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DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D.C. 20523

CAPITAL ASSISTANCE PAPER

Proposal and Recommendations
For the Review of the
Development Loan Committee

USGS

BRAZIL - MINERAL AND WATER RESOURCES PROGRAM

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DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D.C. 20523

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AID-DLC/P-553
May 5, 1967

MEMORANDUM FOR THE DEVELOPMENT LOAN COMMITTEE

SUBJECT: Brazil - Mineral and Water Resources Program

Attached for your review are the recommendations for authorization of a loan in an amount not to exceed $9,200,000 to the Government of Brazil to assist in financing (1) surveys of mineral and water resources by the National Department of Mineral Production (DNPM) and the National Department of Water and Energy (DNAE), (2) technical assistance to the DNPM and DNAE, and (3) equipment for the DNPM and DNAE ("Program").

This loan proposal is scheduled for consideration by the Development Loan Staff Committee at a meeting on Thursday, May 11, 1967.

Rachel C. Rogers
Assistant Secretary
Development Loan Committee

Attachments:
Summary and Recommendations
Project Analysis
ANNEXES I-III

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May 5, 1967

Technical Assistance Loan

BRAZIL - MINERAL AND WATER RESOURCES PROGRAM

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May 5, 1967

BRAZIL - MINERAL AND WATER RESOURCES PROGRAM

SUMMARY AND RECOMMENDATIONS

1. APPLICANT: The applicant is the Ministry of Mines and Energy on behalf of its two departments, the Departamento Nacional da Producao Mineral (DNPM) and the Departamento Nacional de Aguas e Energia (DNAE). The GOB will be the borrower.

2. AMOUNT: Not to exceed $8,400,000* to cover the foreign exchange costs of commodities and services of U.S. source and origin, including the services of U.S. technicians, GOB participant training in the U.S.A. and procurement of scientific equipment from the U.S.A., and to cover the local currency costs of locally manufactured equipment, special contractual services for aerial photography, helicopter services, base map compilation.

3. TOTAL COST: The total cost of the proposed program is $20,167,000 including GOB direct funding of cruzeiros for salaries, operational costs, installations, maintenance, etc. GOB direct funding will be provided from federal revenues. The relative contributions to financing the project are as follows:

*The cost is estimated to be $8,306,000, but the loan amount has been rounded to $8,400,000.

Summary of Costs

Project	AID	GOB Contribution (in $ equiv)*
DNPM-1 Bahia Project	$3,323,000	$ 3,799,000
DNPM-2 Central Brazil Project	783,000	633,000
DNPM-3 Tungsten Project	393,000	237,000
DNPM-4 Phosphate Project	322,000	312,000
DNPM-5 Ground Water Project	308,000	1,384,000
Sub-Totals	5,129,000	6,365,000
DNAE-1 Hydrologic Data Collection	1,565,000	4,009,000
DNAE-2 Photogrammetry Project	1,430,000	909,000
DNAE-3 Combined Tariffs, Licenses, Statistical and Administrative Services	182,000	578,000
Sub-Totals	3,177,000	5,496,000
TOTALS:	$8,306,000	$11,861,000
TOTAL PROGRAM FUNDING:		$20,167,000

(To assure proper accountability, a detailed break down of the Borrower's contribution for the first year of the Program will be approved as a condition precedent to first disbursement. In view of the nature of the Program, it must be recognized that specific funding allocations for individual projects and activities may need adjustment from time to time on the basis of field experience. As the Program proceeds, adjustments in work plans and related revisions of cost allocations will be agreed upon among USAID, GOB and USGS either at "annual Program reviews" (described in Section VI of this paper) or as the need arises at other times during the year. Adjustments in dollar requirements for U.S. goods and services will be within the overall loan limit for such goods and services, i.e. within $6,015,000).

4. THE PROGRAM: Projects to be undertaken under this program are (1) technical and capital assistance and surveys in connection with the GOB Ten-Year Master Plan for Mineral Evaluation of Brazil, for the DNPM, and (2) technical and capital assistance in connection with hydrologic data compilation and planning for water resources for the DNAE. Institutional development, training of technical and scientific personnel, geologic mapping and assistance in mineral and water resources appraisal and development are specific objectives of this program.

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* At CR$2,200:$1 Rate used throughout paper.

5. BACKGROUND: Cooperative program between the GOB and USGS for the study of Brazil's mineral resources date from 1940, and in the field of hydrology from 1962. Heretofore, technical assistance in these sectors has been extended on a grant basis. It is proposed herein that beginning July 1, 1967 such assistance be continued but on the basis of a loan from A.I.D. to the GOB.

6. PURPOSE: The purpose of the proposed loan is to assist the Brazilian government 1) in the strengthening of the DNPM and DNAE as agencies carrying out programs of natural resource evaluation, planning and regulation, and 2) in implementing certain projects of mineral and water resource evaluation and data collection.

7. VIEWS OF THE MISSION: The Mission recommends approval of the loan.

8. COUNTRY CLEARANCE: COCAP has concurred in the loan request.

9. OTHER FREE WORLD FINANCING: The Export-Import Bank, the Inter-American Development Bank and the International Bank for Reconstruction and Development are not interested in financing this Program.

10. RECOMMENDATIONS: It is recommended that a loan not to exceed $8,306,000 to the Government of Brazil be authorized subject to the following terms and conditions:

(a) Borrower shall repay the loan to A.I.D. within forty years from the first disbursement under the loan, including a grace period of not to exceed ten years. Borrower shall pay to A.I.D. in United States dollars on the disbursed balance of the loan interest at the rate of one (1) percent per annum during the grace period and two and one half (2-1/2) percent per annum therearter.

(b) As conditions precedent to the first disbursement of the loan Borrower shall submit to AID for approval:

(1) a detailed breakdown of the financial contribution which Borrower shall make to the Program; and

(2) a detailed work plan for the Program for the first year of operation.

(c) Borrower shall use for the Program, in lieu of any United States Dollars that would otherwise be disbursed under the loan to finance the Brazilian currency costs of this Program, any currencies that may become available to Borrower after the date of the loan agreement in connection with assistance (other than the loan) provided by the United States of America to Borrower, provided that currencies may be used for such purpose.

Project Committee: Loan Officer: CSBell, USAID/Brazil
Engineers : MWhite, ADavis, USAID/Brazil
Lawyers : JHeller, USAID/Brazil; DCameron, AID/W

Drafting Officers: MWhite, ADavis, NBillig, CSBell

MINERAL AND WATER RESOURCES
PROGRAM BUDGET
(In Thousands)

1. AID Dollar Disbursements LOAN	FY 1968	FY 1969	FY 1970	FY 1971	FY 1972	TOTALS
U.S. technicians under PASA* (72.5 man years)	570 (22) m.y.	624 (24) m.y.	388 (15) m.y.	260 (10) m.y.	39 (1.5) m.y.	1,881
International travel & transp. of HHE, U.S. technicians	113	110	75	45	10	353
USGS and USBM Tech/Admin. Support (Lab services, report/map prep. publication, TDY spec.)	188	207	122	97	18	637
Participant Training in the USA (In-service & academic) Includes per diem and international tvl., tuition, books, other costs. (1,376 man months)	220 (308) m.m.	354 (487) m.m.	275 (385) m.m.	211 (162) m.m.	69 (64) m.m.	1,129
Commodities (Specialized, scientific for field & laboratory operations)	717	502	500	215	86	2,020
Sub-Totals:	1,808	1,797	1,360	828	222	6,015
2. Cruzeiro Costs in Dollar Equiv. LOAN						
Commodities (local procurement for field vehicles, field equipment, lab. equipment & supplies in support of operations)		390	325	255	100	1,070
Other Costs (contract services for aerial photography, helicopter services, base map compilation & reproduction services, etc.		421	400	400	-	1,221
Sub-Totals		811	725	655	100	2,291
Total Loan Funding:	1,808	2,608	2,085	1,483	322	8,306

*Under the PASA, AID will reimburse the Department of Interior in dollars for full personnel costs including allowances.

MINERAL AND WATER RESOURCES
PROGRAM BUDGET
(In Thousands)

(Continued)	FY 1968	FY 1969	FY 1970	FY 1971	FY 1972	TOTALS
3. GOB Direct Funding (Cruzeiro costs in dollar equiv.)						
Salaries, Personnel Benefits, etc.	1,341	1,432	1,054	1,033	627	5,487
All other expenses for field, office, & laboratory operations	2,218	1,442	1,056	1,031	627	5,509
Total GOB Direct Funding	3,559	2,874	2,110	2,064	1,254	10,996
Total Program Funding						20,167

SECTION I - PLACE OF THE LOAN IN THE PROGRAM

A. Role in the A.I.D. Program

In the fall of 1965, when the annual "Country Assistance Program," document was submitted by USAID/Brazil, the Mission proposed to continue grant technical assistance in the mineral and water resources area for several additional years. In the Washington program review which followed, it was decided that because of decreasing fund availabilities, some technical assistance activities would have to be curtailed, discontinued or shifted to loan financing. The natural resource area, which offers promise of increased Brazilian export earnings, was deemed to be appropriate for loan financing. The USAID then informed the Brazilian Government that beyond July 1, 1967, assistance for natural resources could not be continued on a grant basis but that a loan proposal would be given consideration. The Government formally requested loan assistance in the fall of 1966 and a program for mineral and water surveys, technical assistance and equipment procurement was drawn up in consultation with the USAID.

A.I.D. and the GOB believe that the technical assistance projects in minerals resource surveys and hydrologic data collection should run for periods ranging from two to five years depending on the specific fields. It is the judgment of both that to assure that technical and administrative capabilities of the Brazilian governmental institutions to be assisted (the Departamento Nacional de Producao Mineral -- DNPM -- and the Departamento Nacional de Aguas e Energia -- DNAE -- of the Ministry of Mines and Energy) are adequate to carry out their programs effectively, without further external help, programs of such a duration are required. During the course of the technical assistance effort, important natural resource surveys and hydrologic data collection programs will be carried out by Brazilian Government technicians with the advice and assistance of U.S. Geological Survey personnel. These assignments will provide the occasion for professional advice and on-the-job training by the U.S. advisers, in proper survey techniques, survey planning, and program administration. In addition, the scientific and administrative capabilities of the Brazilian agencies will be strengthened and broadened by participant training in the United States.

The USGS has been selected by the Brazilian Government as the organization best qualified to assist the DNPM and DNAE establish themselves as agencies capable of carrying out nation-wide programs of mineral evaluation and hydrologic data collection. Essentially, the two departments will be carrying out activities paralleling those of the USGS in the United States. Private contractors

for this reason were not deemed suitable to provide the necessary technical assistance to these aspects of the program. However, after projects have been clearly delineated so that necessary consultant services can be described in specific terms, such services will be obtained from private sources. A.I.D. grant-financing of USGS advisers is scheduled to terminate on June 30, 1967. If the A.I.D. loan funds can be made available by that time, the services of USGS advisers now in Brazil will be available to carry out the Mineral and Water Resources Survey Program.

Through FY1966, A.I.D. and predecessor agencies invested approximately $5.7 million of grant technical assistance funds in the Brazilian natural resource area. The grant activity "National Minerals Survey and Geological Training" (512-11-120-252.2) will be continued under the proposed loan as the "Bahia Project" (DNPM-1); the "Hydrological Data Collection and Analysis" grant activity (512-11-120-252.3) will become the "Hydrologic Data Collection" project (DNAE-1) under the loan; and the "Exploration of Ground Water Resources for Improved Land Use" grant activity (512-11-120-252.4) will continue as the "Ground Water Project" (DNPM-5) under the loan. The DNPM "Central Brazil Project" (DNPM-2), "Tungsten Project" (DNPM-3), "Phosphate Project" (DNPM-4) and the DNAE "Photogrammetric Service" (DNAE-2) and "Combined Tariffs, Licenses, Statistical and Administrative Services" (DNAE-3) projects represent new areas of A.I.D. assistance.

In a recent evaluation of the AID/Brazil Natural Resources Survey Program, an AID Evaluation Team headed by C.Tyler Wood has noted that "the USGS has some remarkable achievements to its credit in Brazil. First, USGS geologists played an important part in the discovery of large deposits of iron ore, manganese, and other minerals in Brazil. The activities leading to these accomplishments were started during World War II, when the U.S. needed access in the Western Hemisphere to adequate supplies of critical materials. These discoveries have added significantly to the rate of Brazilian development.

"Secondly, as previously pointed out, the USGS has laid a sound foundation for the creation of Brazilian capability to explore and identify its mineral resources. It has helped build an institution which, we are confident, will continue to grow - in which there is a strong multiplying factor inherent in the number of trained geologists being produced who, in turn, will be capable of training steadily increasing numbers of others.

"Thirdly, and of broader significance, the USGS people, during the 25 years of their presence in Brazil, have made a deep and lasting impression. Such reputations are made only by men who are both eminent in their profession and possess qualities of mind and spirit that command admiration. The U.S. has an asset of great value in the image which has been created in Brazil by the USGS."

B. Role of USGS and/or Private Consultants in Brazilian Development

The technical assistance projects to be financed are "pre-investment" activities in priority sectors of the Brazil economy. Geological and minerals surveys are being given a high priority by the GOB. This is because minerals have played a key role in national development and the pattern of such development for many nations is dependent on the extent, nature and utilization of its mineral resources. In Brazil the minerals reserve situation is of even greater importance--today, this segment of its natural resources provides one of the means by which Brazil can undertake to resolve its balance of payments problems. At the present time, the value and significance of mineral resources are being determined through the research in geology by Brazilian federal agencies. The magnitude of the job for a country of such size as Brazil requires massive and coordinated effort and financial support to conduct the work on a systematic and carefully planned national basis.

The enormous water supply of Brazil, with its potential to provide hundreds of millions of kilowatts of power, to irrigate millions of acres of water-short land, to expand inland navigation, to provide for flood control and for public and industrial water supply and pollution control, depends on the availability of adequate hydrologic information for proper planning and design. An expenditure of $10,000 in streamflow research can result in a saving of $10,000,000 when building a hydroelectric plant. The huge capital investments involved in water resources development require hydrologic research of high professional and scientific quality.

Natural resources surveys are essential to national development and must necessarily be undertaken by government agencies because the expenses involved are too great for individual producers to bear and it is the only mechanism in which the results can be published for the benefit of the community at large and for the stimulation of investment and development by the private sector.

The Government has indicated the degree of priority it assigns to the Mineral and Water Program in the drawing up of the Ten Year Plan for the Mineral Evaluation of Brazil and in the present reorganization steps it has taken to strengthen the DNPM and DNAE. In consultation with AID the Ministry of Mines and Energy has selected certain projects of the Ten Year Plan for AID assistance. The projects selected represent, in the minerals area, surveys and investigations of mineral reserves offering the most promising economic prospects and which are not benefiting at present from adequate commercial exploitation. Similarly the activities to be carried out with the DNAE have been carefully selected to correct shortcomings in DNAE activities and provide essential hydrologic data not being sufficiently developed by other agencies.

The Brazilian government has planned a number of major programs in the natural resources area. In addition to the Mineral and Water Program, they have proposed river basin programs including a plan to develop the vast Sao Francisco Valley area in the Northeast and the Taquari River in the southeremost state of Rio Grande do Sul. An AID loan has been requested for the Sao Francisco program and AID-provided funds at the Fundo de Financiamento de Projectos e Programmas (FINEP) are being sought to carry out a pre-investment study and regional master plan for the Taquari area.

SECTION II - HISTORY AND BACKGROUND

A. Mineral Resources Surveys

Cooperative programs for the study of Brazil's mineral resources date back to 1940. During World War II this assistance was carried out on a war emergency basis and consisted principally of geologic investigations, mineral evaluation, beneficiation tests and related projects to assist in developing mineral commodities critical to the Allied war effort. In 1948, the governments of the United States of Brazil and the United States of America recognizing the mutual desirability of continuing the cooperative program established in 1940, entered into a 10-year agreement (1948-1958) for the purpose of further scientific collaboration between geologists, engineers and metallurgists of the two countries, through the U.S. Bureau of Mines and the U.S. Geological Survey of the Department of the Interior of the Government of the United States and the Departamento Nacional da Producao Mineral of the Ministry of Agriculture of the Government of Brazil, in various projects relating to the mining economy of the two countries.

In 1959, a second ten-year agreement was signed between the two governments represented by the DNPM and the United States Operations Mission (now USAID). The objectives of this ten-year program were primarily to develop the cartographic and topographic mapping facilities, library and scientific laboratory facilities, to develop urgently needed Brazilian geologists by participation in the Geological Education Project and to establish a series of geology departments in various universities. During the 1959-1967 period, major efforts were directed at improving and expanding training of geologists at the undergraduate level. In addition, A.I.D. technical advisers assigned in a number of geological and mineral resources investigations and non-ferrous metal projects. At this point, with the development of facilities in DNPM and with the recruitment of Brazilian geologists supplied through the Geological Education Project efforts were turned to systematic geologic investigations and mapping of specific areas of Brazil.

Previous USGS activities in Brazil in the field of mineral resources studies have supplied published data which has served as the basis for extensive private investment. For example, USGS bulletin 946-A on manganese deposits at Urucum, Mato Grosso, was followed by the development of the Companhia Meridional (U.S. Steel). Another USGS bulletin, 964-A, on manganese in the federal territory of Amapá, was instrumental in obtaining a $60,000,000 loan from the Export-Import Bank for a joint venture by Bethlehem Steel and Antunes. A number of USGS bulletins and professional papers on the "Quadrilátero Ferrífero" presenting accurate data on iron-ore reserves was largely responsible for the presently estimated 100 million dollars per year of iron and manganese ore exports. Publication of this data proved that existing Brazilian iron-ore reserves were sufficient to maintain Brazilian steel production and also a large export capacity. Similarly, mineral exploration in Bahia in the copper belt has resulted in more than 100 applications for prospecting rights that have been filed with the GOB. It is expected that from this general interest by private individuals and companies that the beginning of a copper mining industry can be established. In accordance with both A.I.D. and USGS policy, the GOB will be encouraged to stimulate private industries through publication of data collected. Few private companies can afford the scientific study necessary to produce the mineral and hydrological information that will be made available as a direct result of this loan.

B. Hydrologic Surveys

Technical assistance in hydrologic work in Brazil has been provided the Government of Brazil by USAID since 1963, to increase the availability and improve the reliability of hydrologic data by increasing the institutional effectiveness of the Department of Water and Energy of the Ministry of Mines and Energy, and the Division of Hydrology of SUDENE. The collection and analysis of hydrologic data is a prerequisite for all engineering design of hydroelectric and irrigation projects, flood control and navigation studies, and municipal and industrial water supplies. Adequate and reliable data for planning such projects can save millions of dollars through the elimination of over and under-construction.

The hydrological data collection network has been appreciably expanded, with emphasis on the Northeast, and the reliability of field and office work has been considerably improved as the result of on-the-job training provided by USAID technicians. The backlog of raw data has been considerably reduced, particularly in the Hydrology Division of SUDENE. There, the computation of 1,100 station-years of daily stream discharge has been completed and the information made available to other government of Brazil agencies and the public and private sectors.

Much work and technical assistance is required to improve the facilities, practices, and methods for the collection, compilation, and distribution of hydrologic data throughout Brazil. This involves the training of hydraulic engineers in modern methods of collecting and analyzing hydrologic data and the centralization of control of collection, compilation and publication of data, including the standardization of forms. The networks of streamflow, rainfall and evaporation stations must be greatly expanded to provide hydrologic data essential for planning and design.

C. The Departamento Nacional da Produção Mineral (DNPM)

1) Organization

A service of the Brazilian government to study the geological resources of the country has existed since the latter part of the 19th century. Such service was of limited scope with few personnel and largely limited its activities to attempting to establish the broad outlines of the geology of Brazil. In 1934, with the promulgation of the Code of Mines, the Departamento Nacional da Produção Mineral (DNPM) was established with the function of being a regulatory agency of mining statutes. To this agency was added all other geological and mineral and water service activities of the government. Since its creation, the DNPM has been unable to obtain an adequate staff of Brazilian geologists which has hampered its planning for development of the mineral and water resources of Brazil. It has only been in recent years that Brazilian universities have been producing geology graduates, and it is only in the past few months that the federal government has increased the number of geologist positions in the DNPM to 163 an essential step toward the goal of establishing the agency as an effective technical arm of government in natural resources development.

A reorganization and reorientation of the DNPM has been published (Decree Nº 59.873 of 26 Dec. 1966) that provides the agency with the structure and means of carrying out the Minerals Plan, described below. This calls not only for administrative reorganization, but a large increase in its

staff of technical personnel, and consequent administrative and clerical staff, modernization of its laboratories and service facilities, library, cartographic services, increase in its field installations and equipment, transportation and communications. The greatest shortage is in young geo-scientists who have the training and know-how needed to carry out geologic mapping and mineral resources appraisal utilizing the many branches of the science, and who have the managerial experience to undertake in an efficient and productive manner field operations that can yield desired results in as short a time as possible.

In the USAID's judgment, the DNPM has the managerial and administrative capability to carry out the projects proposed for AID loan financing. The staff of DNPM will be assisted by USGS Geologists and U.S. Bureau of Mines engineers.

2) Role of DNPM

As a means of determining the value and extent of the mineral resources of the country, in the expectation that these resources will make a substantial contribution to national production in the eventual development of a self sufficient agricultural and industrial economy, the GOB through the Ministry of Mines and Energy established the Ten Year Master Plan for evaluation of the Mineral Resources of Brazil, 1965-1974. The DNPM has been designated as the executor of the Plan and the coordinator of all activities related to it.

