subject to domestic legislation, which requires competitive bidding and does not preclude tendering by international firms for contracts in amounts above the equivalent of US$100,000, allows closed bidding for lower amounts, and is consistent with Bank procedures.

3.29 Construction contracts and procurements of goods and services will be divided into packages as indicated in the table appearing in the Annex.

K. Previous expenses

3.30 EMBASA has submitted a request for recognition of US$3,000,000 in previous expenses for project preparation, to be recognized as local counterpart.

L. Environmental considerations

1. Environment Committee

3.31 The Bank's Environment Committee classified the program as a Category III operation at its June 22, 1993, meeting, based on its expected impact on the environment. The committee approved the program's environmental summary at its May 2, 1995, meeting.

2. Capacity of ocean outfall

3.32 To assure that the ocean outfall could be used at 100% capacity, two studies of its hydraulic and diffusion capacity were undertaken at the request of the project team over the past year. Tracers done in connection with the studies indicate excellent initial dilution and subsequent dispersion capability. The ocean outfall interior and exterior have been thoroughly examined and found to be in excellent condition. Studies assessing the outfall indicate that the risk of its failing to work properly under full load is very small.

3. Resettlement

3.33 A draft resettlement plan has been reviewed and approved by the Bank and comments have been provided to EMBASA. All 45 23/ families will be relocated in very close proximity to existing residences. In most cases, families have been interviewed and sites for relocation have been identified. The relocation will take place under EMBASA's supervision. To facilitate phasing the contractor constructing sanitary works will also undertaking the construction of new housing. The final settlement plan is a condition to adjudicating works where resettlement is required. The contract will also require evidence that the resettlement has taken place 30 days prior to initiating works.

4. Environmental impact assessment and licensing

3.34 The environmental impact assessment was made available to the public in Brazil prior to the analysis mission. Licensing of works will follow Brazilian law which requires a pre-license prior to bidding works, an installation license prior to adjudicating works and initiating construction, and an operating license before works become operational. As established under Brazilian law, CRA is responsible for issuing the necessary licenses. It is anticipated that pre-licenses for some of the works will be issued in September.

M. Program supervision and monitoring

3.35 Program execution will be supervised and monitored through the Bank's Country Office in Brazil. The executing agency will submit semiannual progress reports to the Bank. In the event that program execution is found unacceptable, the executing agency will have 60 days after receiving the Bank's recommendations in which to present the Bank with an outline of the corrective measures it intends to take and a timetable for their implementation.

3.36 Any problems that arise during program execution and the solutions implemented will be noted in the reports drawn up by the Country Office on the status of Bank loans. A summary of these matters will be included in the annual portfolio report drawn up at the beginning of each calendar year.

3.37 The results of program execution will be evaluated by the Bank within 90 days after the date of the last disbursement of the loan proceeds. A project completion report (PCR) will be prepared by the Bank through its Country Office in Brazil.

23/ An additional 51 families have opted for a cash settlement and will be reimbursed for the value of their housing.

N. Data collection and ex post evaluation

3.38 The borrower has agreed to an ex post evaluation of the program. The terms of reference and methodology for the evaluation will be submitted to the Bank within one year of the date of signature of the loan contract.

3.39 To assure that benefits can be measured, of particular importance will be the systematic collection of data on contamination levels in Salvador's 19 beaches. While some data exists on the quality of these beaches (sufficient to determine that all have coliform levels of over 5000) under the program, CRA will systematically collect this data.

IV. INSTITUTIONAL AND FINANCIAL ANALYSIS

A. The borrower and executing agency

4.1 As the borrower, the State of Bahia will be responsible for providing the local contribution. The SRHSH will be responsible for program execution and will establish an executing unit specifically for this purpose.

4.2 The executing unit, which will be the only liaison with the Bank, will coordinate the activities of the various coexecuting agencies involved, which will be: EMBASA, in charge of the water supply and sanitation subprojects and self-targeted institutional strengthening; the CRA, in charge of the industrial pollution control component, self-targeted institutional strengthening, and the environmental education component; and CONDER, responsible for the construction of physical works under the solid waste program.

4.3 The executing unit will be in charge of financial management and preparing and submitting Bank-required progress reports on program execution. As a condition precedent to the first disbursement, evidence must be submitted that the executing unit and its organizational structure have been established, the duties and responsibilities of its various sections determined, a staffing schedule devised, and the administrative and accounting department organized.

4.4 The sanitation works will be operated and maintained by EMBASA, and all works under the solid waste component will be operated and maintained by the respective municipalities.

4.5 Bank loan proceeds earmarked for the water supply and sanitation subproject will be transferred to EMBASA under financial conditions substantially similar to the conditions established by the Bank in the loan contract.

4.6 All relations between agencies involved in program execution and operation of the projects must be formalized through agreements to be approved prior to the first disbursement. For first disbursement for works in each municipality the Banks approval will be required for each agreement between the municipality and the co-executor.

B. Borrower

1. Financial position

a. Budget performance

4.7 State financial management hinges on the performance of its annual budget. The following table contains a condensed version of the budget performance statements for the period from 1992 to 1994.

State of Bahia. Budget Execution (in thousands of US$)			
	1992	1993	1994
Current revenues	2,376,742	2,575,725	2,633,705
Current expenditures	1,708,855	1,924,201	2,114,129
Current savings	667,887	651,524	519,576
Debt amortization	249,012	180,956	149,527
Surplus for investment	418,875	470,568	370,049
Capital income	160,707	38,899	61,003
Investment	692,381	590,589	509,427
Surplus (Deficit)	(112,799)	(81,122)	(78,375)

4.8 Current savings remained within an acceptable range throughout the reporting period, with large investment amounts producing minor fiscal gaps equal to approximately 3% of each year's current revenues, covered with budget funds for subsequent years.

4.9 Current state revenues for 1994, the equivalent of US$2,633,000,000 were up 11% from 1992. This growth was due mainly to larger tax revenues from the turnover tax on goods and services (ICMS), which accounted for 61% of its current revenues in 1994. Federal government transfers to the state in 1995 amounted to US$788 million or 30% of current revenues. Income from financial applications of disposable funds fell off sharply in 1994 as a result of the slowdown in inflation.

4.10 Current expenditures grew by US$406 million during the period, to the equivalent of US$2,114,000,000 for 1994, up from US$1,708,000,000 in 1992, due to increases in transfers to local governments and other agencies and in finance charges. Payroll costs and social security contributions remained relatively steady throughout 1993 and 1994, at the equivalent of US$1.15 million.

4.11 Current expenditures grew faster than current revenues, which explains why current savings, while remaining within an acceptable range, showed a downward trend. However, according to the financial projections, the state should boost its current savings over the next few years.

4.12 Current savings in 1994 were US$520 million, or 20% of current revenues. In each year of the period, current savings were sufficient to cover loan repayments and leave a large surplus of internally generated funds to finance the investment program, which amounted to US$370 million in 1994.

4.13 The state did very little new borrowing in 1993 and 1994, posting a mere US$30 million in loan capital for 1993 and US$45 million for 1994 from disbursements of a Bank loan for the highway program.

b. Debt

4.14 Despite little new borrowing by the state government, outstanding long-term debt at the close of 1994 was up sharply from previous years, to the equivalent of US$3,056,000,000. This US$850 million jump was the result of the state taking over EMBASA's debt to the Federal Savings Bank [Caixa Econômica Federal] (CEF) and the addition of corresponding unpaid accrued interest charges in the process of refinancing its domestic debt.

4.15 The state should be able to routinely service its debt in light of the following considerations: (a) the equivalent of US$1,898,000,000 (62% of the total) represents liabilities corresponding to the refinancing of state government and other agency debts whose payment period has been extended to 20 years; and (b) It includes US$448 million in state government bonds (15% of the total), most of which are rolled over at maturity.

4.16 To temper the impact of debt service, it is recommended that the proceeds of the Bank loan be transferred to EMBASA under the same financial terms and conditions as those established by the Bank in the loan contract to prevent the state government from having to increase the amount of funds earmarked for debt service.

4.17 State budget performance has been acceptable, maintaining a satisfactory level of current savings, with surplus funds available for investment financing purposes after meeting corresponding debt service obligations. Closing budget deficits represent approximately 3% of current revenues and are manageable. Outstanding debt has been refinanced with advantageous payment periods, in line with state government revenues.

2. Coexecuting agencies

a. Empresa Baiana de Águas e Saneamento, S.A. [Bahia Water and Sanitation Company] (EMBASA)

(i) Basic organization

4.18 EMBASA is a semipublic utility established for the main purpose of providing drinking water and sewerage service to the State of Bahia.

4.19 The utility's decision-making bodies are its General Shareholders' Meeting and Board of Directors, with executive authority vested in its President.

4.20 The President has the following advisory units at his disposal to assist him in the performance of his duties: a technical advisory

unit, a procurement committee, an internal auditing unit, and a corporate planning and development office.

4.21 Corporate management functions and responsibilities are divided among the following departments:

a. The administration department is in charge of the administration of human resources, procurement, and transportation services.

b. The finance department is in charge of utility business operations, financial management, and accounting. The business office is in charge of service metering and billing operations and keeping track of outstanding balances on customer accounts. This office has exhibited certain weaknesses in fulfilling its duties, failing, for example, to reconcile its records of customer accounts with the books kept by the utility's accounting staff. Accordingly, a consulting firm was hired to review the situation and establish new business procedures, aided by the procurement of more efficient data processing equipment. The new system should be operational by October 1995 at the latest. The financial management and accounting system is administered by the finance office, which is in charge of financial planning and accounting records.

c. The expansion department is in charge of planning, project preparation and the construction of water supply and sewerage systems.

d. The operations department, which is responsible for the operation of all utility systems, has set up separate offices for the Salvador metropolitan area, northern Bahia, and southern Bahia for the performance of its tasks.

4.22 This division of duties and responsibilities among the different departments allows the company to effectively fulfill its functions.

b. Staffing

4.23 In the wake of an ongoing modernization program, the utility's staff was cut by 458 employees in 1993 and 1994, or 8% of its staff as of December 31, 1992.

4.24 Its current staff consists of 5,562 employees, corresponding to 193 water service connections per employee, which is considered an acceptable ratio, compared with a ratio of 159 connections per employee as of December 31, 1992, suggesting a considerable improvement in efficiency.

4.25 The operations department has the largest personnel roster, with 2,886 employees as of December 31, 1994, or 52% of the entire staff.

c. Internal auditing

4.26 As part of the internal control system, the internal auditing office is appropriately positioned in the company's organizational structure, reporting directly to the President. The internal auditing office conducts its operations in accordance with what are considered acceptable work plans.

d. External audits

4.27 The utility's financial statements are audited by a public accounting firm. Recent auditors' reports have contained certain qualifications in regard to discrepancies in accounts receivable posted in the company's books of accounts and in business office records and the need to transfer completed construction works to fixed assets in service. It is recommended that the contract for the proposed loan include a provision requiring that the utility's annual financial statements be audited by a firm of independent public accountants acceptable to the Bank.

e. Rates

4.28 The rate-setting system for water and sanitation service was established under the 1978 National Rate-setting Act, which provides that rates must generate sufficient revenues to cover all operating costs and that utilities may obtain returns of up to 12% on their fixed capital investments. Proposed rate adjustments by utilities are subject to approval by the state governor. This system is consistent with the Bank's rate-setting policy for public utilities.

4.29 EMBASA instituted a rate adjustment program in 1993 with real increases of 4.38%, 5.60%, 4.76% and 6.11%, in October, November, and December of that year, and January of 1994, respectively. Its rates are currently frozen through June 30, 1995 in accordance with federal government policy.