The Plan indicates three types of activities to be undertaken in its implementation: (a) Geologic mapping of the entire country at a scale of 1:1,000,000; (b) "Basic Projects" of mapping and regional resources evaluation, undertaken at a scale of 1:250,000; and (c) "Specific Projects" of detailed mapping, drilling sampling and assaying of specific mineral deposits (including ground water) or of mineral districts, for purposes of bringing such deposits or districts into production and utilization at the earliest possible date. An Advisory

Council for the Ten-Year Plan provides the DNPM with orientation and guidance in the preparation of plans for implementation of the Plan.

The Projects proposed for AID loan financing have been selected by DNPM in accordance with guidance and advice provided by an Advisory Council for the Ten-Year Master Plan for Mineral Evaluation of Brazil. The projects have been selected to develop basic geological information important in the eventual development of important regions of Brazil, not only for mineral resources but for land utilization planning, including land classification, water power, irrigationk soils, agriculture, rural development and highway and power line construction.

D. The Departamento Nacional de Águas e Energia (DNAE)

1) Organization

The Department of Water and Energy was organized as a separate department within the Ministry of Mines and Energy in mid-1966. Until then its many present functions were exercised by several government divisions, hydrology being conducted by the Division of Water of the National Department for Mineral Production (DNPM). By concentrating all activities in hydrology (surface water) and many of the power and energy regulatory and standardization services in one department of government, the Ministry has greatly increased the availability of these services for efficient infrastructure design and for national planning of water resources development. During the period when the DNAE was at the Division level, it received minimal assistance from AID under grant funding. This assistance was in advisory services of USGS hydrology specialists in data processing and publishing, and in reorganization of the Division into a Department.

A reorganization and reorientation of DNAE is under study to provide the agency with the structure and means of carrying out the responsibilities assigned and defined by the federal laws of Brazil. This calls for administrative reorganization, a large increase in its staff of

technical personnel (which the Federal government has recently authorized), and supporting personnel, modernization of its laboratories and service facilities, field installations and equipment.

In the USAID's judgment the DNAE has the managerial and administrative capability to carry out the projects proposed for AID loan financing. The staff of DNAE will be assisted by USGS technicians and one FPC or TVA statistical expert.

2) Role of DNAE

Implementation of a national water and energy program is the responsibility of the newly established DNAE, and includes development of a nation-wide net of hydrologic, rainfall and evaporation measuring stations, developing data for selection of sites for hydroelectric power development, the distribution of electricity and the establishment of rates and tariffs for energy consumption throughout the national territory.

The specific projects proposed for AID loan financing have been selected by the DNAE in accordance with the responsibilities defined by federal law and under which federal appropriations are made to the agency. The projects are designed to serve the National and public interest by providing essential hydrologic data for planning and design for land classification, flood control, public and industrial water supply and pollution control, irrigation, and development of electric power.

SECTION III - DETAILED DESCRIPTION OF THE PROJECTS

A. DEPARTAMENTO NACIONAL DA PRODUÇAO MINERAL

1. DNPM-1 BAHIA PROJECT

Introduction

The Project will be financed by A.I.D. loan funds of $3,323,000 and GOB Budgetary funding of Cr$8,340,000,000 the equivalent of $3,799,000. The project will be completed by June 1971.

Through Project Agreement 512-11-120-252 (Bahian copper) of the Natural Resources Survey, signed with the Ministry of Mines and Energy (MME) and the USAID, the Bahia Project has been in existance as a Development Grant Project since July 1965 and was scheduled for phase-out at the end of five years in June 1970. Starting on July 1, 1967, financing of this project, as planned in this documentation, will be through technical assistance loan. The project has operated through a PASA with the U.S. Geological Survey (USGS) with the Departamento Nacional da Produção Mineral (DMPM) as counterpart agency. To June 30, 1967 A.I.D. will have provided the services of five USGS geologic specialists full time and on temporary duty costing $685,000, in addition to $53,000 for commodities and $125,000 for participants.

This project is behind schedule in implementation of the geologic mapping phases of activity due largely to the inability of the sub-contractor (Cruzeiro do Sul) because of unfavorable weather, to carry out photography, essential to the preparation of base maps required for the geologic mapping. Because of the delay in the air photography, the DNPM has increased the duration of the project to five years, four of which will be loan funded, for a phase-out date of mid-1971. The number of USGS specialists has been increased from five to six.

Purpose and Importance

Started late in 1964, the Bahia Project is designed to meet the double purpose of: a) geologic mapping and mineral resources appraisal of a large region of Brazil known to contain important mineral resources and to be an area of potential settlement, and b) to train young geoscientists in modern techniques of field and laboratory investigations, and report preparation; and prepare an administrative cadre that can lend effective support to efficient operations, working within the framework of existing Brazilian regulatory statutes. The Project is one of the "Basic Projects" as outlined in the Ten-Year Plan and its mission is the specific implementation of a part of the Plan. Final reports of the project will present the geology of the Project region, about 250,000 square kilometers, as geological maps at a scale of 1:250,000 as well as reports on mineral deposits of the region, including the base metals (copper, lead, zinc, iron, manganese, antimony, tin) the light metals (magnesite, bauxite, barite) and construction materials and chemical materials. In addition to this information, the base topographic and geologic maps produced will serve for planning purposes in projects in hydrology, groundwater, soils, agriculture, rural development, irrigation and engineering (routes for highways, railroads, power lines). Careful attention will be paid to mapping and mineral appraisal activities of regional and local organizations. The USGS technicians will assist the DNPM in coordinating these activities and defining the roles of the respective agencies involved.

In addition, the Bahia Project can serve to train personnel who will help to staff other basic projects.

The Ten Year Plan specifies that the DNPM is the repository of all information regarding minerals and is responsible for the development of mining technology in Brazil. A.I.D. assistance to the Bahia Project will also provide advisory services in the establishment of a mineral statistics office and in mining technology and development services for the Division of Mining Development of the DNPM.

Project Targets

To achieve the objectives of regional resources evaluation and geologic of the Bahia Project area, by June, 1971, the following targets are established:

1. Complete the geological mapping and mineral resources appraisal of the area of about 250,000 square kilometers in central Bahia State bounded on the North and South by the 10th and 15th parallels of latitude and on the East and West by the 38th and 43rd meridians of longitude.

2. Complete the systematic geological mapping of the project area of 20 one-degree quadrangles at a scale of 1:250,000.

3. Complete a systematic mineral resources appraisal and evaluation of all known mineral localities within the Bahia project area.

4. Publish geological maps and reports and mineral evaluation and appraisal reports on the entire Bahia Project area.

5. Publish a Geological Map of Bahia at a scale of 1:2,000,000.

6. Publish a metallogenic map of the State of Bahia at a scale of 1:2,000,000.

7. Establish for the DNPM a cadre of young geologists and geo-scientists with a high proficiency of professional competence in geological mapping, mineral resources evaluation and appraisal, mineral prospecting, mineralogy, petrography and general resources inventory.

8. Establish an adequate administrative and managerial structure within the Project that, through experience

gained with the project is in a position to operate other basic projects of the DNPM as required by the Ten-Year Plan.

9. Obtain adequate and appropriate additional space for technical services needed by this and other projects of a basic or specific scope of activity by constructing an additional floor to the present headquarters of the DNPM, Rio.

10. Improve the supporting technical services of the DNPM, including the library, the cartographic services, analytical laboratories and beneficiation laboratory.

11. Upgrade and streamline editorial and publication procedures as a means of establishing easy and rapid access of geological maps and mineral resources information to the general public.

12. Establish a mineral statistics office that, using modern techniques of data compilation, can provide a public information service on mineral development and trade in Brazil.

13. Upgrade the mining advisory service of DNPM in the general field of mining technology and development of all the mineral commodities list as deficient by the Ten Year Master Plan.

The Course of Action

The loan will finance the costs of:

1. Six geologic specialists from the staff of the U.S. Geological Survey, who have a wide range of experience in regional geological mapping and mineral resources evaluation and appraisal.

2. Training geologists in the field and laboratory on specific mapping, prospecting, mineral evaluation and mineralogy and petrography projects under the

instruction, guidance or supervision of USGS geologists or senior DNPM scientists; chemists and other laboratory specialists to work under the instruction and supervision of USGS specialists or senior scientists of the Laboratório da Produção Mineral. Selected personnel will receive special additional instruction in techniques of mineralogy, petrography and photogrammetry, as may be arranged.

3. Providing 52 man-years of in-service or academic participant training in the United States to Brazilian personnel. This is at an approximate average rate of 13 men per year which is the expected recruitment rate for the Bahia project. Training grants will be provided for periods of 12 months, 8 months, and 4 months, depending on the type training desired and the length of time needed for satisfactory training in a given subject. Specialities in which personnel will be trained will be economic geology, geochemistry, analytical chemistry, engineering geology, photogeology, petrography-mineralogy, structural geology and tectonics, sedimentology, general geology and geological administration and management. When it is not possible in any year to fill the participant quota with personnel of the Bahia Project, personnel may be selected from other projects or activities of the DNPM.

4. Providing financial and administrative support to the DNPM library in order to modernize its facilities and to upgrade its services by contracting additional professional librarians and administrative staff. AID also will train in the U.S. one or more senior members of the Library staff in modern techniques of library services and facilities.

5. Installing laboratory facilities, in effect non-existent in the DNPM at present, in photogeology, geochemical prospecting and sedimentology, associated with the Bahia Project operations, but available for use in other DNPM activities.

6. Supplementing by additional purchase of instrumentation, existing x-ray diffraction and mineralogical and petrographical equipment and services, available in the Division of Geology, for use of the Bahia Project as well as general use of other activities of the DNPM.

7. Purchasing modern instrumentation in spectrochemistry and analytical chemistry for installation with the Laboratório da Produção Mineral in order that these services are more effectively available for use of the Bahia Project as well as other activities of the DNPM.

8. Purchasing equipment for a general paleontological laboratory, which does not exist in the DNPM, to upgrade research facilities as a means of providing much needed support to the Bahia Project and other geological activities of the DNPM.

9. Providing at project headquarters in Rio and at field headquarters in Vitória da Conquista, such repair and maintenance facilities as are feasible for all equipment, vehicles and radio communication equipment.

10. Through sub-contracting services, obtaining serial photography of all of the Bahia Project area at a scale of 1:70,000 for use in field mapping as well as compilation of base maps.

11. Obtaining through the Conselho Nacional de Geografia, or through a sub-contractor in the private sector, the establishment of field control of air photos and the compilation of base topographic maps on which to compile field geologic mapping for publication of a scale of 1:250,000 of the 20 degree quadrangles of the project area.

12. In the course of geologic mapping of the project area, appraising all known mineral occurrences and make general evaluations of all such deposits as may appear to be of a magnitude that may result in their development as a producing mineral property.

13. Undertaking such geological and geochemical studies as may indicate the existence of mineralized belts or districts, and the structural controls and other factors on mineral distribution and concentration in the project area.

14. Providing full time, for two years, two mining engineering specialists from the staff of the U.S. Bureau of Mines, one a mineral statistics expert to undertake the establishment of a mineral statistics section with the DNPM and one a mining engineering expert in mining technology and development of base metal and non-metallic mineral deposits to work in an advisory capacity with the Division of Mining Development of the DNPM.

15. Providing one and a half man-years of temporary duty services for specialists in geological investigations of mineral deposits, mineral economics and mining.

16. Providing one senior geologist from USGS staff to serve as principal U.S. program coordinator for the DNPM and DNAE projects and one geologic program assistant whose functions will be to coordinate administrative matters for these projects. Although these positions are listed under this Bahian Project, costing will be prorated to all project accounts of this loan program of the Ministry of Mines and Energy.

GOB will:

1. During the four-year term of this project, assign 50 to 64 young Brazilian geologists to the project who will work under the technical supervision and guidance of the USGS specialists assigned to the project or of senior DNPM specialists. The training rate of Brazilian personnel will be from 10 to 16 per year and will average about 13 per year. The type of training to be administered to these personnel is as follows:

	Trainees per year
Photogeology	2
Regional geologic mapping	5
Economic geology	3
Geochemical prospecting	1
Mineralogy and petrography	1
Chemistry	1
	13

2. Provide an adequate staff of mining engineers and technicians plus adequate facilities to carry out work in mining technology, mineral statistics and mineral beneficiation for the project under the guidance of U.S. Bureau of Mines specialists.

3. Provide adequate administrative and clerical personnel to staff the Bahia Project, to service technical personnel and activities of the Project. Such service personnel should not number more than the technical personnel of the project.

4. Expand space facilities at project headquarters in Rio de Janeiro to allow for about 9 square meters of work space for each geologist on duty in Rio with the project, and no less than 400 square meters of space for administrative use and for sample and map storage, in addition to such laboratory space as is needed, available in the DNPM building

5. Use the Fundo de Mineração of the DNPM as seems appropriate and in accordance with GOB regulations to support with cruzeiro funds the operations of the Bahia Project, not only in contingencies but as the Project activities may expand and evolve.

6. Pay project technical personnel salaries that are comparable to going salaries in private industry of Brazil, to be disbursed as basic salary, as special emolument as approved by the Ministry of Mines and Energy and by payment of per diem and field expenses.

7. Create administrative policies and procedures for administrative control and logistical support of all operations of the Bahia Project, including procurement, disbursement and accounting procedures, cost analyses, audit support, all executed within the current statutory regulations of the GOB.

8. Provide space for a general paleontological laboratory.

9. In order to upgrade and maintain high standards of report and map preparation and processing toward publication, and to establish standards of acceptance for report texts and illustrations, geologic and topographic maps, create a formal editorial and technical review system for all manuscripts, and establish norms and format for the DNPM geologic cartography office.

Progress to Date

The Bahia Project has been in existence since 1964. In the time since its inception the following has been accomplished:

1. The Boquira Quadrangle and the Morro do Chapéu Quadrangle, geological maps at a scale of 1:250,000 have been completed and are now in final cartographic compilation for publication. These two quadrangles represent 10% of the total project area.

2. Geologic mapping is well in progress in two other quadrangles, the Macubas Quadrangle and the Barra do Mendes Quadrangle. Some reconnaissance work has been undertaken in others.

3. Geochemical prospecting for copper deposits have been completed and reports prepared and published on the copper region of northern project area, centered around the Caraíba copper deposit, east of Bonfim.

4. Resulting in part directly from field geochemical investigation, and indirectly through interest generated in the region through field investigations of project personnel, local "prospectors" have carried on additional work on their own to the extent that several Brazilian mining companies have officially requested the DNPM for more than 200 "prospecting rights" in as many copper localities or showings in the project area.

5. A final report is now in preparation which is the result of one year of field work in the correlation of the comparatively well-known geology of the Quadrilátero Ferrífero of Minas Gerais and the rocks of the northern part of this state, with those of Bahia in the project area.

6. A geological map of the Boquira Lead Mine has been completed as a geochemical study of the lead content of soils and stream alluvium in the region of the Boquira Mine.

7. Completion of a plane table geological map and sampling of the Matino copper locality, 60 kilometers east of the Boquira Mine, done to determine the geologic setting of copper in this region, and as a means of training.

8. Preparation of a manuscript copy of the Geological Map of the State of Bahia at a scale of 1:2,000,000.

9. Completion, in collaboration with the Geochronology Laboratory of the University of São Paulo, of a number of isotopic age determinations of rocks of the project area for correlation purposes.

10. Assemblage and use in field work of an experimental mobile, truck-mounted geochemistry laboratory that is capable of producing several hundred analytical determinations per day on site, in the field, at a mineral locality.

11. A start has been made in establishing a service laboratory for the project, in Rio, to provide chemical, mineralogical and petrographical analyses for project field activities.

12. Administrative procedures have been established, within the statutory regulations of the Brazilian government, for purchasing of needed field, office and

laboratory supplies and equipment, as well as the payment of personnel salaries, that facilitates smooth operations and logistical support to all activities of the project.

13. New air photography at 1:50,000 scale has been completed through a sub-contractor for about one-third of the project area. This photography is basic to the undertaking of geologic mapping in the field.

14. Because of a delay in obtaining air photographs by the sub-contractor, due to unfavorable weather for photography in certain portions of the project area, there has been a consequent delay in the compilation of the topographic base maps on which are plotted the geological data resulting from field work. This has resulted in the project being behind schedule in completion of plans, and has placed the work of the field parties ahead of the base map preparation.

15. Field headquarters have been established in a rented house at Vitória da Conquista. This provides field office space, interim living accommodations and storage facilities for field equipment, supplies and vehicles.

16. Radio sets have been purchased and are now being installed to provide communications between project headquarters in Rio, field office in Conquista and the field parties that may be working in the large territory of the project area.

17. In order to provide project staff as well as other DNPM personnel with current geological literature, assistance has been given to the Library of the DNPM in procurement of journals and texts as well as other library services.

18. Office and laboratory space have been provided in Rio for project operations, despite rather severe space shortage in the building housing the DNPM. This space includes office space for each field party, used for compilation of field data for preparation of

geological maps and reports, and laboratory space for various analytical determinations made on samples collected during field work.

19. Sixteen young geo-scientists are now being trained in various field, office and laboratory techniques related to geological investigations, including geologic mapping at various scales of regional geological features, mineral localities, mines in production, geochemistry, photogeology, plane table mapping, mineralogy, spectroscopy, petrography, and map compilation and report preparation.

20. Working contacts have been made with the laboratories and geology departments at the University of São Paulo and Bahia and with the Instituto de Tecnologia Industrial at Belo Horizonte. Such contacts, mainly for analytical services in geochemistry and geochronology are of benefit to both the project and the institutions.

DNFM-1

BAHIA PROJECT BUDGET
(In thousands)

1. A.I.D. Dollar Disbursements
LOAN

	FY 1968	FY 1969	FY 1970	FY 1971	Totals
Technicians (2 USBM for 2 yrs. 6 USGS Full-time)	208	208	156	156	728
International travel & transp. of HHE	40	40	30	30	140
USGS and USBM Tech/Admin. Support (Lab Services, report/map prep. publication, TDY spec.)	72	72	54	54	252
Participant Training in the USA (In-service & academic) Includes per diem and international tvl, tuition, books, costs. (Equiv. to 52 man years)	117	117	117	117	463
Commodities (Specialized, scientific for field & laboratory operations)	100	100	100	50	350
Sub-Totals:	537	537	457	407	1,938
2. Cruzeiro Costs in Dollar Equivalent LOAN					
Commodities (local procurement for field vehicles, field equipment, lab. equipment & supplies in support of operations)		110	100	100	310
Other Costs (Contract Services for aerial photography, helicopter services, base map compilation & reproduction services, etc.)		325	350	400	1,075
Sub-Totals:		435	450	500	1,385
Total Loan Funding:	537	972	907	907	3,323
3. GOB Direct Funding (Cruzeiro costs in dollar equivalent)					
Salaries, Personnel Benefits, etc.	392	410	430	450	1,682
All other expenses for field, office, & laboratory operations	827	410	430	450	1,682
Total GOB Direct Funding:	1,219	820	860	900	3,799

2. DNPM-2 CENTRAL BRAZIL PROJECT

Introduction

The project is financed through a USAID loan of $783,000 and GOB budgetary funding of Cr $1,394,000,000, (the equivalent of $633,000) over a period of three years.

The Central Brazil Project is one of the larger of the "Basic Projects" specified in the Ten Year Master Plan for Mineral Evaluation of Brazil, 1965-74. AID-financed technical assistance will be provided for intensive geological and mineral investigation of about one-sixth of the total area of the Central Brazil Project, in the expectation that on completion of this intensive phase, the boost given to project operations will provide the impetus to carry it to completion in the period of the Ten Year Plan.

Three USGS geologists, specialists in regional geology, ultrabasic rocks and evaluation of minerals, will be assigned to the project which is scheduled for phase-out in June 1970.

Purpose and Importance

As outlined in the Ten Year Master Plan, the Central Brazil Project, one of the "Basic Projects" of the Plan, covers an area of 24 square degrees (12 to 18 degrees Latitude and 46 to 50 degrees Longitude) of territory, largely in the State of Goiás. The activities included in this technical assistance loan includes mapping one-sixth of the Central Brazil Project, about 50,000 square kilometers in four square degrees of area, over a period of three years as a means of giving an impetus toward eventual completion of the project in the term of the Ten-Year Plan. The area selected for this phase of the project is known to contain an extensive belt of serpentinized ultrabasic rocks with deposits of tin, copper, asbestos, nickel and cobalt, and favorable for the occurrence of other deposits associated with this type of rock, iron, manganese, platinum and chromium. Beyond the determination of the mineral potential

of the region, the project will also establish basic geological information important in the eventual development of this important region of the heartland of Brazil, adjacent to the National Capital, that are useful in resources and land utilization planning, including land classification, water power, irrigation, soils, agriculture, rural development and highway and power line construction.

There is available general knowledge of the geological setting of the region through a recently published report by the DNPM on the "Projeto Araguaia" at a scale of 1:1,000,000, of the territory north and northwest of the project area. In addition, basic geologic information is available in reports being prepared by DNPM on the regional geology to the west in Mato Grosso. Some geological correlation work has already been completed by personnel of the Bahia Project, of rocks in the Bahia area, across Minas Gerais into southern Goiás within the Central Brazil Project area.

In greatly increasing its staff of young geologists, the DNPM will need to train these new staff members in techniques of geological mapping and mineral resources evaluation. This project will provide in-service training, in the field, office and laboratory for 12 or more geologists under the supervision and guidance of one senior DNPM geologist who will be the administrative chief of the project, and three or more USGS geological specialists in the type of geology and mineral deposits known to exist in the project area.