3. Financial position

4.30 The following table contains a condensed version of EMBASA's balance sheets for the last three years.

EMBASA - BALANCE SHEETS (in thousands of US dollars)			
	31.12.92	31.13.93	31.12.94
ASSETS			
Fixed assets in service	365,672	337,041	463,858
Construction work in progress	139,201	175,700	308,871
Total fixed assets	504,873	512,741	772,729
Current assets	31,686	30,231	77,076
Other assets	356	168	355
Total assets	536,915	543,140	850,261
LIABILITIES AND NET WORTH			
Shareholders' equity	304,912	246,137	505,668
Long-term liabilities	114,224	214,440	167,240
Current liabilities	117,779	82,562	177,353
Total liabilities and net worth	536,915	543,140	850,261

4.31 EMBASA posted total fixed assets in the amount of US$772 million for the period ending December 31, 1994, the largest item among the assets shown on the balance sheet. These assets are undervalued, with past indexing for inflation failing to keep pace with movements in prices. Accordingly, a consulting firm has established the value of the utility's fixed assets for restatement purposes in the accounting records. The firm has submitted a preliminary report and the figures are presently being reviewed by EMBASA. The fixed assets in service are be expected to virtually triple in value, with this adjustment to be reflected in the financial statements for the period ending December 31, 1995.

4.32 EMBASA is operating the Pedra do Cavalo water supply system belonging to the Paraguaçu Valley Development Company [Companhia de Desenvolvimento do Vale do Paraguaçu] (DESENVALE), which was financed in part by the Bank, completely free of charge. This investment cost is not being recovered, since EMBASA does not include the corresponding depreciation in its operating costs.

4.33 With DESENVALE in the process of being liquidated, it was important that this asset be transferred to EMBASA. In July of 1995 a protocol of intent was signed between the State, EMBASA and DESENVALE which resolves the transfer to EMBASA of the Pedra de Cavalo Aqueduct. The Attorney General of the State has approved this protocol. The loan contract will require that the transfer of this asset to EMBASA be completed within 12 months after signature of the contract.

4.34 The main item under current assets are accounts receivable for services rendered, amounting to the equivalent of US$63.4 million for the period ending December 31, 1994, corresponding to a 116-day billing period, which is high. Payment arrears by government agencies account for approximately 20% of services, and public-sector outstanding balances represent 45% of accounts receivable, thus adversely affecting company finances. Within the balance of the delinquent accounts of the State of Bahia there was US$2,900,000 balance which was canceled in June 1995 through a processed of debt cancellation. The municipalities have pending balances for payments of US$15,200,000. It is recommended that: (a) within 12 months after signature of the loan contract, a schedule for payment of outstanding balances owed by municipalities be presented; (b) annual status reports on collections from municipalities be submitted throughout the program execution period; and (c) EMBASA be required to collect at least 85% in each year beginning in 1999 of accounts receivable.

4.35 Long-term liabilities as of December 1991 were US$181 million, including US$76.9 million owed to the Water and Sewerage Fund [Fundo de Água e Esgoto] (FAE) and US$105 million owed to the CEF, at which time the company showed debt service arrearages. Seeking to improve EMBASA's financial standing, the state government capitalized its FAE debt in 1992 and, in 1994, took over its CEF debt, which amounted to US$126 million as of December 31, 1993. EMBASA's long-term liabilities at December 31, 1994 consisted mostly of outstanding social security contributions in the amount of US$106 million, which it was given 20 years to pay off.

4.36 The high ratio of current liabilities to current assets as of December 31, 1994 is the result of accounts whose payment needs to be worked out. There is a US$50 million debt due the Social Security Administration whose refinancing is currently at the negotiation stage and a past due amount of US$43 million owed to COELBA, the power company. The debt with COELBA has been partially absorbed by the State, and a plan for payment has been establish which permits payment of the remaining debt over a period of five years. Regarding the debt with the national security institute, negotiations are being completed for refinancing of this debt. The loan contract will require that the agreement to refinance this debt be formalized in six months.

4. Income statement

4.37 The following table contains a condensed version of EMBASA's income statements for the last three fiscal years.

EMBASA - Income statements (in thousands of US dollars)			
	1992	1993	1994
Operating revenues	130,255	168,096	196,410
Operation and maintenance expenses	86,748	103,865	105,528
General and administrative	77,478	65,166	50,985
Total operating expenses	164,226	169,031	156,513
Net operating income	-33,971	-935	39,897
Other income and expenses	19,065	14,536	3,274
Net income	-14,970	13,601	43,171

4.38 In 1992, EMBASA posted a net operating loss of US$33.9 million. However, this situation reversed itself in 1993, with the income statement for 1994 reporting US$39.8 million in net operating income.

4.39 This turnaround was the result of a 60% jump in operating revenues during the period in question. Water sales for 1994 reached the equivalent of US$165.7 million, accounting for 85% of company revenues. This growth in revenues from the sale of water was produced by an increase in both the volume of water sold and the rates charged. The sales volume for 1994 was up 20% compared with 1992, from 208 million cubic meters to 252 million cubic meters, with revenues per cubic meter climbing from US$.54 in 1992 to US$.60 in 1993, and to US$.66 for 1994. These figures are averages for the year in question. Water charges were converted to reais in 1994 in the wake of the Brazilian currency conversion, with their value figured as of the due date for payment of the water bill rather than their maturity date, bringing the average charge for December of 1994 down to US$.65.

4.40 Revenues from sewerage service in 1994 were US$20.1 million, representing 10% of company revenues. These revenues have also risen as a result of larger numbers of service connections and rate increases.

4.41 Utility operating expenses have remained relatively steady as a result of cost-cutting measures implemented in 1993, such as the elimination of overtime, a downsizing of the leased vehicle fleet, and a reduction in force.

4.42 Finance charges for 1994 were negligible as a result of the state government taking over EMBASA's debt to CEF and the capitalization of its FAE debt.

4.43 A review of utility operating data shows that as of December 31, 1994, there were a total of 1,075,632 service connections to the

water supply system of which only 473,526, or 44%, were billed for water usage based on meter readings.

4.44 In the integrated Salvador system, each household with metered water service is billed for an average of 19.33 m^3, compared with an average billing of 12.17 m^3 for households without water meters, or 37% less. In other areas of the state, the average monthly billing for a metered service connection is 16.40 m^3, compared with 13.43 m^3 for nonmetered service, or 18% less.