Project Targets

1) Complete geological mapping of approximately 50,000 square kilometers of four square degrees of territory within the Central Brazil Project area, in the headwaters drainage of the Tocantins and Paraná rivers in the State of Goiás.

2) Complete the geological mapping on 16 one-quarter degree (15 minutes) quadrangles at a scale of 1:100,000 of area delimited as follows: Four quadrangles between 13°00' and 15°00' Lat. and 48°00' and 48°30' Long.; ten quadrangles between 14°30' and 17°00' Lat. and 48°30' and 49°30' Long.; and two quadrangles between 17°00' and 18°00' Lat., and 49°00' and 49°30' Long.

3) Complete the evaluation of all mineral localities and specific appraisal of those localities which indicate promise for development on that may be of significance in determination of mineral provinces or epochs in the region.

4) Complete geological and mineral reconnaissance investigations of areas adjacent to the project, to provide a better understanding of the rocks and minerals of the region to be mapped in detail.

5) Publish geological maps and reports, and reports on mineral evaluation on all work undertaken in the project area.

6) Publish a metaloganic map of the region showing mineral localities, mineral districts, metaloganic provinces and epochs.

7) Train 12 or more young Brazilian geologists, members of the staff of the DNPM, in all phases of geologic investigations of the rocks and minerals of the region, essential laboratory techniques, and report and map preparation.

Course of Action

The AID loan will finance the costs of:

1) Three, full-time USGS specialists for the project, two in regional geology and one in the economic geology of mineral deposits associated with ultrabasic rocks.

2) One man year of temporary duty services of specialists of the USGS or other agency, to undertake specific assignments with the project in connection with mineral resources investigations.

3) Participant training in the U.S. for at least 10 Brazilian geologists who will have worked for the project. This training will be in practical service in field or laboratory with the USGS in connection with the geology of ore deposits, or academic training in this field with an American university.

4) By sub-contracting, providing aerial photographs and base map compilation in order that these materials are available in a timely fashion to geologists engaged in the geological mapping and mineral resources work.

5) Five field vehicles, along with boats, two outboard motors, pack animals and such plans and vehicle charters as may be required for efficient operation of the project field investigations.

GOB will:

1) Assign one senior DNPM geologist to the project, who will be the administrative chief of the project, and at least 12 young Brazilian geologists, members of the staff of the DNPM, to work with the project for its duration.

2) The DNPM will provide adequate administrative and clerical support services and personnel, including drivers, field assistance, and drillers.

3) Mineral evaluation work will include drilling to shallow depths with such equipment as may be available with the DNPM or that may be subcontracted to Brazilian private firms.

4) The DNPM will provide all necessary field, office, and laboratory equipment and facilities, and pay for the maintenance and operating costs of all vehicles and equipment.

5) Field headquarters will be established at the DNPM regional office in Goiânia, Goiás. Radio equipment will be purchased and installed by the DNPM to maintain a communication between all field parties and field headquarters.

DNPM-2

CENTRAL BRAZIL PROJECT BUDGET

(in thousands)

	FY 1968	FY 1969	FY 1970	Totals
1. A.I.D. Dollar Disbursements:				
LOAN				
Technicians (3 USGS Full-time)	78	78	78	234
International travel & transp. of HHE	15	15	15	45
USGS Tech/Admin Support (Lab Services, report/map prep. publication, TDY spec.)	27	27	27	81
Participant Training in the USA (In-service & academic) includes per diem and international tvl, tuition, books, costs.	31	31	31	93
Commodities (Specialized, scientific for field & laboratory operations)	50	50	20	120
Sub-Totals:	201	201	171	573
2. Cruzeiro Costs in Dollar Equiv.				
LOAN				
Commodities (Local procurement for field vehicles, field equipment, lab. equipment & supplies in support of operations)		60	50	110
Other Costs (Contract Services for aerial photography, helicopter services, base map compilation & reproduction services, etc.)		50	50	100
Sub-Totals:		110	100	210
Total Loan Funding:	201	311	271	783
3. GOB Direct Funding (Cruzeiro costs in dollar equivalent):				
Salaries, Personnel Benefits, etc.	68	91	102	261
All other expenses for field, office and laboratory operations	178	91	103	372
Total GOB Direct Funding:	246	182	205	633

3. DNPM-3 TUNGSTEN PROJECT

Introduction

The project is financed by A.I.D. loan funds of $393,000 and GOB budgetary funding of Cr$500,000,000. (equivalent to $237,000), over a two year period. One USGS geologist will be involved.

This project is intended to determine the possibility of re-establishing the production of the tungsten (scheelite) mining district centered in central Rio Grande do Norte.

Purpose and Importance

This project is undertaken as one of the "Specific Projects" of the Ten Year Master Plan to Evaluate the Mineral Resources of Brazil, 1965-1974.

The tungsten (scheelite) deposits centered in central Rio Grande do Norte were for many years a valuable economic resource. Discovered in the early 1940s, the earliest geological and mineral investigations of the scheelite deposits were conducted during World War II jointly by geologists of the Departamento Nacional da Produção Mineral (DNPM) and the US Geological Survey (USGS). These reports with maps were published by the DNPM. From the middle 1950s to the early 1960s, as many as 19 mines were, at one time or another, in operation in this tungsten district of which Currais Novos, Rio Grande do Norte, is the largest center. The income from scheelite production gave to the region a substantial economic boast. Currently, only one mine and a few prospects are producing a few tons of concentrate per month.

Although studies of the tungsten reserves already exist, the studies are too general and lack sufficient data for private industry to make an investment decision. The combination of a drop in the world price for tungsten and a lack of technical knowledge closed the majority of Brazilian tungsten mines formerly in operation in the Recife area. In the last three years, the price of tungsten has risen from 20 dollars per short ton unit to 43 dollars. A combination

of the increased price combined with the publication of complete geological data which this project is designed to supply may again make tungsten exploitation an attractive investment in Brazil. Detailed geological data could provide, if favorable, an independent source of information which would support the private mining companies' efforts to obtain financing. Although it is possible for private investment to carry on their own exploration of this nature, the GOB considers that speed and a need of comprehensive development of the tungsten area require a government survey program. It is believed this program could stimulate significant private investment with resulting benefit to the jobless Northeast. If survey results are negative, a sound body of geologic information will have been gathered to forestall further effort and expenditure of scarce investment capital that could be used in a higher pay-off area.

During the boom years of activity, little technical study was made toward identifying ore controls and guides, there having been a lack of mapping, sampling and assaying of the ores as mining proceeded. During the early 1960s, the "Bureau de Recherches Geologiques a Miniers" of France undertook, on behalf of SUDENE, a general reconnaissance and inventory of the scheelite mineral district. It is reported that the French organization located upwards of 250 scheelite localities, including about 20 mines that at one time or another in the last 20 years were producers but nearly all of which are now closed. The French organization also reported an estimated reserve of about 130,000 metric tons of tungstate in the 5,000 square kilometer mining district which would mean that the district has one of the larger reserves of tungsten in the world.

The project is designed to attempt to establish through detailed geologic mapping, studies of ore controls, drilling, sampling and assaying of the deposits and their geological environment and the feasibility of re-establishing this tungsten district to its former importance as a producer of scheelite and consequent prosperity for the region.

As stated above, it is the expectation that through this project sufficient basic geologic and mineral data will be compiled to establish the basis for stimulating the interest of the private mining community in Brazil in organizing a coordinated mining operation in the district. This will have the added effect of making the country self-sufficient in tungsten as well as providing foreign exchange through export of excess of needs. Moreover the project will serve as a means of training young geologists of the DNPM in economic or mining geology, making them qualified.

As the geological investigations of the district proceed, examinations of existing tungsten mines will be made to determine the feasibility of study of the mines and determination made of the best technology to be adopted in opening new mines. In addition a mineral beneficiation plant will be established that will provide basic information on processing of the scheelite ores as well as a testing plant for other ores from the region.

The project is of two-year duration, undertaken jointly by the USGS and the DNPM. A senior USGS man and a DNPM counterpart will work with the assistance of a junior staff implementing project objectives and targets. Even though Brazilian universities are now graduating a number of geologists, these young people have not the opportunity of obtaining the necessary know-how in the specialized techniques of mineral district studies. This project is planned specifically to serve the double purpose of attempting to re-establish what was once a prosperous mining district, and training a number of DNPM's younger staff in modern techniques of geological evaluation of an important mineral district.

Project Targets

This project is designed to achieve the following targets:

1) Make accurate base maps to complete the geologic mapping of all or select portions of the 5,000 square kilometer tungstan mineral district of Rio Grande do Norte at a scale of 1:100,000 or at scales that may most accurately define geological features important in delimiting tungsten mineralization.

2) Determine through geologic mapping, drilling, sampling and assaying the structural ore controls of the tungsten mineralization and the detailed mineralogy of the ores, gangue and wall rock.

3) Establish guidelines for prospecting for further deposits of scheelite and delimit the areas within the district favorable for such prospecting.

4) Determine the economic factors relating to the possible re-establishment of this mineral district into an ore-producer at a scale commensurate to its potential.

5) Train four or more young geologists of the staff of the DNPM in mining geology and mineral district studies, through academic and in-service training in the United States.

6) Publish detailed reports and maps on the mineral district as a whole in order that interest might be generated in the private sector toward organizing a coordinated mining development program for the district.

7) Complete the project, including preparation of all final manuscripts of reports and maps, two years after it is started.

8) To assign two young mining engineers from the staff of the DNPM for in-service training in mining technology and beneficiation.

9) To provide such beneficiation equipment as will supplement that existing in the DNPM installations at Campina Grande, Paraíba, in establishing a beneficiation laboratory to process the scheelite ores of the district as well as other ores from the Northeast Brazil region.

10) To complete a study of all scheelite mines in the area and determine the best mining technology practices to be established for mining in the district, including a detailed survey of beneficiation procedures best adapted to these ores.

11) To train two or more young Brazilian mining , members of the DNPM staff, in all phases of mining technology and beneficiation as applied to this mining district.

Course of Action

The A.I.D. loan will finance the costs of:

1) One USGS geologist, a specialist in mining geology and structural control of ore deposits, to

undertake geologic studies of the tungsten district of Rio Grande do Norte.

2) All field equipment and instruments, including geochemical and geophysical instrumentation as will be required for field investigations.

3) Air photographs and base maps at scales needed to complete the geologic mapping; and provide cartographic services in compilation of final manuscript copy of all maps prepared from field investigations.

4) At least four field vehicles for use in the mapping programs and at field and regional headquarters of the project.

5) One U.S. Bureau of Mines engineer, specialist in ore beneficiation to undertake a detailed study of mine recovery and installation of new mines and the best beneficiation practices be adopted to handle the scheelite ores.

GOB will:

1) Assign one senior DNPM geologist or mining engineer and four additional geologist to undertake general mapping as well as mapping and sampling of mines and mineral localities. In the course of project activities, these personnel will be given in-service training in all phases of geological investigations of a mineral deposit, including underground mapping, sampling techniques, geological sections, geochemical and geophysical prospecting, plane table mapping, mineralogy of ore and gangue minerals, ore controls and final report and map preparation.

2) Provide administrative support, including clerical personnel, field assistants, drivers, drillers and

such other personnel and services as may be required by field, office and laboratory activities of the project.

3) Provide appropriate drilling equipment from existing equipment with the DNPM to determine geologic controls and reserves of scheelite ore in the mineral district.

4) Provide laboratory services for chemical, mineralogical, petrographic and geochronological determinations on samples collected during the course of field investigations.

5) Provide project headquarters at the DNPM regional office at Recife and field headquarters located at the DNPM field center at Campina Grande in the state of Paraíba.

6) Supply all maintenance and operating expenses of vehicles, drilling equipment and of all field and laboratory equipment.

7) Provide an adequate staff of mining engineers and technicians plus adequate facilities to carry out work in mining technology and minerals beneficiation for the project under the guidance of the U.S. Bureau of Mines specialist.

DNPM-3

TUNGSTEN PROJECT BUDGET
(In thousands)

1. A.I.D. Dollar Disbursements:
LOAN

	FY 1968	FY 1969	Total
Technicians (1 USGS and 1 USBM Full-time)	52	52	104
International travel & transp. of HHE	10	10	20
USGS USBM Tech/Admin.Support (Laboratory services, report and map publication, TDY specialists)	18	18	36
Participant Training in USA (Equiv. to 4 man years) In-service and academic	-	32	32
Commodities (Specialized scientific for mobile and station laboratories, geochemical, geophysical and ore beneficiation equipment)	100	80	180
Sub-Totals:	180	192	372
2. Cruzeiro Costs in Dollar Equivalent LOAN			
Commodities (local procurement for field vehicles, field equipment, lab equipment & supplies)		5	5
Other Costs (Contract service for aerial photography, helicopter services, base map compilation/reproduction services)		16	16
Sub-Totals:		21	21
Total Loan Funding :	180	213	393
3. GOB (DNPM) Direct Funding (Cruzeiro costs in dollar equiv.)			
Salaries, Personnel Benefits, etc.	45	45	90
All other expenses for field, office and laboratory operations	92	55	147
Total GOB Direct Funding:	137	100	237

4. DNPM-4 PHOSPHATE PROJECT

Introduction

This is a project of two years duration in which USAID will assign two USGS geologists, specialists in phosphate geology, mineralogy and geochemical prospecting methods. It will be financed with AID loan funds of $322,000 and GOB budgeting funding of Cr$687,000,000 (equivalent to $312,000).

Marine phosphorite was discovered at Olinda, near Recife on the northeast coast of Brazil in the late 1940s. Since the early 1950s a private mining company has been exploiting the phosphate deposits, with uncertain financial success in marketing the mining product as finally ground phosphate for direct application as plant nutrient. Distribution of this material is mainly in the northeast Brazil market; distribution in the south Brazil market has not been successful economically because of the high cost of production and transportation to the southern markets.

There has been little U.S. Government assistance to the development of this source of fertilizer material. In 1952, in connection with a minerals investigation project in Brazil, USGS geologists investigated the uranium content of the phosphate and made recommendations for the use of the trace amounts of radioactive substance in the phosphate as a means of prospecting for other phosphate areas that might crop out. In 1963, a USGS ground water specialist spent a month in Recife at the request of the GOB and provided advisory service to phosphate mining operations in connection with control of groundwater flow into open pit mining operations.

Purpose and Importance

In May 6, 1965, the Inter-American Committee on the Alliance for Progress (CIAP) expressed concern over the increasing disparity between the 2.5 percent rate of growth of the population of South America and the relative decline in per capita food production for the population. CIAP urged

the immediate establishment of research programs in the alliance countries to bolster food production. A means of substantially increasing agricultural productivity in Brazil lies in the widespread application of fertilizers, plant nutrients and soil conditioners to the generally depleted and the low quality soils of much of the country. Two important questions must be resolved in promoting the use of fertilizers for agricultural development: what is the availability and distribution of indigenous resources, and how can their use be made economically feasible for Brazilian farmers.

The purpose of this project is to determine the distribution and reserves of phosphate deposits through intensive geological investigations along the northeast coast of Brazil and the Jatobá sedimentary basin in western Pernambuco. The most intensive study will be made in the known deposits near Recife, extending geological knowledge of the reserves to the coastal regions to the north and south, establishing guidelines that can serve to assist the search for deposits along the entire coastal area. The Jatobá Basin deposits have only recently been found. There are marine phosphorite of an age comparable to those of the coastal deposit, but probably with a different geological setting. Detailed investigations will be made of these deposits to determine the quality and reserves of the material which might be used as agricultural fertilizer. Basic geologic and mineral data (maps and reports) will be compiled and published for public dissemination with the primary objective to stimulate the private mining industry.

Preliminary survey of the project area, 20 km wide and 100 km long, indicates that this area could produce phosphate more economically than the area now being mined in Olinda. Moreover, the Olinda source of phosphate ore is gradually becoming exhausted and costs will increase still further as mining continues. As phosphate ore is a low cost material transportation cost forms a large percentage of the final price. The area to be explored contains a navigable river, the São Francisco, which might supply cheap transportation for future production. This would enable the São Francisco river valley to be supplied with cheap phosphate which is now uneconomic if shipped from Olinda.

This project is one of the "Specific Projects" of the Ten Year Master Plan for Mineral Evaluation in Brazil 1965-74, phosphates being a mineral commodity in which Brazil is highly deficient. In addition to determining the reserves of phosphate in a portion of northeast Brazil, 8 or more Brazilian geologists will be trained in geological investigations of phosphate deposits and in the specialized techniques for geochemical prospecting for such deposits. Of special importance in this geological training will be to establish the characteristics of the geological environment of these known deposits in order that the same criteria may be used in selecting other regions of Brazil for prospecting for marine phosphorites.

Project Targets

To accomplish the objectives of phosphate evaluation in Northeast Brazil, the following targets are established:

1) Map, geologically, in detail, the Cretaceous marine phosphorite deposits in the vicinity of Recife, to establish the geological environment of deposition and etratigraphic position of the phosphate deposits as a means for laying sound groundwork for undertaking mapping in other areas.

2) Undertake geological reconnaissance of possible phosphate-bearing areas north and south of Recife and map those areas that appear to have a potential as a source of phosphate rock.

3) Undertake a geological and geochemical reconnaissance of all coastal areas of NE Brazil that have Cretaceous rocks in order to determine the existance of phosphate deposits in these areas.

4) Map, evaluate or appraise the newly discovered phosphate locations in Jatobá basin in western Pernambuco state.

5) Establish guidelines for geological and geochemical prospecting for phosphate as a means of stimulating private prospecting for these deposits in both the coastal areas as well as in the Jatobá basin.

6) Publish geological reports and maps on all field and laboratory investigations undertaken under the terms of this project.

The Course of Action

To accomplish the objectives and targets of the Phosphate Project the AID loan will finance the costs of:

1) Assigning two USGS Geologists, specialists in all phases of geological investigation of phosphate deposits, to work in the Coastal areas of northeast Brazil and the Jatobá Basin of western Pernambuco.

2) Providing one-man-year of temporary advisory services for specialists of the USGS or other agency to lend assistance in problems relating to phosphate development in NE Brazil.

3) Training six Brazilian geologists in modern geological and geochemical techniques of field and laboratory investigations and mapping of phosphate deposits.

4) Providing 8 man-years of participant training in the U.S. to include in-service training with USGS field and laboratory investigations, mining geology aspects of phosphate mining; and academic training, as appropriate, in U.S. Universities, with emphasis of the study of sedimentary mineral deposits and the mineralogy and petrography of sedimentary ores.

5) Providing aerial photographs of the coastal area of northeast Brazil and the Jatobá Basin, and compilation of base maps of these regions at appropriate scales for use in geological mapping.

6) Providing all field equipment, instruments and spare parts, including such geophysical and geochemical instrumentation as will be required for field investigations.

7) Purchasing a special truck-mounted sugar drill for shallow hole drilling to delimit the phosphate beds in select areas. This drill to be available for use in those areas where conventional drills of the DNPM cannot

provide timely or desired results.

8) Providing four field vehicles for field investigations in both the coastal areas of the project as well as in western Pernambuco.

The GOB will:

1) Assign one senior DNPM geologist as principal counterpart and 8 or more young geologists from DNPM staff to undertake geological investigations with the USGS geologists.

2) Provide adequate administrative support to project field and laboratory operations, including administrative and clerical personnel, drivers, drillers, field assistants and maintenance personnel.

3) Provide laboratory services in analytical chemistry and mineralogy and petrography as a means of complementing field investigations and provide cartographic services to support map preparation needs for the project.

4) Establish project headquarters with the Recife regional office of the DNPM.

DNPM-4

PHOSPHATE PROJECT BUDGET
(In thousands)

	FY 1968	FY 1969	Totals
1. A.I.D. Dollar Disbursements			
LOAN			
Technicians (2 USGS Full-time)	52	52	104
International travel & transp. of HHE	10	10	20
USGS Tech/Admin. Support (Lab services, report & map publication, TDY specialists)	18	18	36
Participants Training in the U.S.A. (Observation, in-service, academic training, int'l travel cost)	-	62	62
Commodities (Specialized drilling, lab/ scientific equipment	50	20	70
Sub-Totals:	130	162	292
2. Cruzeiro Costs in Dollar Equivalent			
LOAN			
Commodities (Local procurement for field vehicles, field equipment, lab. equip. and supplies, etc.)		10	10
Other Costs (Contract serv. for aerial photography, helicopter serv., base map compilation/reproduction services, etc)		20	20
Sub-Totals:		30	30
Total Loan Funding :	130	192	322
3. GOB (DNPM) Direct Funding (Cruzeiro costs in dollar equivalent)			
Salaries, Personnel Benefits, etc.	68	68	136
All other expenses for field, office and laboratory operations	108	68	176
Total GOB Direct Funding:	176	136	312

5. DNP-5 - GROUND WATER PROJECT

Introduction

The project will be financed through A.I.D. loan funds of $308,000 and GOB budgetary funding of Cr$3,045,000,000 (equivalent to $1,384,000). Seven man years of USGS specialists will be required during the two year duration of the project.

This project will train geologists in modern hydrologic work while appraising ground-water resources of selected areas. The project is not new to Northeast Brazil, having functioned since mid-1963 with the Superintendência do Desenvolvimento do Nordeste (SUDENE) as the counterpart agency. To June 30, 1967, A.I.D. will have provided 9-1/2 man years in technical services, at a cost of approximately $138,000, and in addition $8,000 for commodities and $51,000 for the training of Brazilian hydrogeologists in the United States. The agreement with SUDENE was to run until June 15, 1968, but with the termination of Grant funding in sight, it will end by June 30, 1967. The current SUDENE project originated with a DNPM proposal in 1961 that USAID and DNPM cooperate on investigations of ground water in the Northeast. A geologist was assigned on temporary duty to appraise the possibilities and to suggest a plan of operation. The emergence of SUDENE as a dominant agency in development and planning implementation in the Northeast led to establishing working arrangements with that agency, rather than with DNPM.