4.45 These operating statistics illustrate the importance, from a financial standpoint, of instituting a program to improve coverage rates for metered service.

4.46 A review of the EMBASA's financial statements shows a sizeable improvement in the results of its operations, along with an effort on the part of the state government to strengthen the utility's financial situation by capitalizing its FAE debt and taking over its CEF debt. There are still a number of issues which need to be resolved, such as agreeing on a payment plan for its debts to the social security system and COELBA. EMBASA also needs to improve collection rates for services rendered and coverage rates for metered service. A number of recommendations have been formulated to address these issues.

5. Centro de Recursos Ambientais [Environmental Resource Center] (CRA)

4.47 The State Environmental Resource Management System [Sistema Estadual de Administração de Recursos Ambientais] (SEARA), is composed of the Executive Secretariat of the State Council on the Environment [Secretaria Executiva do Conselho Estadual do Meio Ambiente] (CEPRAN), the Executive Secretariat of the State Council on the Environment, a deliberative body, and the CRA, an executive body.

4.48 The CRA is a decentralized agency attached to the Department of Planning, Science, and Technology with full legal capacity and administrative and financial autonomy. It is the executive body for SEARA, operating in tandem with its deliberative body, the CEPRAN.

4.49 The law of October 1992 redefined the types of operations to be conducted by the CRA, which include: (a) identifying activities with an impact on the environment and setting standards for oversight purposes; and (b) issuing opinions with respect to the granting of licenses for the location, construction, operation, and expansion of projects with a definite or potential impact on the environment and for corresponding changes in procedures and equipment based on analyses of projects and engineering reports.

4.50 CRA operations are managed by its Director General, backed by an organizational structure deemed adequate to assist him in the

performance of his duties, consisting of the following departments: (a) an environmental impact evaluation, and control department, handling all matters pertaining to the licensing of projects and investments; (b) an environmental development department, in charge of regularly monitoring natural resource quality and the progress of environmental projects and of identifying and mapping out natural resources; and (c) an administration and finance department, in charge of administering the agency's financial and human resources.

4.51 CRA budget performance data for 1994 shows a total of US$2 million in funding, including US$1.7 million provided by the state. In addition, the CRA earned US$790,000 for services rendered, bringing total revenues to US$2.9 million from a mere US$1.7 million in 1992, for a 70% surge in revenues over a two-year period.

4.52 The CRA also increased the size of its staff from 139 to 151 employees over this same period. Its higher revenues and staffing are a reflection of the priority assigned to the CRA by the state government.

4.53 The institutional structure of the CRA will be revamped and strengthened as part of the proposed program. The CRA will undertake no financial commitments with respect to the local contribution or debt servicing in connection with the program.

6. Companhia de Desenvolvimento da Região Metropolitana de Salvador [Salvador Metropolitan Area Development Company] (CONDER)

4.54 CONDER is a legally established private enterprise with its own capital and administrative and financial autonomy, linked to the government through the Department of Planning, Science, and Technology. Its purpose is to coordinate and implement development policy in metropolitan Salvador and its area of influence.

4.55 CONDER undertakes no financial obligations whatsoever under the proposed program, acting solely as coexecuting agency for the solid waste collection and final disposal component. It has extensive experience in this area, having implemented a comparable World Bank project for a group of municipalities in the Salvador area at a total cost of US$70 million.

4.56 The physical works to be constructed under the solid waste component will be operated and maintained by the five recipient municipalities (Santa Amaro, Cachoeira, São Félix, Muritiba, and Maragojipe).

4.57 All five municipalities have a unit in charge of the collection and disposal of solid waste in their organizational structure.

4.58 Annual operating costs for the sanitary landfills to be constructed under the program are minor, representing a fraction of annual

municipal income. Accordingly, the efficient operation of the sanitary landfills will depend on the priority assigned to this endeavor by each municipality. This issue needs to be addressed in the agreement to be entered into by the municipality, CONDER, and the program executing unit.

V. PROGRAM FEASIBILITY

A. The program's technical approach

1. General

5.1 The program's approach proposes the use of an existing ocean outfall now operating at 12% capacity for the Salvador sewerage system, a series of measures to ensure an 80% connection rate to the new system, and elimination of all of the sewerage discharge points on Salvador's 19 beaches. For sewerage systems outside of Salvador, which represent only 10% of the program's costs, designs will be based on minimal cost solutions. Use of the existing ocean outfall for the Salvador system is by far the most cost effective technical alternative for this first phase. Other alternatives were explored and found to cost a minimum of 20% more.

2. Mathematical model

5.2 The technical approach for the first phase is to finance the very highest priority minimal costs investments and develop a mathematical model as part of the program. With such low coverage rates, there was no need to use a mathematical model to identify priority first phase works. For the second phase, however, a model is viewed as critical to making decisions regarding levels of treatment, location of treatment plants, other expansion of the network, and areas of emphasis in controlling industrial pollution.

3. Ocean outfall

5.3 A series of studies were conducted to ensure that the approach based on the use of the existing ocean outfall is environmentally sound.

5.4 The first step was a visual inspection of the ocean outfall, filming it inside and outside to check its state of repair. The structural condition of the outfall was deemed satisfactory, with the interior showing very little sedimentation from sand deposits, which was expected to be greater in light of its low flow rates.

5.5 The hydraulic capacity of the outfall was also checked for impairment due to surface roughness associated with the condition of the interior pipe walls. The capacity of the outfall is roughly 9.5 m^3/s, making it unnecessary to raise the height of the surge tank.

5.6 Lastly, on-site measurements of dilution conditions around the outfall were taken using fluorescent tracers under flood tide and ebb tide conditions. In order to ensure adequate dilution conditions at the low flow rates at which the outfall is presently operating, a number of diffuser apertures have been closed and will

be reopened as flows through the outfall increase. Accordingly, the test performed is also representative of future dilution conditions. The test results show initial dilution at the surface as 1:200 and as 1:10,000 at a distance of 200 meters from the point at the surface above the diffusers. These values, considered together with the fact that currents run parallel to the coast, indicate that it is highly unlikely that pollutant levels at beaches in the proximity of the outfall will exceed established standards for waters classified as safe for bathing.