Attempts to improve the availability of water by constructing dams and wells date back to the early years of the present century, if not before. The fore-runner of the Departamento Nacional de Obras Contra as Sêcas (DNOCS) began about 1910 to collect geographic, geologic, and hydrologic data, and this agency subsequently has built many dams and has drilled as many as 10,000 wells. Other governmental agencies later sought to solve some parts of the water problem. Among them are the Comissão do Vale do São Francisco (CVSF); Superintendência do Desenvolvimento do Nordeste (SUDENE), and its well-drilling

subsidiary, Companhia Nordestina de Sondagens e Perfurações (CONESP); the Fundação de Serviço Especial de Saúde Pública (FSESP); the Divisão de Fomento of the DNPM; the First Group, Army Engineers; and State agencies, such as ECOSAMA (Bahia), Departamento Estadual de Poços e Acudagem (DEPA - Pernambuco), Companhia de Águas e Solos (CASOL - Rio Grande do Norte), and the Ceará Department of Mines.

Most of the effort of these various agencies has been directed right at the heart of the problem. They have sought to alleviate the shortage of water by (a) constructing dams to impound streams, or (b) drilling wells to make ground water available where there is no possibility of obtaining surface water. They have usually been impelled by a sence of urgency that has precluded the establishment of a factual basis for the work to be done, and has led inevitably to undertaking some projects that were doomed to failure. Not since about 1920 has DNOCS engaged in the kind of scientific investagation that characterized its first decade. Only since 1960 have SUDENE, and since 1963 CONESP and the Divisão de Fomento of the DNPM, sought to apply geologic criteria to the selection of well sites and to the drilling of wells. Only since 1963 has the Division of Hydrogeology of SUDENE concentrated its efforts on hydrologic investigation as contrasted with water development.

Foreign assistance to Brazil on water resources dates back to about 1954, when the United Nations sent one hydrologist. The United Nations have had hydrologists in Brazil most of the time until January 1966. France has helped through the French Technical Assistance Program. Currently, there are two French technicians working with SUDENE's Divisão de Hidrologia to train professional and semi-professional personnel through a Basin School of Hydrology. Israel has provided assistance, mainly in well development to the State of Rio Grande do Norte. USAID has worked with SUDENE since the signing, on April 30, 1964, of a Project Agreement for ground-water investigations. USAID has also provided assistance of another type through the services of two well-drilling advisors one of them headquartered in Fortaleza and the other in Recife. These men have worked with CONESP, ECOSAMA, and DNOCS dilling crews. West Germany has offered, and Brazil has accepted, assistance in hydrology which may be initiated soon.

Purpose and Importance

The ground-water project will be part of the Ten-Year Master Plan to Evaluate the Mineral Resources of Brazil, 1965-74. The purpose of this project is to strengthen and support the Divisão de Fomento of the DNPM by providing practical training for its newly hired geologists and the guidance of an experienced well driller for its well-drilling crews. At the same time, appraisal of ground-water resources will be made in selected areas, but it is not anticipated that the whole Northeast will be covered. The A.I.D.-assisted effort will be directed chiefly at the research aspect of the DNPM's work, and to the dissemination of basic hydrogeologic data usable by the public.

The objectives of the Divisão de Fomento are to conduct research, test drilling, and development of ground water in select semi-arid areas of the country, especially in the Northeast, and to promote the utilization of ground-water resources through an intensive program of drilling and equipping wells intended for supplying water for both the public and irrigation. At the same time, the Divisão de Fomento will collect, catalog, and analyze the geo-hydrology data resulting from its well-drilling operations or obtained from other sources. Suitably interpreted and published, these data will become the basis for future water development. This drilling and publication of data effort will be carefully coordinated with the ground-water activities carried out by SUDENE and other agencies in the Northeast.

Water supply has long been a problem to the residents of Northeast Brazil. It makes itself felt in crop failures, which periodically drive part of the rural population to seek work temporarily in the cities. It is felt, also, in the limitations imposed by the probable rainfall. Only crops that can survive to maturity on the normal amount of rain are worth planning. Those requiring more mean too big a risk.

The DNPM program is important to the continued growth, prosperity, and development of the Northeast because water is essential to life. People cannot live, and cattle and crops cannot live and grow, where it is lacking. The amount and chemical quality of the available water determine, to a large degree, the kind and extent of the development, whether agricultural, industrial or commercial, that can be carried

out in a region. The DNPM effort to improve the availability of the water supply, therefore, is fundamental to the welfare of the region.

A.I.D.'s technical assistance will make the DNPM's work more effective. In short, A.I.D. will be helping the DNPM to accomplish more useful work at a lower unit cost than would otherwise be possible, and it will contribute to knowledge of ground water, providing a basis on which agriculture and other enterprise can go forward.

The project is of 2-year duration and is to be undertaken jointly by the DNPM and USGS. It will have two segments: hydrology reaearch and training; and a well drilling program. It will require the services of two USGS hydrogeologists and one expert well driller for 2 years, and one expert in reverse circulation rotary drilling for 6 to 12 months. It will require from DNPM 12 or 14 geologists and supporting personnel. It will provide training in hydrogeology in the United States, for selected Brazilian personnel.

Three types of ground water investigation will be undertaken. These are: rapid reconnaissance, thorugh reconnaissance, and intensive investigation. They are described below:

Rapid reconnaissance: Localities having relatively small water requirements or relatively little ground-water, or large areas of unknown potential, can be covered by rapid reconnaissance. These include localities where the level of economic development probably can be raised only slightly by improving the utilization of available water resources. Chief reliance for detailed geologic mapping is on existing small scale geologic maps. Principal rock types are identified but intensive field mapping of all geologic formations cannot be undertaken. Records of representative wells and spring will be collected, but a complete inventory thereof is not to be attempted. Samples will be collected from representative water sources and analyzed chemically. No test drilling is to be done. Tests by pumping from wells under controlled conditions are made only opportunely, and

therefore infrequently. Such tests generally will yield information on the specific capabities of wells rather than the hydraulic properties of aquifers. The resulting reports will be informative but brief.

Rapid reconnaissance of ground water is being carried out by SUDENE's Division of Hydrogeology in a plan scheduled to run 3 to 5 years. Under this plan, teams of 2 or 3 men each are assigned to appraise the ground water potential of quadrangles of the 1:500,000 map series. Work is under way in quadrangles east of longitude 42° W and north of latitude 12° S. DNPM's work in this area will be either through reconnaissance or intensive investigation, in order to avoid duplication and will start from the base already laid by SUDENE.

Thorough reconnaissance: Localities having somewhat greater water requirements or somewhat greater ground-water potential than those described above are done by thorough reconnaissance. These are localities where a fairly significant impact on the level of economic development may be achieved by improving the utilization of ground water. Geological mapping of the more promising aquifers is done as necessary, but the less promising formations are handled as in rapid reconnaissance. The well and spring inventory and the water sampling are more thorough than in rapid reconnaissance, but not complete. Limited exploratory drilling is done and in favorable circumstances one or more aquifer tests will be made. The report is more quantitative than that resulting from a rapid reconnaissance to the extent that data are more complet and lend themselves to quantitative interpretation. The report however, is brief.

Intensive investigation: Localities of moderate to great need of water or considerable ground water potential receive intensive investigation. These are localities where a substantial impact on the level of economic development may be achieved through improving the utilization of ground water. Each phase of investigation is more thorough than in the rapid and thorough reconnaissance types of

investigation, but the quantitative phase, especially is stressed. This means that exploration drilling and aquifer testing are major parts of the effort and that considerable time is required for carrying out an investigation. The report is more elaborate than those for reconnaissance investigations.

Project Targets

The targets to be achieved within the two-year term of this project are:

1. To complete ground water studies of a structural basin in the central portion of the State of Bahia, including portions of the Itapicuru, Vasa Barris and Pombal river valleys.

2. To complete the in-service training of at least four geologists and six or more technicians in well drilling, in all phases of ground water investigations of the area selected.

3. To extend and refine knowledge of ground-water resources into areas adjacent to that studied.

4. To establish modern methods of recognition and application of the use of ground water in irrigation.

5. To introduce into Brazil the reverse-circulation hydraulic-rotary drilling equipment.

6. To produce reports for publication on all technical activities of the project.

The Divisão de Fomento now has in NE Brazil only two geologists on its staff but expects to have a dozen more by March 1967. The new geologists will be inexperienced recent graduates. To train these new-comers in the techniques and philosophy of modern ground water investigation, it is proposed that they shall work with two experienced USGS hydrogeologists, who will teach through frquent and at times protracted visits to field locations, and will ensure that the work is productive. Two qualified personnel will be given hydrogeologic training in the United States during the second year of the project.

The Divisão de Fomento now has 14 percussion drills and 3 rotary drills in NE Brazil. It intends to obtain a reverse-circulation rotary drill under the terms of this agreement. It has drillers but needs supervisory personnel capable of ensuring steady productive work from all machines and crews. This means a "tool pusher", in the terminology of the trade. An American tool pusher would provide this coordinative function while training Brazilians in the work.

The reverse-circulation rotary hydraulic drill will be new to the well-drilling business in Brazil. The machine is more expensive than the percussion and rotary drills used heretofore, and should be kept busy if it is to pay for itself. It requires drilling techniques and skills so far not known in Brazil. To train Brazilian drillers in its use, an experienced American driller will be needed full-time with this drill for 6 to 12 months starting from the delivery of the drill.

The reports produced for publication will include illustrated by maps, cross-sections, and diagrams, on the areas investigated, or on related subjects.

Course of Action

To achieve the goals of this project the following course of action will be undertaken.

The A.I.D. loan will finance the costs of:

1. Assigning the ground water specialists from the staff of the USGS, one full-time drilling specialist in ground water investigations and one part-time (TDY) specialist (6 to 12 months) in the use of a reverse-circulation rotary hydraulic drill.

2. Providing participant training in the U.S. for four or more geologists, with the USGS in ground water investigative activities. Such training to be undertaken only on completion of this project.

3. Providing one vehicle for each of the two USGS geologists and field party and such other transportation as is necessary to maintain effective, productive field operations.

4. Purchasing the reverse-circulation hydraulic-rotary drill for use in project operations.

GOB will:

1. Assign one senior Brazilian engineer or geologist who will be the senior counterpart of the project, four or more geologists from the staff of the DNPM; and as many drilling engineers or technicians from the rolls of the DNPM as may be required to maintain in efficient operation all drilling equipment to be used.

2. The DNPM will provide such maintenance and operating expenses as are required to provide sustained service of all field equipment, vehicles, drills and accessory equipment.

3. Establish headquarters of the project in the regional office of the DNPM in Recife.

4. Review and refine DNPM plans for both hydrogeological research and ground-water development, along the following lines:

   A. Selection and delimitation of the basin in Bahia where irrigation by wells appears to be feasible, and elaboration of the plans and arrangements for demonstrating that ground water in sufficient quantity and satisfactory quality for irrigation is present. In this area an intensive investigation will be contemplated, covering the following aspects of geohydrology:

      1) Mapping and measuring of the geology formations and determination of their structure.

2) Inventorying wells, including measurements of depth to water and well discharge; and the collecting of drillers' logs of wells.

3) Inventorying springs, including measurements of their discharge.

4) Determining altitudes of wells and springs so that the water levels be related to each other in a piezometric map.

5) Periodic measuring of water levels to determine water-level fluctuations.

6) Test drilling to verify and to extend the available data on the thickness, character, and distribution of rock formations and on the occurrence.

7) Test pumping to determine the hydraulic properties of aquifers.

8) Sampling and chemical analysis of water.

9) Collecting data on precipitation, and on streamflow, for use in analyzing the hydraulic system. These data normally are obtained from the files or the printed reports of the government agencies responsible for making the corresponding measurements.

D. Determine which other area or areas should and can be investigated in a similar but less intensive manner than that suggested above with the available money, manpower, and equipment.

DNPM-5

GROUND WATER PROJECT BUDGET
(in thousands)

1. A.I.D. Dollar Disbursements:

LOAN

	FY 1968	FY 1969	Totals
Technicians (2 USGS full-time)	52	62	114
Technician (Expert well-drilling Supv. Direct Hire or Contract)		16	16
International travel & transp. of HHE	10	15	25
USGS Tech/Admin.Support (Lab services, report/map prepar. publication, TDY spec.)	18	18	36
Participant Training in the USA (In-services & academic) includes per diem and international tvl, tuition, books, costs.	-	16	16
Commodities (Specialized, scientific for field & laboratory operations)	81		81
Sub-Totals:	161	127	288

2. Cruzeiro Costs in Dollar Equiv.

LOAN

Commodities (Local procurement for field vehicles, field equipment, lab.equipment & supplies in support of operations,		10	10
Other Costs (Contract Services for aerial photography, helicopter services, base map, compilation & reproduction services, etc.)		10	10
Sub-Totals:		20	20
Total Loan Funding:	161	147	308

3. GOB Direct Funding (Cruzeiro costs in dollar equiv.)

Salaries, Personnel Benefits, etc.	341	341	682
All other expenses for field, office, and laboratory operations	361	341	702
Total GOB Direct Funding:	702	682	1,384

B. DEPARTAMENTO NACIONAL DE ÁGUAS E ENERGIA

1. DNAE-1 - HYDROLOGIC DATA COLLECTION

Introduction

During the five year duration of this project AID loan funds of $1,565,000 and GOB budgetary funding of Cr$8,810,000,000 (equivalent to $4,009,000) will be required.

Hydrologic data, especially streamflow data, is a necessary pre-requisite for the proper planning and design of water resources development projects and for water control. Streamflow data, including average and total, daily, monthly, and annual discharge, flood discharges and minimum flows, are needed for the planning and design of hydroelectric, irrigation, flood control and navigation projects, and for industrial and municipal water supply, as well as for their operation. The size of a project, spillway capacities, upon which the safety of a dam depends, the area to be irrigated, etc., are based on the available data and its extrapolation, or correlation with rainfall data. The basic data programs will continue indefinitely in Brazil, just as they will in other countries, as the value of the data is realized and used for planning and design. The DNAE of the Ministry of Mines and Energy is responsible for hydrologic data collection throughout Brazil and is now starting to expand its activities to the two-thirds of Brazil that has only meager hydrologic data to obtain the data for all water-use planning in Brazil.

Purpose and Importance

The purpose of the project is to increase the institutional effectiveness and technical know-how of the hydrology operations of the newly created DNAE. The upgraded agency is committed to carrying out its responsibilities on a national scale, whereas, prior to 1965, it had operated largely in the southeastern one-fifth of

Brazil. It now has offices installed in Goiânia, Belém, Manáus and Cuiabá, in order to expand and improve its operations and services. Its operating funds have been increased from Cr$1.2 billion in 1965 to Cr$ 3.5 billion for 1967. Large special-purpose river craft have been constructed for streamflow investigations. New streamflow and other hydrologic stations are being established to meet national planning and international commitments - the DNAE is taking an active part in the International Decade of Hydrology and is embarked on a program to obtain hydrologic data in the vast, ungaged areas of Brazil in order to expand the global knowledge of hydrology in the country.

New training activities have been initiated, centered in Belo Horizonte, and the agency's control offices and district chiefs hold frequent seminars to standardize their activities.

Streamflow investigations were begun in Brazil about 1910 and have been carried on by several agencies, primarily in the southeastern region from Bahia to Rio Grande do Sul. Some streamflow data has been collected in the Northeast, but data is almost non-existant for the remaining two-thirds of the country. The northeast and southeast are well covered with rainfall stations at present, many of which have been established since 1962. Rainfall data are available in only a few locations in the other sections of Brazil. Among the parties involved in various degrees in hydrologic data collection are the DNAE; DNOS (Departamento Nacional de Obras e Saneamento); SUDENE (Superintendency for the Development of the Northeast) in cooperation with DNOCS (Departamento Nacional de Obras Contra as Sêcas); several state-controlled electric power corporations and several private consulting firms for various federal, state and private entities. There has been little coordination in the hydrologic data collection programs; data necessary for planning purposes is difficult to locate; records have usually not been computed and compiled or published until needed for a project study,

and are therefore not available in usable form; one agency may not be aware of what another is doing or what is available, which results in duplication of effort. It will be the task of the DNAE director general to coordinate the establishment of systematic record-keeping and improvement of methods.

The enormous water supply of Brazil, with its potential to provide hundreds of millions of kilowatts of power, to irrigate millions of hectares of water-short land, to expand inland navigation, to provide for flood control and for public and industrial water supply and pollution control, depends on the availability of adequate hydrologic information for proper planning and design. An expenditure of $10,000 in streamflow research can result in a saving of $10,000,000 when building a hydroelectric plant. The huge capital investments necessary in water resources development demand the best in hydrologic research. The GOB has selected the DNAE as the agency best suited to provide hydrologic research on a national scale.

Project Targets

The following are the targets for the five year term of the hydrologic Data Collection project:

1. Establish, at a high level of standards, a national network of hydrologic stations, improve the operations of existing stations, and to publish basic data for national planning of water resources development.

2. Equip the DNAE with such equipment as is needed for establishing, on a single standard of operation, its national network of hydrologic stations.

3. Train a cadre of hydrologic personnel to man all positions planned in the completion of the national network of hydrologic stations.

4. By the completion date of the project, raise the number of stream-gaging stations from 1100 at present to 1500; rainfall stations from about 1500 to 3000 and to establish 100 water evaporations stations.

5. Install recording equipment at 300 streamflow and 300 rainfall stations.

6. Publish reports on all phases of the project, on its completion.

Course of Action

The AID loan will finance the costs of:

1. Assigning three hydrologists from the staff of the USGS who have ample experience in organization and execution of hydrologic programs on a national scale. The USGS specialists will advise, assist and recommend means of improvement of practises and procedures in field and office activities and in organization and purchase of equipment, and to improve efficiency of operations and reliability of information.

2. Providing in-service training in all phases of operation to all Brazilian personnel assigned to the project.

3. Providing training in the U.S. for about 36 weeks each to an average of six key personnel for year, with shorter periods for some officials for organizational and management procedures training.

4. Training specialized personnel in computation and compilation techniques of all data in accumulation or to be gathered.

5. Through dollar expenditure in the U.S. or through dollar converted to cruzeiro expenditure in Brazil, procure (in the U.S. or Brazil) such services and equipment, including additional field vehicles, needed to establish and improve all stream-gaging, rainfall and evaporation stations in the country under the terms of this agreement.

The GOB will:

1. Assign one senior Brazilian engineer as principal counterpart to each U.S. specialist and three or more Brazilian junior engineers or specialists who will work on a fulltime basis in the organization and implementation of all phases of the project objectives and targets.

2. Compute, compile and publish five thousand station-years of back streamflow data, as well as rainfall and other uncompiled data. Computation and compilation to be accomplished if necessary by subcontractors providing modern computer service techniques.

3. Equip a station in a small hydrologic basin with recording instrumentation to be used as a training and demonstration center.

4. Provide project operations with all essential field, office and laboratory equipment and services, including administrative and field personnel; radio-communications with all district headquarters and principal centers of field operations; field vehicles for use of personnel engaged in carrying out the terms of this project, and the payment of maintenance and operating costs of these vehicles.

5. Provide cartographic and printing services for the publication of all reports resulting from project operations.

Progress to Date

In hydrologic data collection, the USGS has furnished technical advisors since January 1963. This assistance was extended to the Northeast (SUDENE). One advisor served from January 1963 to October 1965 for the overall data collection and operations program under which procedures and practices were established, equipment supplied and

installation begun. A second advisor, from April 1964 to June 1966, concentrated on the computation and compilation of a back-log of 1100 station-years of streamflow data and 30,000 station-years of rainfall data extending back to about 1910. This has now been completed but is still unpublished; data is now computed currently to avoid such backlogs. A 3-month detail of another advisor assisted, in 1965, the computation program. Since August 1966, an advisor has been assisting in the Northeast program to further increase reliability and efficiency. Commodities totalling $103,000 have been supplied to the NE program. The present chief of the SUDENE Division of Hydrology has returned from an 8-months training in the U.S.

Direct assistance to DNAE, beginning in early 1966, consisted largely of advisory services in organization, definition of responsibilities, functions and goals.

DNAE-1

HYDROLOGIC DATA COLLECTION AND ANALYSES PROJECT BUDGET
(In thousands)

	FY 1968	FY 1969	FY 1970	FY 1971	FY 1972	Totals
1. AID Dollar Disbursements: LOAN						
Technicians (3 USGS Full-time)	78	78	78	52	-	286
International travel & transp. of HHE	10	15	15	10	-	50
USGS Tech/Admin.Support (Lab services, report/map prep. publication, TDY spec.)	18	31	18	26	-	93
Participant Training in the USA (In-service & academic) Includes per diem and international tvl, tuition, books, costs.	30	37	41	41	16	165
Commodities (specialized,scientific for field & laboratory operations)	90	85	70	65	36	346
Sub-Totals:	226	246	222	194	52	940
2. Cruzeiro Costs in Dollar Equiv. LOAN						
Commodities (Local procurement for field vehicles, field equipment, lab. equipment & supplies in support of operations)		195	175	155	100	625
Sub-Totals:		195	175	155	100	625
Total Loan Funding :	226	441	397	349	152	1,565
3. GOB Direct Funding (Cruzeiro costs in dollar equiv.						
Salaries, Personnel Benefits, etc.	341	363	381	414	431	1,930
All other expenses for field, office laboratory operations and contract services	486	364	382	414	432	2,079
Total GOB Direct Funding:	827	727	763	828	863	4,009

2. DNAE-2 PHOTOGRAMMETRIC SERVICE

Introduction

During the five year duration of this project AID loan funds of $1,430,000 and GOB budgetary funding of Cr$2,000,000,000 (equivalent to $909,090) will be required.