5.7 The cost differential between the least-cost solution chosen for expanding Salvador's sanitary sewerage system using the existing ocean outfall at full capacity and the alternative providing for a series of treatment plants, including advanced or tertiary treatment, is roughly US$47 million.

5.8 Should larger flows through the existing outfall produce a detectable rise in pollutant levels at nearby beaches attributable to the outfall, despite the fact that all measurements and computations performed to date indicate that the existing outfall has the necessary dilution capacity to ensure that adjacent beaches will not be adversely affected in any way, there is always the option of increasing the level of sewage treatment provided at the outfall pretreatment plant. In no event would the cost of this more advanced treatment exceed the cost differential between the two alternatives considered.

B. Technical feasibility

5.9 The program is technically feasible because:

a. The program responds to the urgent need to expand and improve the sanitary and environmental infrastructure of Salvador and the Todos os Santos Bay area. It reflects the high priority given to environmental sanitation by Brazil's Federal Government and the State of Bahia.

b. The preliminary engineering designs (desenhos básicos) for Sewage collection and treatment for Salvador have been reviewed and have been used as basis for cost estimates for the Salvador system. For sewerage systems in adjoining municipalities preliminary designs for Simões Filho and Candeias have been used as a basis for cost estimates.

c. For potable water supply, cost estimates are based on a sample of preliminary designs from an integrated system designed for Simões Filho and Candeias, and Madre de Deus, and a second system for Maragojipe. For water meters, cost estimates are based on prices of the same equipment purchased over the past several months.

d. With a newly established unit in EMBASA for house connections and a loan program for in-house connections, an 80% connection rate to the new sewerage system is viewed as feasible.

e. The approach to utilize the outocean outfall as a least cost alternative for sewerage collection and treatment in Salvador is environmentally sound.

f Cost estimates for sanitary landfills are based on similar works recently bid and financed by the World Bank in the Salvador area.

g. The program for industrial pollution control has been discussed in considerable detail with major polluting industries who have agreed to substantially reduce contaminants.

h The cost of the program has been calculated based on real unit costs on the international and Brazil domestic markets. Reasonable provision has been made for contingencies and escalation.

i. The grouping of bids for goods, works, and services will encourage sufficient national and international competition.

j. The program's co-executors have the necessary technical personnel and adequate financial resources for execution of the program's components.

C. Institutional feasibility

5.10 The responsibility for program execution will be lie with an executing unit operating in the Secretary of Water Resources, Sanitation, and Housing. The unit's proposed structure is acceptable and includes a technical department with staffing tailored to the various program components and active involvement of coexecuting agency experts.

5.11 The technical unit will coordinate the operations of project coexecuting agencies in charge of conducting competitive bidding procedures and supervising the construction of physical works.

5.12 Of the coexecuting agencies involved, both EMBASA and CONDER have extensive construction experience and the administration and accounting systems necessary to properly manage program resources.

5.13 The executing unit will also include an administrative and accounting department in charge of administrative procedures and of collecting program financial performance data prepared by the coexecuting agencies for purposes of maintaining program accounting records.

5.14 To assist it in fulfilling its functions, the executing unit plans to hire consultants to resolve any specific problems that may arise during program execution.

5.15 EMBASA will operate and maintain all the sanitation works and has the institutional and financial capacity to do so.

D. Financial feasibility

5.16 The financial projection was developed for the State of Bahia to assess the ability of the state government to finance the local project contribution. The projections are summarized in the following table.

State of Bahia: Financial projections
(in millions of US dollars)

	1995	1996	1997	1998	1999	2000
Current revenues	2,671	2,760	2,853	2,948	3,047	3,149
Current expenses	2,243	2,289	2,340	2,391	2,433	2,476
Current savings	428	471	513	557	614	673
Debt amortization	105	102	112	126	141	152
Surplus for investment	323	369	401	431	473	521
Capital income	93	104	102	95	77	34
Investment commitments	190	215	215	205	192	125
Available investment funds	226	256	298	321	358	430

5.17 The projections show that the State of Bahia will have adequate current savings in each year of the projection period to cover repayments of outstanding debts. The remainder, plus capital income, comprised of proceeds from loans approved or under negotiation for the financing of physical works, is sufficient to fund programs involving an investment commitment (the Bank-financed highway program, PRODETUR, and the proposed project).

5.18 After covering these expenses, the projections still show a surplus for investment, amounting to the equivalent of US$226 million for 1995 and gradually increasing to US$430 million by the year 2000.

5.19 Accordingly, the state government would have the capacity to finance the local contribution to the proposed project and still have surplus funds to invest in other works. The projections show the state would have an annual investment capacity equal to US$416 million in 1995 and US$568 million in the year 2000, which figures are consistent with historical data.

5.20 It will be EMBASA's responsibility to service the largest share of the debt with the Bank.

5.21 Projected performance shows a 20% increase in the volume of water billed, from 264 million cubic meters in 1995 to 318 million cubic meters by the year 2004, as a combined result of the larger number of service connections, system expansion under various programs implemented during the projection period, and the expected impact of the meter installation program. The projections also show the expected effect of the proposed project on billings for sewerage service, with service volume virtually tripling over the period from 1995 to the year 2004.

5.22 The larger volume of projected water sales and sewerage service should increase operating revenues from US$195 million in 1995 to US$268 million by the year 2004.

5.23 A review of projected operating expenses shows the growing importance of depreciation among costs in the wake of the revaluation of EMBASA's fixed assets and its takeover of the Pedra do Cavalo project and other projects financed by the IDB and the World Bank, depreciation representing 29% of operating expenses in the year 2000, compared with 6% in 1994.

5.24 There are swings in the results of utility operations during the projection period, with operating losses projected for 1996 and 1997 and profits projected for all years thereafter. However, the losses as well as subsequent profits are minor. It should be noted that projected depreciation may need to be adjusted as soon as EMBASA completes its review of the study conducted for revaluation of its assets and in light of the final valuation of the Pedra do Cavalo project, to be performed.

5.25 Internal cash generation increases each year during the projection period as a result of the growing magnitude of depreciation as a share of operating expenses and, according to the projections, should climb from US$43 million in 1995 to US$83 million by the year 2004.

5.26 Internal cash generation is sufficient to meet debt service requirements each year. It should be noted that during the program execution period debt service arising from the refinancing of EMBASA's debts to social security agencies and the Bahia Power Company [Companhia de Eletricidade de Bahia] (COELBA) represents a major financial burden.

5.27 EMBASA will have a small surplus of funds for additional investments in IDB and World Bank programs over the period from 1995 through 1998, with the projections showing an accrued surplus of only US$21 million for other investments at the close of 1999. The utility should begin to post surpluses beginning in the year 1999 in which the debt service coverage ratio is 1.4, amounting to US$47 million in that particular year and varying thereafter from a

low of US$27 million in the year 2001 to a high of US$55 million in the year 2004.

5.28 Thus, according to the financial projections, EMBASA's ability to make additional investments will be somewhat weakened over the period from 1995 to 1999 with water and sewerage rates remaining at their present level, with this situation improving as of 1999, but it should have no problems servicing its debts, even with the proposed loan.

5.29 To ensure that utility revenues remain adequate, it is recommended that the loan contract require revenues from customer billings at rates charged by the company to be sufficient to cover all operating costs, including operation, maintenance, administration, and depreciation of its revalued fixed assets. If the application of the above does not generate sufficient revenues to cover all the obligations of the utility and finance a portion of the expansion program, EMBASA and the borrower must take the necessary measures, which may include rate increases to achieve that purpose.

5.30 The annex to the loan contract will include a provision to the effect that 30% of the expansion program must be financed by net internal cash generation beginning January of 1998. This requirement does not apply either to the proposed project or to the modernization project financed by the World Bank since, in both cases, the local contribution will be provided by the state.

E. Socioeconomic analysis

1. Salvador sanitary sewerage project

5.31 The configuration of the proposed Salvador sanitary sewerage system for which Bank financing is being solicited is the product of a review and update of the master plan drawn up in 1993. In essence, the master plan considered two different system configurations. The first alternative, in short, called for the collection, treatment, and local disposal of sewage following the area's natural watersheds. The second alternative was to pump the sewage through the existing outfall using it at full capacity until the year 2013, at which point it would be necessary to build another outfall. The latter alternative was selected and represents the least-cost solution. A study was also conducted to optimize the ratio between the depth of the sewer mains and the distance between effluent pumping stations. For this phase of the program main sewer systems will be constructed to serve the most densely populated areas of the municipality lying principally along the coast. Most of the urban developments not included in the program have their own EMBASA-operated sewage collection and treatment systems.

5.32 The proposed main sewer systems all represent least-cost solutions in that they are generally dictated by the area's physical features, by the layout of streets and roads, and by the minimum required pipe diameter. They were all designed using appropriate

mathematical system optimization models (considering diameter, depth, distance between manholes, etc.). Moreover, unconventional (condominial-type) 24/ sewerage systems, which have proven to be less costly than traditional solutions, are envisioned for residential districts in hilly areas that are difficult to access.

5.33 The socioeconomic evaluation took into account as public as well as customer investment costs and incremental administrative, operating, and maintenance costs. These values, budgeted at market prices, were converted into efficiency prices to reflect the opportunity cost of the various inputs to be used for project execution.

5.34 The expected benefits of project execution would be as the public's willingness to pay (WTP) for adequate sewage collection and disposal services and the cleanup of Salvador's beaches, both on the bay and on the ocean side. This latter benefit would be achieved through the construction of all the proposed works. The public's WTP for both benefits was measured based on the contingent valuation method.

5.35 The cost-benefit analysis yielded a project economic rate of return of 16.8%, assuming that 80% of the service connections planned are executed by the end of the project implementation period. The sensitivity analysis showed that the project is quite sound, allowing cost overruns of as much as 33% or a reduction of up to 25% in expected benefits and allowing a time period delay of two years to reach an 80% connection rate. Project costs are unlikely to vary that much, since they were based on preliminary engineering designs and unit costs from recently held bidding procedures. Moreover, measures have been taken to avert problems encountered in the past during the installation of sewerage systems in other parts of the municipality, associated primarily with lags in service connections. These measures include the establishment of a revolving fund to finance in-house connections, concurrent execution of a health and environmental education component, and setup of a special unit for the detection of unauthorized connections to the sewerage systems.

5.36 Further tests show an economic rate of return of over 12% for each subsystem included in the project, which is the minimum return required by the Bank. The following table shows the rates of return for the Salvador subsystems and variations in project costs and benefits necessary to lower the economic internal rate of return (EIRR) to under 12%.

24/ The utility company helps organize the community into condominial associations (generally by block) and the systems are built on customer-owned land. System maintenance is ensured jointly by the users and the utility company.

Cost-benefit analysis: Salvador subsystems
(present value, in millions of US dollars)

Subsystem	Total cost	Benefit		EIRR (%) (base)	Sensitivity (%) a/	
		Total	Net		Cost	Benefit
Salvador b/	204.5	271.1	66.6	16.7	+33	-25
- Suburbio	51.2	64.2	13.0	15.9	+30	-20
- Camarojibe	55.6	98.7	43.1	21.7	+90	-43
- Comercio	32.6	37.7	4.7	14.2	+17	-12
- Pituaçu	20.2	29.4	9.2	17.8	+50	-30
- Jaguaribe	39.4	41.5	2.1	12.8	+6	-5

a/ Percentage increase in costs and decrease in benefits bringing the project rate of return under 12%.
b/ Includes the cost of expanding the pretreatment plant.

2. Multiple-works projects for other project area municipalities

a. Sanitary sewerage projects

5.37 The sanitary sewerage projects comprising the program sample provide for the construction of main sewer systems and interceptors, sewage treatment, and final disposal. This phase of the program targets the most densely populated areas for construction of the systems. Condominial-type sewerage systems are planned for system construction in communities in hilly areas or with asymmetric development patterns, as in the case of Salvador. The proposed treatment system represents the minimum required level of treatment and the least-cost alternative.