The Departamento Nacional de Águas e Energia (DNAE) was established in early 1966, combining in one department various government activities and regulatory services in water and power development. Among the activities incorporated was the Divisão de Águas of the Departamento Nacional da Produção Mineral and the Photogrammetric Service attached to it.

The Photogrammetric Service has been in operation for more than thirty years as a mapping service. It has a fleet of five aircraft, and its own hangar and maintenance facilities near Rio de Janeiro. The oldest aircraft is 30 years old and still in good flying condition, which testifies to the grade of maintenance. Available are aerial cameras, photo-processing, stereoplotting and interpretation equipment, all located at DNAE headquarters in Rio. Part of this equipment is of Swiss and part of American manufacture. Standardization of such of this equipment is desirable, but not indispensable. The grade of topographic maps produced is good, with very fine detail for use in water development studies. Some of the personnel have been with the Service for more than 25 years and all are dedicated to their work. Present aircraft do not have altitude capability; instrumentation for modern photography is needed and old cameras should be replaced. Up-grading of certain stereoplotting and interpretation equipment is required.

Purpose and Importance

The DNAE has been given the authority as a regulatory agency of the Federal Government to plan, establish and

carry out programs in hydrological and water power development in the country. To fulfill its responsibilities for developing hydrology and water power development studies in Brazil, the DNAE must have as a technical arm a service that will produce the needed base maps of a great variety suited to the particular plans of a hydrological basin study, a land development project or an electric power development plan. The service plans to develop to fill this basis technological need is its Photogrammetric Service. This Service was transferred along with then Divisão de Águas of the Departamento Nacional da Produção Mineral (DNPM) to the DNAE when this agency was organized. In existence for many years as a service of the DNPM, where its scale of activity was commensurate with the responsibility of the agency to which it was attached, the Photogrammetric Service now finds itself in a position of having to greatly increase its activities and production and to perform a manifold function in the production of topographic base maps at large scales as well as photo-interpretation of special land forms and features.

The Service's present annual rate of map production by photogrammetric techniques is 5,000 to 8,000 square kilometers of territory at scales of 1:25,000 or larger. The plan of the DNAE for national coverage of hydrological studies of basins and for water power development for the next 20 years calls for the preparation of maps of about 1,000,000 square kilometers of territory in specially selected areas. The DNAE plans for the Photogrammetric Service now call for increase in the rate of production of maps to about 50,000 square kilometers per year. Such an increase in map preparation capacity requires that the Service increase its staff of trained personnel as well as the instrumentation for map preparation, and to modernize its small fleet of aircraft needed to supply special scale air photography for map compilation.

Photogrammetric services are available in Brazil in the civil and military branch of government as well as in the private sector. Such services are of good quality

although production schedules are slow in government operations. The Conselho Nacional de Geografia received for several years technical assistance from USAID in establishing a national program of production of general purpose base maps at scales of 1:1,000,000, 1:250,000, and 1:100,000, not suitable for the needs of detailed work carried on by the DNAE staff.

There are three commercial companies in Rio that provide good quality general purpose maps compiled through photogrammetric techniques and they can undoubtedly supplement the needs of the DNAE Photogrammetric Service as it develops its plans towards the 20 year goal of special purpose mapping of large areas of the territory of Brazil. The Photogrammetric Services activities do not overlap those of government and private sector services because the DNAE mapping requirements are specialized, requiring the backstopping, guidance and orientation of hydrologists and other special engineering talents to achieve maps to support sound planning in water and power development. The DNAE mapping will produce valuable information that can be used in programs of irrigation, land development, soils, agriculture, minerals, geology and hydrogeology and will need to be coordinated with other national resources mapping programs. This coordination can be achieved by press release for general public information. USGS advisers will provide assistance in coordinating mapping programs.

Project Targets

1) Equip the Photogrammetric Service of DNAE with the photographic and scientific equipment necessary to carry out the needed mapping functions for a national hydrologic and power development program.

2) Establish a cadre of 40 well trained photogrammetrists in the Service capable of rapid and accurate compilation of high standard special purpose, large scale maps.

3) Establish a production rate for the Section, of about 50,000 square kilometers per year of large scale mapping (1:25,000 or less).

The Course of Action

The A.I.D. Loan will finance the costs of:

1) Assigning three Photogrammetric and photo-interpretation specialists from the staff of the USGS for a total of ten man-years of assistance to the project.

2) Providing participant training in the USGS facilities in the U.S. to at least eight persons per year, in such specialities as serial photography, photo-laboratory, photo and map restitution, photo interpretation and horizontal and vertical control. Such training may also be carried out at the facilities of the Inter-American Geodetic Survey in Panama, so as not to require English language proficiency.

3) Procuring approximately $870,000 of new equipment, including two new aircraft, cameras, stereo-plotting equipment to be provided in the three initial years of the project.

GOB will:

1) Establish map production schedules to meet the target rate of 50,000 square kilometers of mapping per year.

2) Assign specially selected trainees to the Service at the rate of at least ten additional candidates per year for 5 years in order to train, develop and establish a capable staff of photogrammetric technicians.

DNAE-2

PHOTOGRAMMETRY PROJECT BUDGET
(In thousands)

1. AID Dollar Disbursements:
LOAN

	FY 1968	FY 1969	FY 1970	FY 1971	FY 1972	Total
Technicians (10 man years USGS Topo) Salaries, plus pers. benefits, (retirement, insurance, etc)	36	78	76	52	39	281
International travel & transp. of HHE	10	5	15	5	10	45
USGS Tech/Admin.Support (Lab services, report/map prep. publication, TDY spec.)	17	23	23	17	18	98
Participant Training in the USA (In-service & academic) Includes per diem and international tvl, tuition, books, costs	17	30	30	30	26	133
Commodities (Specialized, scientific for field & laboratory operations)	246	167	310	100	50	873
Total Loan Funding:	326	303	454	204	143	1,430

2. GOB Direct Funding (Cruzeiros cost in dollar equivalent)

Salaries, Personnel Benefits, etc.	45	68	91	114	137	455
All other expenses for field, office, and laboratory operations and other commodity requirements	46	68	91	113	136	454
Total GOB Direct Funding:	91	136	182	227	273	909

3. DNAE-3 - COMBINED TARIFFS, LICENSES, STATISTICAL AND ADMINISTRATION SERVICES

Introduction

During the first year duration of the project, A.I.D. loan funds of $182,000 and GOB budgetary funding of Cr$1,272,000,000 (equivalent to $578,000) will be required.

Law No. 4904 of 17 December 1965 revised the organization of the Ministry of Mines and Energy elevating the former Division of Water of the Departamento Nacional de Produção Mineral to the level of a department, as the new National Department of Water and Energy (DNAE). In the change, several regulatory services of the GOB were also incorporated into the DNAE. The DNAE is composed of the Division of Water, the Division of Electrical Energy and Concessions, the Division of Tariffs, the Statistical Service, and the Photogrammetic Service. The law set up a new organizational framework and increased the agency's responsibilities in licensing, regulating, and coordinating water and power utilizations. It also confirmed and reinforced the DNAE's nation-wide responsibility and authority in these fields.

The changeover to Departmental status led to a critical examination of technical procedures and management methods which had been in effect for many years. As a result, it was determined that technical and administrative modernization was an indispensable requisite to the efficient and economical discharging of increased responsibilities. Technical assistance, providing on-the-job practical training in the United States and in Brazil by U.S. agencies with long experience in the specific DNAE areas of interest, was the logical response to the DNAE's training needs.

Purpose of Importance

The purpose of this project is to improve the performance of several key units of the DNAE. Assistance will be provided through procurement of advanced equipment for data processing and control, and in personnel training.

The DNAE units involved are long-established units, which have recently been reorganized and redirected, namely the Division of Tariffs, the Division of Electric Energy and Concessions, the Statistical Service, and the Administrative Section. Their enlarged staffs will benefit from training in rate studies, benefit-cost ratios, power dispatching, power transmission, interconnection, licensing and water rights law, statistical control including computer methods, and administration and management.

As the production of power increases and the development of Brazil increases, especially in the interior, the work load of these units increases in size and complexity. For example, in 1965 the Secção de Energia Hidráulica received 290 projects to evaluate and review which totalled over three million kilowatts; the Secção de Concessões prepared 96 reports or replies for licenses for power distribution, 44 for thermoelectric plants, ten for hydroelectric plants, 24 transfers of license rights, and others to increase, decrease, or otherwise affect power and water in Brazil; the Secção de Fiscalização e Estatísticas processed about 5,300 entries of files of surveys and inspections of electrical installations of municipal, industrial, and other private interests, as well as administrative acts, requests for rate increases, complaints, and other matters. The reorganization of DNAE has increased the responsibilities and up-graded some Sections to Divisions; the work-load in all phases is increasing with the increasing power development and electrification in the country.

Project Targets

1. Modernize the organization, methods and procedures in regulating and coordinating power and water resources development on a national scale of the Division of Tariffs, the Division of Electric Energy and Concessions, the Statistical Service and the Administrative Section of the DNAE.

2. Establish modern data processing and statistical control methods in the above named divisions.

3. Train personnel in all phases of operation of the above named divisions.

Course of Action

The course of action required to achive objectives is largely through sending participants to the U.S. for periods of training with appropriate agencies of the U.S. Government.

The A.I.D. loan will finance the costs of:

1. Training in the U.S. of four to six months duration for four (4) persons per year from the Division of Tarrifs, with the Federal Power Commission, the Tennessee Valley Authority, and other power agencies, in power rate structure, benefit-cost ratio, distribution costs, rural electrification and related studies.

2. Short term training in the U.S. for 15 persons from the Division of Electric Energy and Concessions in power licensing, water rights, detection of conflict of interests, and related fields with the Federal Power Commission, the Tennessee Valley authority, the Bureau of Reclamation, the Department of the Interior Solicitor's Office and with State agencies.

3. Provide four months training in the U.S. for each of 4 participants from the Statistical Service, in power statistics and control.

4. Provide the Statistical Service with six-months services of a U.S. specialist in statistical analyses studies of large electrical operations.

5. Purchase for the Statistical Service, in the U.S. or in Brazil, statistical computer equipment at a cost of $10,000.

6. Provide training in the U.S. for five participants from the Administration Section, each of six months duration, in administration and management with appropriate U.S. agencies.

GOB will:

1. Pay all GOB personnel costs and all other expenses for field, office and laboratory operations.

DNAE-3

COMBINED SERVICES PROJECT BUDGET
(In thousands)

	FY 1968	FY 1969	FY 1970	FY 1971	FY 1972	TOTALS
1. AID Dollar Disbursements: LOAN						
Technicians (6 mos.detail of FPC or TVA Statistical Expert)	14	-	-	-	-	14
International travel and per diem	8	-	-	-	-	8
Participant Training in the USA (In-service & academic) Includes per diem and international tvl, tuition, books, costs.	25	29	56	23	27	160
Sub-Totals:	47	29	56	23	27	182
2. Cruzeiro Costs in Dollar Equiv. LOAN						
Commodities (Local procurement for field vehicles, field equipment, lab. equipment & supplies in support of operations)		-	-	-	-	
Sub-Totals:		-	-	-	-	
Total Loan Funding:	47	29	56	23	27	182
3. GOB Direct Funding (Cruzeiro costs in dollar equivalent)						
Salaries, Personnel Benefits, etc.	41	46	50	55	59	252
All other expenses for field, office and laboratory operations	119	45	50	54	59	326
Total GOB Direct Funding:	160	91	100	109	118	578

SECTION IV - ISSUES

A. Local Currency Financing

The full cost of the five-year Mineral and Water Resources Program will come to $20.167 million, including both dollar and cruzeiro costs (see Program Budget, page v of this paper). AID's direct dollar costs of the program will amount to $6.015 million. On the local currency side the GOB has agreed to provide, from regular budgetary sources, the equivalent of $11,861,000. This GOB contribution will be represented by (a) the salaries and other personnel costs of DNPM and DNAE technicians assigned to carry out the AID-assisted mineral and water survey and data collection activities, and (b) the expense of related field, office and laboratory operations. Local currency costs of $2.291 million for additional Brazilian-made commodities, and Brazilian contractual services are to be met from other sources. The GOB has requested that these costs be financed with the AID loan.

In the loan discussions, the Government indicated that the maximum contribution that could be made from regular budgetary sources was the $11,861,000. The size of this contribution, however, in relation to the amount of the proposed AID loan and the fact that the GOB has agreed to loan-financing of assistance formerly grant-funded argue in favor of accepting an 11 to 9 ratio of GOB-AID cost sharing.

To minimize AID dollar financing while easing the burden to be borne by regular GOB revenues, AID proposes to stipulate in the loan agreement that to the extent that other AID program-related Brazilian Government-owned local currencies become available (as a consequence of AID program assistance loans, payments received under "two-step" dollar project loans and PL 480 Title IV projects) such currencies be used to the extent feasible in lieu of AID dollars. Current estimates are that AID will be certain to have these currencies available, although 1967 Program Loan Counterpart has been totally programmed (Roads $21.6 million education and textbooks $18.5 million, intermediate credit 78 million, labor 15 million, public administration $2.2 million, CONTAP and participants $24 million, this loan $3.6 million, and $10 million reserve); PL 480 Title I cruzeiros are firmly reserved for the Mogiana Program; and PL480 Title IV cruzeiros are almost entirely allocated to the Rio-Sao Paulo Highway and to the Southern States Highway maintenance program. The remaining balance and future accruals are destined to the agricultural sector in accordance with AID's over-all present policies; there remains the two step loan interest windfall which will be available. The USAID Controller

estimates these funds as being in the order of $9.9 million in FY 68 and $18.8 million in FY 69. This computation was made by the USAID/Controller without taking into account the interest payments on loans not yet made, but expected to be approved during FY 67 and thus understates the interest payments that will actually accrue. The only claim against these funds is approximately $9 million for program support and the balance will be available for other program uses such as this loan. However, the USAID does not consider it feasible now to negotiate the future use of these funds. In the annual discussions concerning the programming of AID program-related cruzeiros, AID will strive to secure allocations for these purposes.

To assure full funding for the five-year term of the Mineral and Water Resources Program, while awaiting the accrual of other sources of cruzeiros, the AID loan must permit disbursements not to exceed $8.4 million including the full $2.291 million of local costs not otherwise met.

In the event that AID dollar financing for local costs of the Program turns out to be necessary, it is not expected that the effect on the U.S. balance of payments will be significant vis-a-vis Brazil. The financing will be spread over five years, declining from $811,000 in FY 1969 to $100,000 in FY 1972. The Special Letter of Credit procedure will be used, requiring the use of the dollars for procurement in the U.S. In addition, the cruzeiro expenditures may themselves result in dollars flowing to the U.S. Some of the Brazilian manufactured commodities may bring about increased exports of U.S. materials and component parts to Brazil. In addition, some of the items are manufactured by American subsidiaries as, for example, the computer, the field vehicles and cameras. Procurement of this type would result not only in the export of component parts to Brazil but contribute to American subsidiaries' profits for remittance to the U.S. In another category of local currency costs, contracting for aerial photography may prove to be feasible on a Brazilian-American joint venture basis. The dollar component of joint venture contracts would thus directly reduce the amount of AID local currency financing.

B. FINEP (Fundo de Financiamento de Projetos e Programmas)

In November 1965, AID authorized a loan of $11 million to FINEP which had been established by the GOB earlier that year to direct and finance pre-feasibility and feasibility studies, general surveys and sectoral, regional and other pre-investment studies in diverse fields. AID also made available 1 billion cruzeiros to finance FINEP studies conducted by Brazilian firms.

At the time AID extended its dollar loan, it was envisaged that $5 million of the loan funds would meet FINEP's needs for feasibility studies and $6 million would finance natural resource surveys of the type proposed in this paper.

For two principal reasons, however, FINEP-financing is now believed inappropriate for the Mineral and Water Resource Surveys Program. First, at present FINEP has already made, or is in the process of making, firm commitments for $9.6 million of its AID Loan, broken down as follows:

a) Meterological Survey.....$2.2 million
b) Telecommunications Study.....$1.6 million
c) Sao Paulo Master Plan.....$ .5 million
d) Taquari River Basin.....$ .5 million
e) Rio-Niteroi Bridge.....$4.0 million
f) Cosigua Port Study.....$ .6 million
g) Espirito Santo Highway.....$ .09 million
h) Para Pulp and Paper Plant.....$ .08 million

In addition to the above, FINEP is expected to finance a study expected to cost approximately $1 million of the Rio de Janeiro subway system. Thus, the FINEP loan is now almost entirely committed, or at least developed far enough so that it would result in a drastic revision of present planning if the remaining FINEP funds which are not yet formally committed were suddenly diverted to this loan. Second, the experience of FINEP has led USAID to conclude that the organization is better adapted to directing discrete studies than a program of technical assistance-oriented resource surveys and data collection activities. Separate AID financing, directly for the Ministry of Mines and Energy is believed the most effective way of achieving the dual purpose of the loan: strengthening the DNPM and DNAE as national agencies in the natural resource area and developing priority resource data.

SECTION V - IMPACT ON THE U.S. ECONOMY

Loan funds will be disbursed for U.S. goods and services directly related to the Resources Program or, if Special Letters of Credit are issued, for general Brazilian imports from the U.S. U.S. balance of payments effects are discussed in Section IV A.

Resource survey results, which will be published both in Brazil and in t e U.S. as a consequence of the loan, are expected to be of interest to potential American investors.

SECTION VI - IMPLEMENTATION

A. Program Execution

The loan agreement will be signed and conditions precedent met by July 1, 1967 when grant funding terminates for natural resource activities.

Prior to the first disbursement, the GOB will provide a detailed breakdown of the GOB's financial contribution to the Program. The breakdown will indicate the form of the contribution, timing and channels of disbursement, to assure proper accountability. In addition, the GOB will provide a detailed work plan for the first year of operation of the Program, concurred in by the USGS, covering each of the individual projects and an overall program execution schedule, preferably including critical path analysis or similar technique for setting out work plan schedules.

During the first year of operations, on the basis of experience gained, the GOB will prepare a detailed work plan for the four remaining years in a form similar to the plan for the first year of operations. This plan, also concurred in by the USGS, will be submitted to USAID not later than one month prior to the first annual program review (described below).

B. Annual Program Reviews

Program reviews, participated in by AID, USGS, USBM and the Ministry will be conducted at least once a year on or about the anniversary date of the signing of the loan agreement. These reviews will consider annual plans and schedules for the mapping, surveying, equipment procurement, training and technical assistance activities. They will also assess progress in carrying out past agreed plans. The GOB's financial support for the Program will be studied in the light of the detailed financial breakdown submitted by the Government to fulfill conditions precedent. The current GOB budget for the Program will be reviewed as well as the Ministry's request for funds for the following year. The annual meeting will also review the adequacy of AID and GOB funding for, and of the technical input into, individual projects, and on the basis of the appraisal of program activities and progress reports for the previous year, will consider expansion or contraction of activities in individual projects within the total financial availabilities for the

program. (Between annual reviews, changes or adjustments among the projects may be authorized, but in the event that such changes are "substantial", i.e. involve a change in scope or money amounts of more than ten percent -- they will require GOB, AID and USGS concurrence.)

Inasmuch as the agreed adjustments in the scope of individual activities affect the work schedule and funding of the individual projects, the Borrower will be expected, within a time limit determined at the annual review meeting, to submit for AID acceptance a revised work plan, execution schedule and funding breakdown covering both AID and GOB funding, all of which will be concurred in by the USGS.

C. Program Supervision

Technical monitoring of the program will be performed by the Office of Engineering Resources of USAID/Brazil and by the GOB Ministry of Mines and Energy. The senior geologist of the USGS team will have overall responsibility for directing USGS efforts and coordinating the work of USBM and other U.S. agency personnel. Counterparts of the senior USGS geologist will be the directors general of the DNPM and DNAE who have been given full responsibility and authority for carrying out the program. Senior GOB geologists have been designated project chiefs in charge of each of the eight individual projects. A USGS or USBM technician will be named to coordinate each of the projects and will report to the senior USGS geologist.

D. Procurement of Commodities

U.S. made equipment will be procured by the USGS, as agent for and for the account of the GOB, following normal U.S. Government procedures. The USGS Participating Agency Agreement (PASA) contract, to be approved by the GOB, will provide for USGS services as procurement agent. USGS will be reimbursed by AID/W for U.S. procurement and the loan will be charged correspondingly.

To avoid import license delays in the procurement of U.S. commodities for the program, the Brazilian authority CACEX will be expected to review and give preliminary approval to all U.S. commodities to be provided under the loan. The CACEX preliminary approval will be obtained prior to commencement of procurement procedures by the USGS in Washington.

Procurement of Brazilian equipment will follow normal GOB regulations and will be approved and certified by the senior USGS geologist. The system of payment for Brazilian commodities will depend on whether AID will be financing the procurement using Special Letter of Credit procedures or whether other sources of cruzeiros (e.g. counterpart) are made available by the GOB. If Special Letters of Credit are involved, a system of local currency payment will be worked out in advance by USGS, GOB and the USAID Controller's office. Payment for such commodities may be handled on the basis of reimbursement for submitted vouchers or a revolving fund may be established.