5.38 Project evaluation considered all project-related costs (EMBASA and user investment costs and incremental operating and maintenance costs). Expected benefits from project execution were measured by the public's WTP for sewerage service, which was computed using the contingent valuation method. Population projections were based on census and land use data.

5.39 The estimated economic internal rates of return for the Candeias and Simões Filho projects were 18.8% and 12.2% respectively. The sensitivity analysis showed that the Candeias project is quite sound, allowing cost overruns of as much as 40% or reductions in project benefits of up to 23%. The rate of return for the Simões Filho project, however, is just above the minimum 12% rate required by the Bank, allowing little variation in costs or benefits. The measures described in paragraph 5.35 above have been taken to mitigate project risks, in addition to which the Simões Filho project is in the process of being revised by the prospective executing agency in an attempt to further reduce costs and optimize the proposed system. The other projects submitted to the Bank were found unacceptable and will need to be reformulated based on least-cost solutions and phased implementation.

b. Water supply projects

5.40 The goal of the investments called for in the sample water supply projects is to optimize and expand the coverage of the Maragojipe systems and the Integrated Reconcavo System serving the municipalities of Candeias, São Francisco do Conde, and Madre de Deus. Most of these investments were to be made in the second phase of the projects in question, which were launched some 10 years ago, and represent the least-cost solutions.

5.41 The costs considered in the evaluation include investment costs and fixed and variable incremental operation and maintenance costs, valued at efficiency prices. The bases and elasticities used were produced by a socioeconomic survey. Project economic rates of return were computed using the SIMOP model, yielding a 19.8% rate of return for Maragojipe and a 57.2% return for the integrated Reconcavo system. Implementation of both projects is highly desirable since only in the highly unlikely event of cost overruns in the area of 65% and 300%, respectively, or of 7% and 73% reductions in benefits for the Maragojipe and integrated Reconcavo systems, would project returns fall below the minimum rate required by the Bank. Since the integrated Itaparica/Vera Cruz system project was not found to be technically, economically, and environmentally feasible, it was not included in the sample, and will require extensive modifications, particularly as regards the expansion plan for the water supply and distribution system.

5.42 The household metering component calls for the installation of 270,000 meters in the various water supply systems operated by EMBASA in the State of Bahia. In making these investments, the utility is seeking to expand the coverage rate for metered water service to approximately 66%. The main objectives of this component are to: (a) prevent users from wasting water and postpone investments to expand existing systems; and (b) increase utility revenues.

5.43 Computations of the economic rate of return for this component were based on the assumption that, in most cases, available water could be distributed to new customers through metered service connections. The cost-benefit analysis considered investment, as well as meter operation and maintenance costs, with the expected benefit measured by the opportunity cost of water, conservatively estimated at R$0.57/$m^3$. The rate of return for this component would be 24.6% for a five-year service life. Its high economic rate of return aside, this program component is also desirable due to its positive impact on utility finances. Even with a 35% cost overrun or a 25% reduction in the volume of water consumption, its rate of return would still be over 12%.

c. Solid waste projects

5.44 As there were no preliminary engineering designs available for the sample of solid waste projects, project analysis was based on the

master plans prepared by CONDER for the five program municipalities and an evaluation of the World Bank-financed Camaçari/Dias D'Avila project currently under way, which is similar to the projects under the proposed program. The proposed projects represent a comprehensive solid waste management system, ranging from street sweeping to the collection of residential, commercial, industrial, and hospital waste and its transportation to sanitary landfills for final disposal. The projects also seek to minimize collection costs by optimizing routing and attaining certain efficiency targets in street sweeping. There is also an institutional strengthening component for the municipalities in charge of operating these systems. The borrower has agreed to provide the Bank with two comprehensive solid waste projects for review and approval.

d. Eligibility criteria for other projects under the program

5.45 In order for a project to be included in the program, evidence must be submitted that the proposed solution represents the least-cost alternative, and the project must have an economic rate of return of at least 12%.

3. Ability to pay

5.46 According to available socioeconomic data, the public should have no problem paying EMBASA's R$5.00 minimum monthly water and sewerage charge. In addition, EMBASA offers a special rate to low-income customers meeting specific utility-established eligibility requirements. 25/ The monthly service charge for this class of customers is under R$1.00, with close to 60.000 households throughout the state currently qualifying for the special rate. EMBASA is in the process of updating its registry of low-income households.

5.47 EMBASA will need to adjust its present tariff structure to take into account long-term marginal costs. It has World Bank funds to conduct the necessary rate-setting studies.

4. Poverty targeting

5.48 The project area lies in northeastern Brazil, which is the poorest region of the country. According to survey data from December 1994, 61.9% of the program's target population would be classified as low-income households 26/. Accordingly, with over half its recipients qualifying as low-income households, the project meets Bank-established poverty-targeting criteria.

25/ Dwellings with a built-up area of 20 cubic meters or less, displaying four of the following features: a cement or poor quality floor, a single sanitary core, a single water faucet or a single electric light fixture (bulb).

26/ Populations with incomes of up to R$91.00 per capita/month.