Excess property lists will be reviewed by USGS personnel in Brazil and the U.S. prior to undertaking procurement of either American or Brazilian commodities.

Bulk commodity procurement restrictions set forth in Sections 604 (a) and (b) of the Foreign Assistance Act will be observed for Brazilian commodities to the extent that such commodities are procured under the AID loan.

E. Contracting

The responsibilities of the USGS will be set forth in a PASA agreement between AID and the USGS, as requested by the GOB. It is anticipated that the services of U.S. Bureau of Mines, Federal Power Commission and Tennesse Valley Authority personnel will be provided for within the USGS PASA. Approval of the PASA by AID, USGS and the GOB will be required as a condition precedent to disbursement.

Contracts for other services (e.g. aerial photography) will be approved by the senior USGS geologist in Brazil and by USAID/Brazil.

F. Reporting

Reports on physical progress, including both technical and financial aspects, will be submitted by the Ministry of Mines and Energy to AID at least every three months.

Quarterly reports on shipping under the loan will also be required.

G. Participant Training

Individuals selected for participant training in the U.S. will be selected by the Ministry with the concurrence of the senior USGS geologist and the approval of USAID/Brazil. Selection will be on the basis of technical qualifications and English language training. Attention will be paid to proper phasing of on-the-job and academic training of DNPM and DNAE personnel so as to avoid disruption of the surveying and other activities being carried on under the Program. Language preparation will be scheduled to permit timely departures for the training. Appropriate commitments will be obtained from the participants to assure their return to their Ministry jobs. PIO/P documentation will be used to facilitate AID/W processing of trainees.

CHECK LIST OF STATUTORY CRITERIA

(Alliance for Progress)

1. FAA §.102. Precautions that have been or are being taken to assure that loan proceeds are not diverted to short-term emergency purposes (such as budgetary, balance of payments, or military purposes) or any other purpose not essential to the country's long-range economic development.

   USAID personnel will approve all "PIO/C's" and requests for opening letters of commitment and will assure that funds are disbursed for goods and services needed for the program.

2. FAA §.102. Information on measures taken to utilize United States Government excess personal property in lieu of the procurement of new items.

   The U.S. Geological Survey equipment specialists in Washington and Brazil will screen all equipment lists and search excess property supply depots to determine what, if any, equipment can be obtained in that manner.

3. FAA §.102. Information whether the country permits, or fails to take adequate measures to prevent, the damage or destruction by mob action of United States property.

   The Government of Brazil does not permit and takes adequate measures to prevent, the damage or destruction by mob action of United States property.

4. FAA §.201(d). Information and conclusion on legality (under laws of country and U.S.) and reasonableness of lending and relending terms of the loan.

The proposed loan is consistent with the laws of Brazil and the United States and the terms are considered reasonable by both the Borrower and A.I.D.

5. FAA §.251(a). Manner in which loan will promote country's economic development and contribute to the welfare of its people.

The loan will promote Brazil's economic development and contribute to the welfare of its people (See Section I).

6. FAA §251(b)(1). Extent to which country is adhering to the principles of the Act of Bogota and Charter of Punta del Este and is showing a responsiveness to the vital economic, political, and social concerns of its people, and extent to which country has demonstrated a clear determination to take effective self-help measures.

Account has been taken of Brazil's adherence to the principles of the Act of Bogota and the Charter of Punta del Este and is showing a responsiveness to the vital economic, political and social concerns of its p people. A full report of Brazil's efforts to comply with both the Act of Bogota and the Charter of Punta del Este is set forth in the 1967 Country Program submission.

7. FAA §.251(b)(2). Information and conclusion on activity's economic and technical soundness.

This activity has been found economically and technically sound (Sections I and III)

8. FAA §.251(b)(3). Information and conclusion on activity's relationship to and

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consistency with other development activities, and its contribution to realizable long-range objectives.

The identification of exploitable natural resources, to which this program will contribute, is related to and consistent with other development activities. Additional exploitation of minerals will provide raw materials for Brazilian industry and agriculture and make possible an increase in Brazilian mineral exports. Similarly, greater knowledge of Brazil's water resources can provide the basis for an expansion of agricultural irrigation programs and hydroelectric power production.

9. FAA §.251(b) (4). Information and conclusion on possible effects on U.S. economy, with special reference to areas of substantial labor surplus.

The major portion of the loan will be used to finance goods and services of U.S. source and origin. Also, any AID dollars for local currency financing will be made available under the Special Letter of Credit procedure requiring the expenditure of such dollars in the U.S. It is expected that some of the procurement of Brazilian goods and services for the program will result in (1) Brazilian imports of American materials and parts and (2) profits to Brazilian subsidiaries of American companies which can be remitted to the U.S.

10. FAA §.251(b) (5). Information and conclusion on the degree to which the country is making progress toward respect for the rule of law, freedom of expression and of the press, and recognition of the importance of individual freedom, initiative, and private enterprise.

The recent inauguration of an elected government marks a return to full constitutionality in Brazilian government. A new constitution has been adopted by the Congress and all the extra-constitutional Institutional Acts have terminated. A number of laws and programs have been instituted in recent years at all levels of government to improve the climate for private enterprise. Press and National Security laws enacted by the previous Brazilian government are more restrictive than previous legislation; it remains to be seen how these law will be applied by the new Government.

11. FAA §.251(b) (6). Information and conclusion on the degree to which the country is taking steps to improve its climate for private investment.

Brazil has provided a very broad range of incentives for private investment, domestic and foreign. The national state and municipal level of government offer tax incentives, tariff concessions and low cost financing for investments in priority sectors and development regions.

12. FAA §.251(b) (7). Information and conclusion on whether or or not the activity to be financed will contribute to the achievement of self-sustaining growth.

The activity will contribute to the achievement of self-sustaining growth through its assistance in identifying exploitable natural resources.

13. FAA §.251(b) (8). Information and conclusion on the extent to which the activity will contribute to the economic and political integration of Latin America.

The loan is intended to improve the capability of Brazilian institutions. To the extent that these institutions become effective in identifying economically significant resources, the indirect effect of the project could be to increase intra-Latin American trade.

14. FAA §.251(b). Information and conclusion on availability of financing from other free world sources, including private sources within the United States.

The Export-Import Bank, the Inter-American Development Bank and the International Bank for Reconstruction and Development are not interested in financing this activity. It is believed that private sources within the U.S. would not be willing to finance an activity of this kind.

15. FAA §.251(b). Information and conclusion on capacity of the country to repay the loan.

The loan will be repaid in dollars over 40 years at A.I.D. concessional interest rates. Such terms are considered within Brazil's capacity to repay.

16. FAA §.251(b). Information and conclusion on country's efforts to repatriate capital invested in other countries by its own citizens.

Brazil's efforts to stabilize the value of the cruzeiro through measures to counter inflation should contribute to the return of capital invested in other countries by its citizens.

17. FAA §.251(b). Information and conclusion on reasonable prospects of repayment.

The loan will be repaid by the Government of Brazil. Terms are within Brazil's capacity for repayment.

18. FAA §.251(e). Information and conclusion on availability of an application together with sufficient information and assurances to indicate reasonably that funds will be used in an economically and technically sound manner.

An application for this loan has been received. Sufficient information and assurances have been provided to indicate reasonably that funds will be used in an economically and technically sound manner.

19. FAA §.251(g). Information and conclusion on use of loan to assist in promoting the co-operative movement in Latin America.

The loan will have no effect on the cooperative movement in Latin America.

20. FAA §.251(h) Information and conclusion on whether the activity is consistent with the findings and recommendations of the Inter-American Committee for the Alliance for Progress in its review of national development activities.

The loan is consistent with the findings and recommendations of the Inter-American Committee for the Alliance for Progress in its review of national development activities.

21. FAA §.252(a) Total amount of money under loan which is going directly to private enterprise, is going to intermediate credit institutions or other borrowers for use by private enterprise, is being used to finance imports from private sources, or is otherwise being used to finance procurements from private sources.

A large portion of the loan funds will finance the services of U.S. government agency personnel. Commodities and contractual services procured will be from private U.S. or Brazilian sources.

22. FAA §.281. Extent to which the loan will contribute to the objective of assuring maximum participation in the task of economic development on the part of the people of the developing countries, through the encouragement of democratic private and local governmental institutions.

The loan is intended to assist agencies of the Brazilian Government at the national level.

23. FAA §.601(a). Information and conclusions whether loan will encourage efforts of the country to: (a) increase the flow of international

trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture, and commerce; and (f) strengthen free labor unions.

(a) Mineral surveys may lead to exploitation of resources sufficient for Brazil to export.
(b) Resource data developed as a result of this technical assistance program may stimulate private initiative and competition.
(c) No effect.
(d) No effect.
(e) Soundly gathered, evaluated and published, resource data may reduce the waste and inefficiency of poorly planned mineral and water projects.
(f) No effect.

24. FAA §.601(b). Information and conclusion on how the loan will encourage U.S. private trade and investment abroad and how it will encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).

The loan will have no direct effect.

25. FAA §.601(d). Conclusion and supporting information on compliance with the Congressional policy that engineering and professional services of U.S. firms and their affiliates are to be used in connection with capital projects to the maximum extent consistent with the national interest.

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Since the purpose of this technical assistance program is the strengthining of Brazilian Government institutions, the services of U.S. government agency personnel in comparable U.S. government positions were requested.

26. FAA §.602. Information and conclusions whether loan will permit American small business to participate equitably in the furnishing of goods and services financed by it.

Commodities from the U.S. will be procured in a manner to permit participation by U.S. small business.

27. FAA §.604(a); App.§.108. Compliance with restriction of Commodity procurement to U.S. except as otherwise determined by the President and subject to statutory reporting requirements.

Will be complied with.

28. FAA §.604(b). Compliance with bulk commodity procurement restriction to prices no higher than the market price prevailing in the U.S. at time of purchase.

Will be complied with.

29. FAA §.604(d). Compliance with requirement that marine insurance be purchased on commodities if the host country discriminates, and that such insurance be placed in the U.S.

Loan funds will be made available for marine insurance on commodities shipped when such insurance is placed and competitive basis as specified in this Section of the Act. In the event that Brazil discriminates against any U.S. marine insurance company, it will be required, that insurance be placed with a U.S. company as required by this Section.

30. FAA §.604(e). Compliance with requirement that funds not be used for procurement of any agricultural commodity or product thereof outside the United States when the domestic price of such commodity is less than parity.

No agricultural commodities will be procured.

31. FAA §.611(a)(1). Information and conclusion on availability of engineering, financial, and other plans necessary to carry out the assistance and of a reasonably firm estimate of the cost of the assistance of the United States.

Necessary technical and financial plans have been completed and a reasonably firm estimate of the cost of the activity to the United States has been ascertained.

32. FAA §.611(a) (2). Necessary legislative action required within recipient country and basis for reasonable anticipation such action will be completed in time to permit orderly accomplishment of purposes of loan.

No special legislative action is required.

33. FAA §.611(b); App.§.101. If water or water-related land resource construction project or program, information and conclusion on benefit-cost computation.

The water-related aspect of this activity will be concerned solely with data collection.

34. FAA §.611(c). Compliance with requirement that contracts for construction be let on competitive basis to maximum extent practicable.

No construction contracts will be invovled.

35. FAA §.612(b) and 636(h). Appropriate steps that have been taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services and foreign currencies owned by the U.S. are utilized to meet the cost of contractual and other services.

Brazil's contribution of local currency to this undertaking will be made in the form of salaries of Brazilian Government personnel and the provision of facilities and equipment. As stated in Section IV, this is believed to be the maximum possible commitment of local currency that the Government can make at present. However, the loan agreement will provide that if AID program-related, Brazilian Government-owned local currencies become available during the course of the Mineral and Water Resources Program, such currencies will be used in lieu of AID dollars for local costs. Present and anticipated requirements for U.S.-owned Brazilian currency rule out the use of such funds for this purpose.

36. FAA §.619. Compliance with requirement that assistance to newly independent countries be furnished through multilateral organizations or plans to maximum extent appropriate.

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Not applicable. Brazil is not a newly independent country.

37. FAA §.620(a);App.§.107(a) and (b). Compliance with prohibition against assistance to Cuba and any country (a) which furnishes assistance to Cuba or failed to take appropriate steps by February 14, 1964, to prevent ships or aircraft under its registry from carrying equipment, materials, or supplies from or to Cuba; or (b) which sells, furnishes, or permits any ships under its registry from carrying items of primary strategic significance, or items of economic assistance to Cuba.

No assistance will be furnished under this loan to the present Government of Cuba, nor does Brazil furnish assistance to the present Government of Cuba. Brazil has taken appropriate steps to prevent ships or aircrafts under its registry from engaging in any Cuban trade.

38. FAA §.620(b). If assistance to the government of a country, existence of determination it is not controlled by the international Communist movement.

The Secretary of State has determined that Brazil is not controlled by the international communist movement.

39. FAA §.620(c). If assistance to the government of a country, existence of indebtedness to a U.S. citizen for goods or services furnished or ordered where such citizen has exhausted available legal remedies or where the debt is not denied or contested by such government or the indebtedness arises under an unconditional guaranty given by such government:

Brazil is not known to be indebted to any U.S. Citizen on goods or services furnished or ordered where such a citizen has exhausted available legal remedies or where the debt is not denied or contested by the Borrower or the indebtedness arises under an unconditional guarantee of payment by the Borrower.

40. FAA §.620(d). If assistance for any productive enterprise which will compete in the U.S. with U.S. enterprise, existence of agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan.

Not applicable.

41. FAA §.620(e)(1). If assistance to the government of a country, extent to which it (including government agencies or subdivisions) has, after January 1, 1962, taken steps to repudiate or nulify contracts or taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking appropriate steps to discharge its obligations.

Neither the Government of Brazil nor any governmental agency or subdivision thereof has, on or after January 1, 1962, nationalized expropriated, or seized, ownership or control of property of any U.S. citizen or firm, taken steps to repudiate or nullify contracts with such citizens or firms or imposed or inforced discriminatory taxation or other exactions or restrictive conditions or taken other actions having the effect of nationalizing expropriating or otherwise seizing ownership or control of property owned by U.S. citizen or firms, as

specified in this Section of the Act without taking appropriate steps to discharge its obligations as specified in this Section of the Act.

42. FAA §.620(f); App.§.109. Compliance with prohibitions against assistance to any Communist country.

Assistance under this loan will not be furnished to any Communist country.

43. FAA §.620(g). Compliance with prohibition against use of assistance to compensate owners for expropriated or nationalized property.

Assistance under this loan will not be used to compensate for expropriated or nationalized property.

44. FAA S.620(h). Compliance with regulations and procedures adopted to insure against use of assistance in a manner which, contrary to the best interests of the U.S., promotes or assists the foreign aid projects or activities of the Communist-bloc countries.

Assistance provided by this loan will not be used in a manner which, contrary to the best interests the U.S., promotes or assists the foreign AID projects or activities of the Communist-bloc countries.

45. FAA §.620(l). Existence of determination that the country is engaging in or preparing for aggressive military efforts.

The President has not determined that Brazil is engaging in or preparing for aggressive military efforts.

46. FAA §.620(i). Information on representation of the country at any international conference when that representation includes the planning of activities involving insurrection or subversion against the U.S. or countries receiving U.S. assistance.

There has been no Brazilian Government representation nor any private Brazilian representation with Brazilian Government sanction at any international conference in which that representation includes the planning of activities involving insurrection or subversion against the U.S. or countries receiving U.S. assistance.

47. FAA §.620(k). If construction of productive enterprise where aggregate value of assistance to be furnished by U.S. will exceed $100 million, identification of statutory authority.

Not applicable.

48. FAA §.620(l). Consideration which has been given to denying assistance to the government of a country which after December 31, 1966, has failed to institute the investment guaranty program for the specific risks of inconvertibility and expropriation or confiscation.

Brazil has signed and instituted such a agreement.

49. FAA §.620(n); App.107(b) and 116. Compliance with prohibition against assistance to countries which traffic or permit trafficking with North Viet-Nam.

Brazil does not traffic nor knowingly permit trafficking with North Viet-Nam.

50. FAA §.620(o). If country has seized, or imposed any penalty or sanction against, any U.S. fishing vessel on account of its fishing activities in international waters, information on the consideration which has been given to excluding the country from assistance.

Brazil has not seized or imposed any penalty on sanction against any U.S. fishing vessel in International water.

51. FAA §.620(q). Existence of default under any Foreign Assistance Act loan to the country.

No loans to Brazil under the Foreign Assistance Act are in default.

52. FAA §.621. Information and conclusion on how the loan in providing technical assistance will utilize to the fullest extent practicable goods and professional and other services from private enterprise on a contract basis. If the facilities of other Federal agencies will be utilized, information and conclusion on whether they are particularly suitable, are not competitive with private enterprise, and can be made available without undue interference with domestic progfams.

Commodities to be provided under this loan will be procured by the U.S.Geological Survey, using their normal procedures for procuring such commodities for similar programs which the Survey carries out in the U.S.Technical services will be provided by USGS personnel except for certain survey contracts which will be let to Brazilian private firms. The Brazilian Governments agencies being assisted have responsibilities similar to those of the USGS and it is therefore believed that USGS personnel are most suited for the assignment. The USGS has indicated that the required personnel are available for the program. They have not indicated that such services would interfere with their domestic programs.

53. App. §.102. Compliance with requirement that payments in excess of $25,000 for architectural and engineering services on any one project be reported to Congress.

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No contracts for architectural and engineering service in excess of $25,000 will be financed under the loan.

54. App §.104. Compliance with bar against funds to pay pensions, etc., for military personnel.

Funds obligated by the loan will not be used to pay pensions, annuities etc.

55. App. §.106. If country attempts to create distinctions because of their race or religion among Americans in granting personal or commercial access or other rights otherwise available to U.S. citizens generally, application which will be made in negotiations of contrary principles as expressed by Congress.

No attempts by Brazil to create distinctions because of race or religion among Americans in granting personal or commercial access or other rights otherwise available to U.S. citizens generally are known. If the Host Government attempts to create such distinctions, application will be made in negotiations of contrary principles as expressed by Congress.

56. App. §.111. Compliance with existing requirements for security clearance of personnel.

Existing requirements for security clearance of personnel will be observed.

57. App. §.112. Compliance with requirement for approval of contractors and contract terms for capital projects.

The loan agreement will so stipulate.

qV

58. App. §. 114. Compliance with bar against use of funds to pay assessments, etc., of U.N. member.

Loan funds will not be used to make payment to any U.N. member.

59. App. §. 115. Compliance with regulations on employment of U.S. and local personnel for funds obligated after April 30, 1964. (Regulation 7).

Not applicable

60. App. §. 401. Compliance with bar against use of funds for publicity or propaganda purposes within U.S. not heretofore authorized by Congress.

Loan funds will not be used for publicity or propaganda purpose within the U.S.