SANITATION PROGRAM FOR PROCUREMENT SCHEDULE
SALVADOR AND TODOS OS SANTOS BAY

MAJOR PROJECT PROCUREMENT	Number of bidding packages	Financing (%)		Method	Prequalification (yes/no)	Tentative EIA publication date
		IDB	Local			Semester/year
A. Procurement of goods						
1. Pipe and valves US$16 million	2	60		ICB	Yes	11/96 and I/97
2. Machinery and equip. US$10 million	2	60		ICB	Yes	II/96 and I/97
3. Household meters US$18.4 million	3	60		ICB	Yes	II/96 and I/97
4. Misc. equipment US$3.2 million	3	60		CB	Yes	II/96 and I/97
B. Civil works & installation						
Salvador						
1. Trunk sewers and outfalls US$24.6 million	3	60	40	ICB	Yes	II/96
2. Pumping stations US$20 million	3	60	40	ICB	Yes	II/96
3. Main sewer system & service connections US$81.2 million	10	60	40	ICB	Yes	II/96
4. Expansion of the pre-treatment plant US$5 million	1	60	40	ICB	Yes	II/96
Todos os Santos Bay area cities						
5. Water supply: São Fco. do Conde and Candeias US$2.4 million	1	60	40	CB	Yes	II/96
6. Water supply: Maragojipe US$1 million	1	60	40	CB	Yes	II/96
7. Sewerage: Simões Filho and Candeias US$11 million	2	60	40	ICB	Yes	II/96
8. Water supply and sewerage: other cities US$46.6 million	8	60	40	ICB*	Yes	II/96
9. Solid waste: other cities US$9 million	2	50	50	CB	Yes	II/96
C. Consulting services						
1. Supervising firm US$13.2 million	1	100	-	ICB	Yes	II/95
2. Staff training US$2 million	1	10	90	ICB	Yes	II/96
3. Studies and designs US$5 million	10	-	100	CB	Yes	I/96
4. Mathematical model/ Todos os Santos Bay US$1 million	1	100	-	ICB	Yes	II/96
5. Supporting consulting services for the executing unit	10	100	-	ICB	Yes	II/95

ICB - International competitive bidding
CB - Competitive bidding
* - ICB or CB, depending on the amount involved for each city.

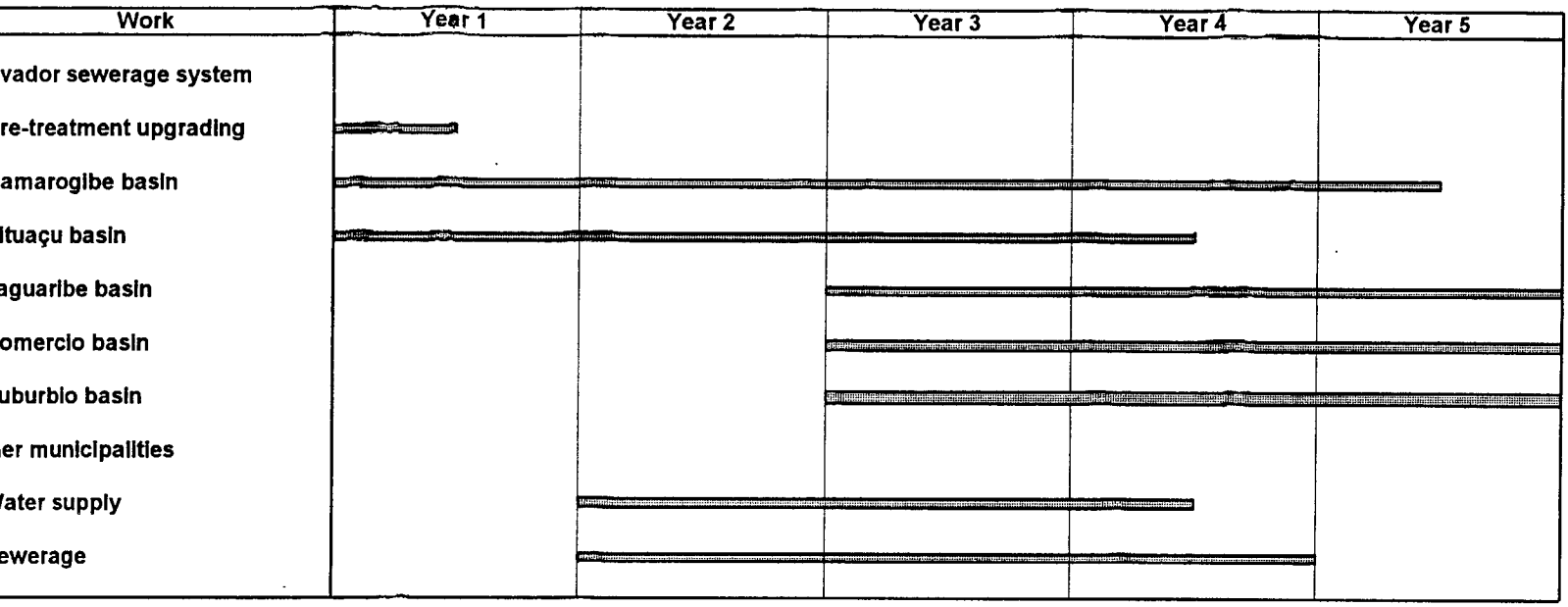
BENCHMARKS FOR ELIMINATING CONNECTIONS TO THE DRAINAGE SYSTEM

% ELIMINATED

YEAR	PERCENTAGE
1	10
2	25
3	50
4	80
5	> 90

ENVIRONMENTAL SANITATION PROGRAMFOR SALVADOR AND THE MUNICIPALITIES OF TODOS OS SANTOS BAY

WORKS SCHEDULE



PROPOSED RESOLUTION

BRAZIL. LOAN /OC-BR. TO THE STATE OF BAHIA
Environmental Sanitation Program for
Salvador and the Municipalities
of Todos os Santos Bay

The Board of Executive Directors

RESOLVES:

That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, to enter into such contract or contracts as may be necessary with the State of Bahia, of Brazil, as Borrower, and the Federative Republic of Brazil, as Guarantor, for the purpose of granting the former a financing to cooperate in the execution of the Environment Sanitation Program for Salvador and the Municipalities of Todos os Santos Bay. Such financing will be for the amount of up to two hundred and sixty four million dollars of the United States of America (US$264,000,000), which are part of the Ordinary Capital resources of the Bank. The amount of the financing shall be disbursed as follows: (a) up to two hundred and fifty four million dollars (US$254,000,000) or the equivalent thereof in other currencies which are part of the Ordinary Capital of the Bank, except that of the Federal Republic of Brazil; and (b) up to ten million dollars (US$10,000,000) in local currency of the Federative Republic of Brazil. This loan shall be subject to the "Special Contractual Conditions" and the "Terms and Financial Conditions" of the Executive Summary of the Loan Proposal.