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USAID BRAZIL FORM 1-2

IMPLEMENTATION PLAN
PART II. WORK SCHEDULE

COOPERATING COUNTRY	BRAZIL
DATE PREPARED	12/5/66
COPY	ORIGINAL

RESPONSIBLE AID OFFICE AND OFFICE PROJECT COORDINATOR
M.M. Vogel - ENRO
M.G. White - ENRG/USGS

AID OFFICE

RESPONSIBLE COOPERATING COUNTRY AGENCY (DNPM)
Nat'l Dept. of Mineral Production
Ministry of Mines and Energy (MME)

PURPOSE OF ACTIVITY To assist in developing the National Department of Mineral Production into an organization with the professional skills needed to carry out necessary work in geology and mineral deposit research, prospecting, discovery appraisal, and development of mining technology (Continuation of work begun in FY 1965 under grant funding)

DATES	PROAG SIGNED	LOAN AUTHORIZED	LOAN SIGNED	A.I. PROJECT NO

ACTIVITY TITLE: NATIONAL MINERALS SURVEY BAHIA PROJECT

NO: MMS-1

NO.	DESCRIPTION OF PHASES OR MAJOR STEPS	TARGET DATES START	TARGET DATES COMPLETION	TIME SPAN FY-67	FY-68	FY-69	FY-70	FY-71	FY-72	REMARKS
1	Geological mapping and mineral resources appraisal of an area of about 250,000 square kilometers in central Bahia State bounded on the North and South by the 10th and 15th parallels of latitude and on the East and West by the 38th and 43rd meridians of longitude.	4/65	6/71							
2	Systematic geologic mapping of the project area of 20 one-degree quadrangles at a scale of 1:250,000.	5/66	6/71							
3	Systematic mineral resources appraisal and evaluation of all known mineral localities within the Bahia project area.	5/66	6/71							
4	Obtaining systematic aerial photographic coverage of the Project area and photogrammetric map compilation to serve as bases for the geologic mapping	12/63	6/70							

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May 5, 1967

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USAID/BRAZIL
FORM I-2a

IMPLEMENTATION PLAN

PART II. WORK SCHEDULE (CONTINUATION)

COOPERATING COUNTRY: BRAZIL | ACTIVITY NO.: | DATE PREPARED: 12/5/66 | COPY: ORIGINAL

NO.	DESCRIPTION OF PHASES OR MAJOR STEPS	TARGET DATES START	TARGET DATES COMPLETION	FY-67	FY-68	FY-69	FY-70	FY-71	FY-72	REMARKS
5	Develop for the DNPM a cadre of approx. 60 young geologists and geo-scientists with a high proficiency of professional competence in geological mapping, mineral resources evaluation and appraisal, mineral prospecting, mineralogy, petrology and general resources inventory by in-service training and specialized advanced training in the U.S.A.	4/65	6/71	xxxxxxxx	xxxxxxxx	xxxxxxxx	xxxxxxxx	xxxxxxxx		
6	Establish an adequate administrative and managerial structure within the Project that by experience gained is in a position to operate other basic projects of the DNPM under the requirements of the GOB Ten-Year Master Plan for the Evaluation of the Mineral Resources of Brazil.	6/65	6/71	xxxxxxxx	xxxxxxxx	xxxxxxxx	xxxxxxxx	xxxxxxxx		
7	Improve supporting technical services of the DNPM, including the library, the cartographic services, analytical laboratories and beneficiation laboratory.	12/64	6/71	xxxxxxxx	xxxxxxxx	xxxxxxxx	xxxxxxxx	xxxxxxxx		
8	Establish a mineral statistics office that, using modern techniques of data compilation can provide a public information service on mineral development and trade in Brazil.	7/67	6/69		xxxxxxxx	xxxxxxxx				
9	Upgrade the mining advisory service of the DNPM in the general field of mining technology and development of an effective repository in DNPM of all information regarding minerals and mining technology in Brazil.	7/67	6/69		xxxxxxxx	xxxxxxxx				

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USAID BRAZIL
FORM 2a

IMPLEMENTATION PLAN

PART II. WORK SCHEDULE (CONTINUATION)

COOPERATING COUNTRY	ACTIVITY NO.	DATE PREPARED	COPY
BRAZIL		12/5/66	ORIGINAL

NO.	DESCRIPTION OF PHASES OR MAJOR STEPS	TARGET DATES START	TARGET DATES COMPLETION	TIME SPAN FY-67	FY-68	FY-69	FY-70	FY-71	FY-72	REMARKS
10	Upgrade and streamline editorial and publication procedures as a means of establishing easy and rapid access of geological maps and mineral resources information to the general public.	5/65	6/71	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx		
11	Publish geologic maps and reports and mineral evaluation and appraisal reports on the entire Bahia Project area.	4/66	6/71	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	

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USAID/BRAZIL FORM 1-4

IMPLEMENTATION PLAN

PART IV. PERSONNEL REQUIREMENTS

COOPERATING COUNTRY	ACTIVITY TITLE	NO	E.I. PROJECT NO	DATE PREPARED	COPY
BRAZIL	NATIONAL MINERALS SURVEY Bahia Project			12/5/66	ORIGINAL

STEP NO.	POSITION OR SPECIALTY GRADE AND SALARY	NO	TYPE 1/	PLANNED ARRIVAL DATE	FY-67	FY-68	FY-69	FY-70	FY-71	REMARKS
1-11	Principal Advisor, Geologist USGS Program Coordinator FC-3 $18,700 pa	1	PASA USGS	present	xxxx	xxxx	xxxx	xxxx	xxxx	
1-11	Geologist-Geochemist (Project Chief and Deputy Chief of USGS Party) FC-4 $17,500 pa	1	PASA	present	xxxx	xxxx	xxxx	xxxx	xxxx	
1-5	Geologists (Specialists in mineralogy, photogeology, economic geology, petrology, regional geology) FC-5 $15,500 pa	4	PASA USGS	present	xxxx	xxxx	xxxx	xxxx	xxxx	
1-5	Geologist, minerals spec. FC-5 $15,500 pa	1	PASA USGS	7/67		xxxx	xxxx	xxxx	xxxx	
7-9	Mining Engineer Spec. FC-5 $15,500 pa (U.S. Bureau of Mines)	2	PASA USBM	7/67		xxxx	xxxx			
1-11	Program Assistant (Admin.) FC-6 $13,200 pa	1	PASA USGS	present	xxxx	xxxx	xxxx	xxxx	xxxx	
1-11	TDY - Specialists in geology, cartography, geochemistry, mining (equiv. to 1 1/2 man years)	8	PASA USGS & USBM			xx xx	xx xx	xx xx	xx xx	

1/ [illegible] DH — U.S. [illegible] PASA — [illegible]
UC — U.S. [illegible] LDH — [illegible]
UPS — U.S. [illegible] LPS — [illegible] GOB — Government of Brazil

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USAID/BRAZIL FORM 1-A

IMPLEMENTATION PLAN

PART VI. COMMODITY REQUIREMENTS

COOPERATING COUNTRY: BRAZIL

DATE PREPARED: 12/5/66

COPY: ORIGINAL

ACTIVITY TITLE: NATIONAL MINERALS SURVEY
BAHIA PROJECT

NO.

E I PROJECT NO.

STEP NO.	DESCRIPTION	TOTAL COST	COSTS BY FISCAL YEAR (US$ THOUSANDS) FY-68	FY-69	FY-70	FY-71	FY-72	TYPE [1]	REMARKS
	U.S. $ Procurement in U.S. with DL Funding (in thousands):								
	X-ray Diffractrometer and Spectrochemical laboratory equipment and supplies	70	20	20	20	10			
	Equipment and supplies for modern paleontological laboratory to upgrade research activities	65	20	20	20	5			
	Modern instrumentation equipment & supplies for analytical chemistry laboratories	35	10	10	10	5			
	Mineralogical & petrological lab equip & supplies	55	15	15	15	10			
	Photogeology, geochemical prospecting & sedimentation lab equip & supplies	35	10	10	10	5			
	Cartographic equipment and supplies for map publication	20	5	5	5	5			
	Books, Technical & Journals	20	5	5	5	5			
	Ore beneficiation lab equip & supplies	50	15	15	15	5			
		350	100	100	100	50			
	Local Procurement with Cr$ Loan Funds (in thousands of dollars)								
	Field equipment, vehicles, radio communication system, etc. in support of field operations.	160	-	-	60	50	50		
	Lab equipment & supplies for laboratory operation	150			50	50	50		
		310			110	100	100		

[1] INDICATE BY LETTER WHETHER COMMODITIES ARE: A — AID DIRECT, B — OTHER U.S. AGENCIES, OR C — CONTRACT

USAID/BRAZIL FORM 1 | IMPLEMENTATION PLAN | COOPERATING COUNTRY: BRAZIL | DATE PREPARED: 12/5/66 | COPY: ORIGINAL

PART V. PARTICIPANT REQUIREMENTS

ACTIVITY TITLE: NATIONAL MINERALS SURVEY
BAHIA PROJECT

STEP NO	FIELD OF TRAINING	NO	FY-68	FY-69	FY-70	FY-71	FY-72	MAN MO	DOLLAR COSTS
	Academic - Graduate study at selected universities and USGS facilities for geologists	8	xxxxxxxx					96	$64,000
	Academic - Graduate study at selected universities and USGS facilities for geologists	10		xxxxxxxxx				120	$80,000
	Academic - Graduate study at selected universities and USGS facilities for geologists	12			xxxxxxxxx			144	$96,000
	Academic - Graduate study at selected universities and USGS facilities for geologists	12				xxxxxxxx			
	Scientific Admin. Organ and Management study/training for senior geologists (3 month periods)	8	2	2	2	2		30	$32,000
	In-service training at U.S. Gov't facilities (4 to 8 months periods) for geochemistry, engineering geology, photogeology, petrography, mineralogy, library science, cartography, mineral statistics service, mining technology	24	10	8	4	2		90	$95,000

Best Available Document

USAID/BRAZIL FORM 1-2

IMPLEMENTATION PLAN

PART II. WORK SCHEDULE

COOPERATING COUNTRY	DATE PREPARED	COPY
BRAZIL	12/12/66	ORIGINAL

RESPONSIBLE AID OFFICIAL/PROJECT COORDINATOR	AID OFFICE
M.M. Vogel - ENRO M.G. White - ENRG/USGS	

RESPONSIBLE COOPERATING COUNTRY AGENCY
Nat'l Dept. of Mineral Production Ministry of Mines and Energy

PURPOSE OF ACTIVITY This project is one of the new and larger of the "specific projects" basic in the Ten Year Master Plan for Mineral Evaluation of Brazil. Technical assistance will be provided for intensive geological and mineral investigation of approx. one-sixth of the total area of the Project in the expectation that on completion of the intensive phase the boost given to project operations will provide the impetus to carry it to completion in the period of the Ten Year Plan.

DATES	PROAG SIGNED	LOAN AUTHORIZED	LOAN SIGNED	E.I. PROJECT NO

ACTIVITY TITLE: NATIONAL MINERALS SURVEY CENTRAL BRAZIL PROJECT

NO.

NO	DESCRIPTION OF PHASES OR MAJOR STEPS	TARGET DATES START	TARGET DATES COMPLETION	TIME SPAN FY-68	FY-69	FY-70				REMARKS
1	Complete geological mapping of approx. 50,000 square kilometers or four square degrees of territory within the Central Brazil Project area, in the headquarters drainage of the Tocantins and Parana rivers in the State of Goias.	7/67	6/70							
2	Complete geological mapping on 16 one-quarter degree (15 minutes) quadrangles at a scale of 1:100,000 of areas delimited as follows: Four quadrangles between 13°00' and 15°00' Lat. and 48°30' and 49°30' Long.	7/67	6/70							
3	Complete the evaluation of all mineral localities and specific appraisal of those localities which indicate promise for development or that may be of significance in determination of mineral provinces or epochs in the region.	7/67	6/70							

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USAID BRAZIL FORM 1-2a

IMPLEMENTATION PLAN

PART II. WORK SCHEDULE (CONTINUATION)

COOPERATING COUNTRY	ACTIVITY NO.	DATE PREPARED	COPY
BRAZIL		12/12/66	ORIGINAL

NO.	DESCRIPTION OF PHASES OR MAJOR STEPS	TARGET DATES START	TARGET DATES COMPLETION	TIME SPAN FY-68	FY-69	FY-70				REMARKS
4	Complete geological and mineral reconnaissance investigations of areas adjacent to the project, as necessary to a better understanding of the rocks and minerals of the region to be mapped in detail.	7/67	6/70	xxxxxxxxxxxxxxxxxxxxxxxxxxxx						
5	Train 12 or more young Brazilian geologists, members of the staff of the DNPM in all phases of geologic investigations of the rocks and minerals of the region, essential laboratory techniques and report and map preparation.	7/67	6/70	xxxxxxxxxxxxxxxxxxxxxxxxxxxx						
6	Publish geological maps and reports on mineral evaluation on all work undertaken in the project area.	7/67	6/70	xxxxxxxxxxxxxxxxxxxxxxxxxxxx						
7	Publish a metalogenic map of the region showing mineral localities, mineral districts, metalogenic provinces and epochs.	6/67	6/70	xxxxxxxxxxxxxxxxxxxxxxxxxxxx						

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USAID BRAZIL FORM 14

IMPLEMENTATION PLAN

PART IV. PERSONNEL REQUIREMENTS

COOPERATING COUNTRY	ACTIVITY TITLE	NO	E.I. PROJECT NO	DATE PREPARED	COPY
BRAZIL	NATIONAL MINERALS SURVEY CENTRAL BRAZIL PROJECT			12/12/66	ORIGINAL

STEP NO.	POSITION OR SPECIALTY GRADE AND SALARY	NO	TYPE	PLANNED ARRIVAL DATE	TIME SPAN FY-68	FY-69	FY-70					REMARKS
1-7	Geologists, Project Chief specialist in Regional Geology Ultrabasic Rocks and Evaluation of Minerals. FC-4 $17,000	1	PASA (USGS)	7/67								
1-7	Geologist, Regional Geology FC-5 $15,500	1	PASA (USGS)	7/67								
1-7	Geologist, Minerals FC-5 $15,500	1	PASA (USGS)	7/67								

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USAID BRAZIL FORM 11

IMPLEMENTATION PLAN

PART V. PARTICIPANT REQUIREMENTS

COOPERATING COUNTRY: BRAZIL

DATE PREPARED: 12/12/66

COPY / ORIGINAL

ACTIVITY TITLE: NATIONAL MINERALS SURVEY CENTRAL BRAZIL PROJECT

NO.

U.S. PROJECT NO.

STEP NO	FIELD OF TRAINING	NO	TIME SPAN FY-68	FY-69	FY-70	MAN MO	DOLLAR COSTS
	Academic - Graduate study at selected universities and USGS facilities for geologists	3	XXXXXXXX			36	$ 24,000
	Academic - Graduate study at selected universities and USGS facilities for geologists	3		XXXXXXXX		36	$ 24,000
	Academic - Graduate study at selected universities and USGS facilities for geologists	3			XXXXXXXX	36	$ 24,000
	Specialized in-service training at U.S.Gov't facilities - practical field and laboratory studies	6	2	2	2	18	$ 21,000

USAID/BRAZIL FORM 14 — IMPLEMENTATION PLAN

PART VI. COMMODITY REQUIREMENTS

COOPERATING COUNTRY: BRAZIL

DATE PREPARED: 12/13/66 — COPY: ORIGINAL

ACTIVITY TITLE: NATIONAL MINERALS SURVEY
CENTRAL BRAZIL PROJECT

NO.

F.I PROJECT NO.

STEP NO.	DESCRIPTION	TOTAL COST	COSTS BY FISCAL YEAR (US$ THOUSANDS) FY-68	FY-69	FY-70			TYPE [1]	REMARKS
	Geochemical prospecting equipment for mobile laboratories	45	20	20	5				
	Mineralogical and petrological lab equipment and supplies	45	20	20	5				
	Cartographic equipment and supplies for map publication	15	5	5	5				
	Geophysical prospecting equipment	15	5	5	5				
	Totals	120	50	50	20				
	Local Procurement with Cr$ Loan Funds (in thousands of dollars)								
	Field equipment vehicles radio communication system etc. in support of field operations.	60		40	20				
	Lab equipment and supplies for laboratory operations	50		20	30				
		110		60	50				

[1] INDICATE BY LETTER WHETHER COMMODITIES ARE: A — AID DIRECT, O — OTHER U. S. AGENCIES, OR C — CONTRACT

USAID BRAZIL FORM 1-2

IMPLEMENTATION PLAN

PART II. WORK SCHEDULE

COOPERATING COUNTRY	DATE PREPARED	COPY
BRAZIL	12/5/66	ORIGINAL

RESPONSIBLE AND TECHNICAL/PROJECT COORDINATOR: M.M. Vogel - ENRO; M.G. White - ENRO/USGS

AID OFFICE:

RESPONSIBLE COOPERATING COUNTRY AGENCY: (DNPM) Nat'l Dept. of Mineral Production, Ministry of Mines & Energy (MME)

PURPOSE OF ACTIVITY - This project is to be undertaken as one of the "specific projects" of the Ten Year Master Plan to evaluate the Mineral Resources of Brazil (1965-1974) established by the GOB (Ministry of Mines and Energy) of which the Departamento Nacional da Produção Mineral is the executor to determine the possibility of re-establishing production of tungsten mining district in central Rio Grande do Norte.

DATES: PROAG SIGNED	LOAN AUTHORIZED	LOAN SIGNED	I.I. PROJECT NO

ACTIVITY TITLE: NATIONAL MINERALS SURVEY TUNGSTEN PROJECT

NO:

NO	DESCRIPTION OF PHASES OR MAJOR STEPS	TARGET DATES: START	TARGET DATES: COMPLETION	TIME SCALE: FY-68	FY-69					REMARKS
1	Complete geologic mapping of all or select portions of the 5,000 square kilometer tungsten mineral district of Rio Grande do Norte at a scale of 1:100,000 or at scales that may most accurately define geological features important in delimiting tungsten mineralization.	7/67	6/69	xxxxxxxxxxxxxxxx						
2	Determine through geologic mapping, drilling, sampling and assaying the structural ore controls of the tungsten mineralization and the detailed mineralogy of the ores, gangue and wall rock.	7/67	6/69	xxxxxxxxxxxxxxxx						
3	Establish guidelines for prospecting for further deposits of scheelite and delimit the areas within the district favorable for such prospecting.	7/67	6/69	xxxxxxxxxxxxxxxx						
4	Determine the economic factors relating to the possible re-establishment of this mineral district into an ore-producer at a scale commensurate to its potential	7/67	6/69	xxxxxxxxxxxxxxxx						

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USAID BRAZIL FORM 1-2a

IMPLEMENTATION PLAN

PART II. WORK SCHEDULE (CONTINUATION)

COOPERATING COUNTRY	ACTIVITY NO.	DATE PREPARED	COPY
BRAZIL		12/11/66	ORIGINAL

NO.	DESCRIPTION OF PHASES OR MAJOR STEPS	TARGET DATES START	TARGET DATES COMPLETION	TIME SPAN FY-68	TIME SPAN FY-69					REMARKS
5	To train four or more young geologists of the staff of the DNPM in mining geology and mineral district studies.	7/67	6/69	xxxxxxxxxxxxxxxxxxxx						
6	To publish detailed reports and maps on the mineral district as a whole in order that interest can be generated in the private sector toward organizing a coordinated mining development program for the district.	7/67	6/69	xxxxxxxxxxxxxxxxxxxx						
7	To complete the project including preparation of all final manuscripts of reports and maps, two years after it is started.	7/67	6/69	xxxxxxxxxxxxxxxxxxxx						

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USAID/BRAZIL FORM 1-4

IMPLEMENTATION PLAN

PART IV. PERSONNEL REQUIREMENTS

COOPERATING COUNTRY	ACTIVITY TITLE	NO	A.I. PROJECT NO	DATE PREPARED	COPY
BRAZIL	NATIONAL MINERALS SURVEY TUNGSTEN PROJECT			12/11/66	ORIGINAL

STEP NO.	POSITION OR SPECIALTY GRADE AND SALARY	NO	TYPE [1]	PLANNED ARRIVAL DATE	TIME SPAN FY-68	TIME SPAN FY-69	REMARKS
1-7	Senior USGS Geologist (Minerals Specialist in tungsten mining) FC-4 $17,000	1	PASA (USGS)	7/67			
	Mining Engineer (Ore beneficiation spec. in tungsten mining) FC-5 $15,500	1	PASA (USGS)	7/67			

[1] Indicate by letter whether DH — U.S. direct hire, PASA — [illegible]
US — U.S. [illegible], LDH — local direct hire, [illegible]
UPS — U.S. [illegible], LPS — local personnel [illegible] — GOB — Government of Brazil

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USAID/BRAZIL FORM 1-3

IMPLEMENTATION PLAN

PART V. PARTICIPANT REQUIREMENTS

COOPERATING COUNTRY: BRAZIL

DATE PREPARED: 12/11/66

COPY: ORIGINAL

ACTIVITY TITLE: NATIONAL MINERALS SURVEY
TUNGSTEN PROJECT

NO.

E I PROJECT NO.

STEP NO	FIELD OF TRAINING	NO	TIME SPAN FY-68	FY-69	FY-70	FY-71	MAN MO	DOLLAR COSTS
	Academic and in-service training in economic geology programs and/or ore deposits and mineral economics	4			XXXXXXXX		48	$32,000

USAID/BRAZIL FORM 1-6

IMPLEMENTATION PLAN

PART VI. COMMODITY REQUIREMENTS

COOPERATING COUNTRY: BRAZIL

DATE PREPARED: 12/11/66

COPY: ORIGINAL

ACTIVITY TITLE: NATIONAL MINERALS SURVEY
TUNGSTEN PROJECT

NO.

E.I. PROJECT NO.

STEP NO.	DESCRIPTION	TOTAL COST	COSTS BY FISCAL YEAR (US$ THOUSANDS) FY-68	FY-69				[1] TYPE	REMARKS
	U.S. $ Procurement in U.S. with DL Funding (in thousands)								
	Geochemical and Geophysical instruments	90	50	40					
	Ore beneficiation equipment	90	50	40					
	T o t a l	180	100	80					
	Local Procurement with Cr$ Loan Funds (in thousands of dollars)								
	Vehicles, field and field equipment including drilling equip parts and supplies	21		21					

[1] INDICATE BY LETTER WHETHER COMMODITIES ARE: A — AID DIRECT
B — OTHER U. S. AGENCIES, OR C — CONTRACT

USAID BRAZIL
FORM 2

IMPLEMENTATION PLAN

PART II. WORK SCHEDULE

COOPERATING COUNTRY	DATE PREPARED	COPY
BRAZIL	12/12/66	ORIGINAL

RESPONSIBLE AID/USAID PROJECT COORDINATOR
M.M. Vogel - ENRO
M.G. White - ENRO/USGS

AID OFFICE

RESPONSIBLE COOPERATING COUNTRY AGENCY
Nat'l Dept. of Mineral Production
Ministry of Mines and Energy

PURPOSE OF ACTIVITY To determine the distribution and reserves of phosphate deposits through intensive geological investigations along the northeast coast of Brazil and the Jatobá sedimentary basin in western Pernambuco. This project is to be undertaken as one of the "specific projects" of the Ten Year Master Plan of the Gov't of Brazil. Investigations will be made to determine the quality and reserves of the material which may be used as a agricultural fertilizer.

DATE PROAG SIGNED	LOAN AUTHORIZED	LOAN SIGNED

PROJECT NO

ACTIVITY TITLE NATIONAL MINERALS SURVEY PHOSPHATE PROJECT

NO

NO	DESCRIPTION OF PHASES OR MAJOR STEPS	TARGET DATES START	TARGET DATES COMPLETION	TIME SPAN FY-66	FY-67					REMARKS
1	To map, geologically, in detail, the Cretaceous marine phosphorite deposits in the vicinity of Recife, to establish the geological environment of deposition and stratigraphic position of the phosphate deposits as a means for laying some groundwork for undertaking mapping in other areas.	7/67	6/69	xxxxxxxxxxxxxxxx						
2	To undertake geological reconnaissance of possible phosphate-bearing areas north and south of Recife and to map those areas that appear to have a potential as a source of phosphate rock.	7/67	6/69	xxxxxxxxxxxxxxxx						
3	To undertake a geological and geochemical reconnaissance of all coastal areas of NE Brazil that have Cretaceous rocks in order to determine the existence of phosphate deposits in these areas.	7/67	6/69	xxxxxxxxxxxxxxxx						
4	To map, evaluate or appraise the newly discovered phosphate localities in the Jatobá basin in western Pernambuco state.	7/67	6/69	xxxxxxxxxxxxxxxx						

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USAID BRAZIL FORM 1-2a

IMPLEMENTATION PLAN

PART II. WORK SCHEDULE (CONTINUATION)

COOPERATING COUNTRY	ACTIVITY NO.	DATE PREPARED	COPY
BRAZIL		12/12/66	ORIGINAL

NO.	DESCRIPTION OF PHASES OR MAJOR STEPS	TARGET DATES		TIME SPAN						REMARKS
		START	COMPLETION	FY-68	FY-69					
5	Establish guidelines for geological and geochemical prospecting for phosphate as a means of stimulating private prospecting for these deposits in both the coastal areas as well as in the Jatobá basin.	7/67	6/69	xxxxxxxxxxxxxxxxxx						
6	Publish geologic reports and maps on all field and laboratory investigations undertaken under the terms of this project.	7/67	6/69	xxxxxxxxxxxxxxxxxx						

USAID/BRAZIL FORM 1-4	IMPLEMENTATION PLAN PART IV. PERSONNEL REQUIREMENTS	COOPERATING COUNTRY BRAZIL	ACTIVITY TITLE NATIONAL MINERALS SURVEY PHOSPHATE PROJECT	NO	E I PROJECT NO	DATE PREPARED 12/12/66	COPY ORIGINAL

STEP NO.	POSITION OR SPECIALTY GRADE AND SALARY	NO	TYPE [1]	PLANNED ARRIVAL DATE	TIME SPAN FY-68	FY-69						REMARKS
1-6	Geologists (Specialists in phosphate investigations) USGS FC-5 $ 15,500	2	PASA (USGS)	7/67	xxxxxxxxxxxxxxxxxx							

[1] Use code by letter where: DH — U.S. direct hire, PASA — public affairs agency service agreement
UC — U.S. national contract, LDH — local direct hire, [illegible] — [illegible]
UPS — U.S. personal service contract, LP — local personal service contract, GOB — Government of Brazil

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USAID-BRAZIL FORM 11

IMPLEMENTATION PLAN

PART V. PARTICIPANT REQUIREMENTS

COOPERATING COUNTRY: BRAZIL

DATE PREPARED: 12/12/66

COPY: ORIGINAL

ACTIVITY TITLE: NATIONAL MINERALS SURVEY
PHOSPHATE PROJECT

NO.

U.S. PROJECT NO.

STEP NO	FIELD OF TRAINING	NO	TIME SPAN FY-68	FY-69	FY-70	MAN MO	DOLLAR COSTS
	In-service training with USGS field and laboratory investigations, mining geology aspects of phosphate mining and academic training in U.S. universities with emphasis on the study of sedimentary mineral deposits and the mineralogy and petrology of sedimentary ores.				XXXXXXXX	96	$62,000

USAID/BRAZIL FORM 1-6

IMPLEMENTATION PLAN

PART VI. COMMODITY REQUIREMENTS

COOPERATING COUNTRY: BRAZIL

DATE PREPARED: 12/12/66

COPY: ORIGINAL

ACTIVITY TITLE: NATIONAL MINERALS SURVEY PHOSPHATE PROJECT

NO.

E.I. PROJECT NO.

STEP NO.	DESCRIPTION	TOTAL COST	COSTS BY FISCAL YEAR (US$ THOUSANDS) FY-68	FY+69				TYPE [1]	REMARKS
	U.S. $ Procurement in U.S. with DL Funding (in thousands):								
	Special truck-mounted auger drill for shallow hole drilling phosphate beds including tools spare parts and accessories	30	20	10					
	Geochemical prospecting equipment-field use	25	20	5					
	Geophysical prospecting equipment - field use	15	10	5					
		70	50	20					
	Local Procurement with Cr$ Loan Funds (in thousands of dollars):								
	Field equipment including four field vehicles in support of field operations	30		30					

[1] INDICATE BY LETTER WHETHER COMMODITIES ARE: A — AID DIRECT, B — OTHER U.S. AGENCIES, OR C — CONTRACT

USAID/BRAZIL FORM 1-2

IMPLEMENTATION PLAN

PART II. WORK SCHEDULE

COOPERATING COUNTRY	BRAZIL
DATE PREPARED	12/12/66
COPY / ORIGINAL	
DATES: PROAG SIGNED / LOAN AUTHORIZED / LOAN SIGNED	
A.I.D. PROJECT NO	
ACTIVITY TITLE	NATIONAL MINERALS SURVEY GROUND WATER PROJECT
NO	

RESPONSIBLE AID OFFICE/PROJECT COORDINATOR: M.M. Vogel - ENRG; M.G. White - ENRG/USGS

AID OFFICE

RESPONSIBLE COOPERATING COUNTRY AGENCY: Nt'l Dept. of Mineral Production, Ministry of Mines and Energy

PURPOSE OF ACTIVITY - The purpose of this project is to strengthen and support the Ground Water Branch of the Ministry of Mines and Energy by providing practical training for its newly hired geologists and the guidance of an experienced well driller for its well drilling crews. At the same time appraisals of ground water resources will be made in select areas directed chiefly at the research aspect of the Branch's work, and to the dissemination of basic hydrogeologic data usable by the (public.

NO	DESCRIPTION OF PHASES OR MAJOR STEPS	TARGET DATES START	TARGET DATES COMPLETION	TIME PLAN FY-68	TIME PLAN FY-69	REMARKS
1	To train Brazilian geologists and assist in the development of Brazilian institutions to carry out the work of exploring, evaluating and developing ground water resources in select areas of Brazil.	7/67	6/69	xxxxxxxxxxxxxxxxxx		
2	Conduct hydrogeological research investigations under long range plans involving large areas.	7/67	6/69	xxxxxxxxxxxxxxxxxx		
3	Conduct intensive investigations of basins or areas where irrigation by wells appears to be feasible, and elaboration of the plans and arrangements for demonstrating that ground water in sufficient quantity and satisfactory quality for irrigation is present.	7/67	6/69	xxxxxxxxxxxxxxxxxx		
4	Prepare and publish maps and reports on all hydrogeological investigations and basic hydrogeologic data usable by the public and for other functional development plans for industry and agriculture.	7/67	6/69	xxxxxxxxxxxxxxxxxx		

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USAID/BRAZIL FORM 1-6

IMPLEMENTATION PLAN

PART IV. PERSONNEL REQUIREMENTS

COOPERATING COUNTRY	ACTIVITY TITLE	NO	E-1 PROJECT NO	DATE PREPARED	COP
BRAZIL	NATIONAL MINERALS SURVEY GROUND WATER PROJECT			12/12/66	ORIGINAL

STEP NO.	POSITION OR SPECIALTY, GRADE AND SALARY	NO	TYPE [1]	PLANNED ARRIVAL DATE	TIME SPAN FY-67	FY-68	FY-69					REMARKS
1-4	Ground-Water Geologist Project Chief FC-4 $17,500	1	PASA USGS	present	xxxxxxxx	xxxxxxxx	xxxxxxxx					
1-4	Ground-Water Geologist FC-5 $ 15,500	1	PASA USGS	present	xxxxxxxx	xxxxxxxx	xxxxxxxx					
3	Technician, Expert well-drilling supervisor (tool pusher) FC-6 $ 14,000	1	DH or UPS	7/67		xxxxxxxx	xxxxxxxx					
3	Technician, Expert on new reverse-circulation hydraulic-rotary drill FC-6 $ 14,000	1	UPS (TDY)	7/68			xxxxxxxx					

[1] [illegible]

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USAID/BRAZIL FORM 1-3

IMPLEMENTATION PLAN

PART V. PARTICIPANT REQUIREMENTS

COOPERATING COUNTRY: BRAZIL

DATE PREPARED: 12/12/66

COPY: ORIGINAL

ACTIVITY TITLE: NATIONAL MINERALS SURVEY GROUND WATER PROJECT

NO.

EX PROJECT NO.

LINE NO	FIELD OF TRAINING	NO	TIME SPAN FY-67	FY-68	FY-69			MAN MO	DOLLAR COSTS
	Graduate academic study at selected universities and in-service training at U.S. Gov't facilities.	2		XXXXXXXX				24	$15,000 (DX funding)
	Graduate academic study at selected universities and in-service training at U.S.Gov't facilities.	2			XXXXXXXX			24	$ 16,000 (DL funding)

USAID/BRAZIL FORM 16

IMPLEMENTATION PLAN

PART VI. COMMODITY REQUIREMENTS

COOPERATING COUNTRY: BRAZIL

DATE PREPARED: 12/12/66

COPY: ORIGINAL

ACTIVITY TITLE: NATIONAL MINERALS SURVEY GROUND WATER PROJECT

NO.

ST PROJECT NO.

STEP NO.	DESCRIPTION	TOTAL COST	COSTS BY FISCAL YEAR ($US THOUSANDS) FY-68	FY-69				[1] TYPE	REMARKS
	U.S. $ Procurement in U.S. with DL Funding								
	Reverse-circulation rotary hydraulic drill w/spare parts and tools	41	41	-					
	Spare parts and tools for 14 percussion and 3 rotary drills now on hand	40	40	-					
		81	81	-					
	Local Procurement with Cr$ Loan Funds								
	Field equipment including field vehicles in support of field operation	10		10					

[1] INDICATE BY LETTER WHETHER COMMODITIES ARE: A — AID DIRECT
B — OTHER U.S. AGENCIES, OR C — CONTRACT

USAID Draft Form

IMPLEMENTATION PLAN

PART II. WORK SCHEDULE

Cooperating Country	Date Prepared	Copy
BRAZIL	11-20-66	Original

Responsible AID Official/Project Coordinator	AID Office	Purpose of Activity
	ENRO	To assist the Department of Water and Energy of the Ministry of Mines and Energy to build up a permanent well-trained organization and program capable of collecting, compiling and processing the hydrologic data which is urgently needed for all water development and water use studies.

Responsible Cooperating Country Agency: Department of Water and Energy, Ministry of Mines and Energy

Date: Prodag Signed / Loan Authorized / Loan Signed

E.I. Project No.:

Activity Title: Hydrologic Data Collection and Analysis

No.: 252

No.	Description of Phases or Major Steps	Target Dates: Start	Target Dates: Completion	FY-67	FY-68	FY-69	FY-70	FY-71	FY-72	Remarks
1	Negotiating and processing project agreement for loan financing	June '68		xxxxx						
2	Improvement of practices, methods, procedures by in-service training	July '67	June '72							Continuing
3	Procurement of equipment and materials for improvement and expansion of program including [illegible]	July '67	June '72							
4	Expansion of streamflow, [illegible] [illegible] and sediment [illegible]	July '67	[illegible] '72							Continuing
5	Computation, compilation and publication of [illegible] streamflow, rainfall and other data (about 5000 station-years)	July '67	[illegible]							
6	Computation, compilation & publication of data on current basis (annually)	July '67	[illegible]							Continuing

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USAID/BRAZIL FORM 1-4

IMPLEMENTATION PLAN
PART IV. PERSONNEL REQUIREMENTS

COOPERATING COUNTRY	ACTIVITY TITLE	NO	B.1 PROJECT NO
BRAZIL	Hydrologic Data Collection and Analysis	252	

STEP NO.	POSITION OR SPECIALTY, GRADE AND SALARY	NO.	TYPE [1]	PLANNED ARRIVAL DATE	TIME SPAN FY-67	FY-68	FY-69	FY-70	FY-71	FY-72	REMARKS
1-6	Hydrologist (Proj. Coord) FC-5 ($16000 p.a.)	1	PASA	Mar.67	XX X XX	XXXXXXXXX	XXXXXXXXX	XXXXXXXXX	XXXXXXXX		Glen Mesnier to replace F.LeFever;L.Snell on TDY Nov. 1966
2-6	Hydrologist FC-6 ($12,500 p.a.)	1	PASA	on board	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX		Wm. Curtis on board as advisor in Northeast
2-6	Hydraulic Engineer FC-6 ($12,500 p.a.)	1	PASA	Jan. 67	XXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXX		Carl Lawrence nominated
2	Hydrologist (GS-13 or 14) (Special consultants on short term assignments)		PASA			X	X	X			60-day details
1-6	Clerk - Typist (Local hire) (3,000 p.a.)	1	LDH			XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXXX		For USAID and USGS clerical duties

Project on Grant Funds to June 1967

[1] Indicate by letter whether DH — U.S. direct hire, PASA — participating agency service agreement, UC — U.S. institutional contract, LDH — local direct hire, LC — local institutional contract, UPS — U.S. personal services contract, LPS — local personal services contract, or GOB — Government of Brazil

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USAID/WASH FORM 63

IMPLEMENTATION PLAN

PART V. PARTICIPANT REQUIREMENTS

COOPERATING COUNTRY: BRAZIL

DATE PREPARED: 11-20-66

COPY: ORIGINAL

ACTIVITY TITLE: Hydrologic Data Collection and Analyses

STEP NO	FIELD OF TRAINING	NO	FY-67	FY-68	FY-69	FY-70	FY-71	TYPE [1]	REMARKS
2-6	Organization and Management study for Director-General of Department of Water and Energy.	1	1					A	$3,000 FY-67 Funding DG
2-6	Hydraulic and hydrologic training in US for advanced, or key, engineers, in U.S. with USGS	19		5		5	9	A	162 man-mos. $105,000 Funding DL
2-4	Sediment and chemical field and laboratory study in U.S., with USGS.	5			2	2	1	A	40 man-mos. $22,000 Funding DL
2,3, 6	Data Computation by computer, in U.S., with USGS.	3			1	1	1	A	24 man-mos. $18,000 Funding DL
2	Administration and organization; for District or Section chiefs, in U.S. with USGS.	6		2		2	2	A	24 man-mos. $20,000 Funding DL

Note: Figures in above are number of participants in a group.

[1] INDICATE BY LETTER WHETHER PARTICIPANTS ARE A — U.S. AGENCIES OR C — CONTRACT

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USAID/BRAZIL FORM 1-6

IMPLEMENTATION PLAN

PART VI. COMMODITY REQUIREMENTS

COOPERATING COUNTRY: BRAZIL

DATE PREPARED: 11-20-66

COPY: ORIGINAL

ACTIVITY TITLE: Hydrologic Data Collection and Analyses

NO.

F.Y. PROJECT NO.

STEP NO.	DESCRIPTION	TOTAL COST	COSTS BY FISCAL YEAR (US$ THOUSANDS) FY-68	FY-69	FY-70	FY-71	FY-72	TYPE [1]	REMARKS
	U.S.$ Procurement in U.S. - DL Funding								
2-4	Streamgaging instruments and equipment for field use	90	30	25	20	15		B	See note below
2-4	Water-stage recorders and other U.S.-obtained scientific instruments (rainfall, wind)	236	50	50	50	50	36	B	
2-4	Sediment laboratory equipment	20	10	10				B	
		346	90	85	70	65	36		
	Brazilian Procurement through DL Funding (U.S.$ Equivalent)								
2-4	Rain gages, evaporation pans cableway equipment, instrument shelters, etc.	250		60	60	80	50	*	See note below
2-4	Telecommunications equipment and installation	15		15				*	
6	Offset Printer and microfilm unit, and installation	5		5				*	
5	Back-data computations by contract to local consulting firm.	320		100	100	70	50	*C	
3,6	Office equipment and machines	35		15	15	5		*	
		625		195	175	155	100		

Note: Brazilian manufactured equipment for streamflow studies, following USGS designs, cost about double the cost of U.S. supplied instruments. Adjustment of prices may change the above somewhat.

* Denotes national, or local, procured and manufactured equipment.

[1] INDICATE BY LETTER WHETHER COMMODITIES ARE: A — AID DIRECT, B — OTHER U.S. AGENCIES, OR C — CONTRACT

SAID STATE FORM 2

IMPLEMENTATION PLAN

PART II. WORK SCHEDULE

COOPERATING COUNTRY	[illegible]IL
DATE PREPARED	11-[illegible]-66
COPY	ORIGINAL

RESPONSIBLE AID HIGH/PROJECT COORDINATOR	AID OFFICE [illegible]/Rio
PURPOSE OF ACTIVITY	To assist the [illegible] Photogrammetric Services Section of [illegible] by [illegible] training and training service and [illegible] development and control [illegible] other natural resources studies.
RESPONSIBLE COOPERATING COUNTRY AGENCY	Department of Water and Energy (of Ministry of Lands and Energy)
DATES: PROAG SIGNED / LOAN AUTHORIZED / LOAN SIGNED	
EX PROJECT NO	
ACTIVITY TITLE	Photogrammetric Services
NO	

NO	DESCRIPTION OF PHASES OR MAJOR STEPS	TARGET DATES START	TARGET DATES COMPLETION	TIME SPAN FY-67	FY-68	FY-69	FY-70	FY-71	FY-72	REMARKS
1	Improvement of [illegible] in aerial photography, [illegible] and aerial [illegible] control, adjustment, plotting, and [illegible]-production.	July '67	June [illegible]		[illegible]					By in-service and participant training.
2	Procurement of [illegible] for the improvement and [illegible] of program, including stereo [illegible], camera, [illegible].	July '67	[illegible]		[illegible]					
3	Expansion of [illegible] from [illegible] 5,500 - 8,000 km² per month to [illegible] per month [illegible] and other maps for 1:25,000 scale, and other [illegible] detailed, maps.	July [illegible]	[illegible]		[illegible]					By [illegible]

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IMPLEMENTATION PLAN

PART IV. PERSONNEL REQUIREMENTS

Cooperating Country: BRAZIL

Activity Title: Photogrammetric Services

11-20-66

ORIGINAL

STEP NO.	POSITION OR SPECIALTY GRADE AND SALARY	NO.	TYPE	PLANNED ARRIVAL DATE	FY-67	FY-68	FY-69	FY-70	FY-71	FY-72	REMARKS
1-3	Topographic (photogrammetric) Engineer (Proj. Coord.) FC-4 ($17,500 p.a.)	1	U.S.	Sept. 67		xxx	xxx	xxx			No nominations as yet. Advisors to be from USGS Topographic Division
1-3	Topographic (aerial photo & aero triangulation) Engineer FC-5 ($14,500 p.a.)	1	U.S.	Mar. 68			xxx	xxx			
1-3	Photo-interpretation specialist Engineer FC-5 (14,500 p.a.)	1	U.S.	July, 68							
1-3	Clerk-typist (Local Hire) ($3,000 p.a.)		LDH	Jan. 68		xxx	xxx	xxx		xxx	

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USAID/BRAZIL FORM 11

IMPLEMENTATION PLAN

PART V. PARTICIPANT REQUIREMENTS

COOPERATING COUNTRY: Panama

DATE PREPARED: 11/20/66

COPY: ORIGINAL

ACTIVITY TITLE: PHOTOGRAMMETRIC SERVICES

NO.

U.S. PROJECT NO.

SPU NO	FIELD OF TRAINING	NO	FY-68	FY-69	FY-70	FY-71	FY-72	J TYPE	REMARKS
1-3	Aerial photography, photo-laboratory; electronic vertical & horizontal control methods; color and infra-red mapping.	5	I	I	I	I	I		8 man-mos. in US with USGS; and 12 man-mos. with IAGS in Canada.
1-3	Stereoplotting, map restitution, horizontal and vertical control methods and control procedures.	10	I	I	I	I	I		10 man-mos. with USGS 28 man-mos. with IAGS in Canada
1-3	Photo interpretation, and use of infra-red and other processes.	12	I	I	I	I	I		14 man-mos. with USGS 36 man-mos. with IAGS in Canada
1-3	Operations and management of mapping organization	1	I						4 man-mos. with USGS in US
1,3	Photo-processing photo lab. techniques	4	I	I	I	I			6 man-mos. in US 6 man-mos. in Canada
1-3	Ground surveys; vertical and horizontal control		I	I	I	I	I		8 man-mos. in US 24 man-mos. in Canada
		40							

~~Notes: The USGS is the agency responsible for all mapping in the U.S. However, USGS does primary control. Info comes out saying in Central and South America. To improve the time and cost of Spanish language training it is proposed that the Spanish language training in Panama be used for training Brazilians without English-language proficiency.~~

J INDICATE BY LETTER WHETHER PARTICIPANTS ARE A — U.S. AGENCIES OR C — CONTRACT

USAID/BRAZIL FORM 1-6

IMPLEMENTATION PLAN

PART VI. COMMODITY REQUIREMENTS

COOPERATING COUNTRY: BRAZIL

DATE PREPARED: 11/20/66

COPY: ORIGINAL

ACTIVITY TITLE: DNAE - Photogrammetric Service

NO.:

A.I. PROJECT NO.:

STEP NO.	DESCRIPTION	TOTAL COST	COSTS BY FISCAL YEAR (US$ THOUSANDS) FY-68	FY-69	FY-70	FY-71	FY-72	TYPE [1]	REMARKS
	U.S.$ Procurement in U.S. with DL Funding								
	Airplane, for aerial photography (Cessna 411 or equal) with automatic pilot, etc.	360	180		100				
	Autographs, stereo-plotters, (Model A-9 and A-7, or equal)	103	36	67					
	Computer, electronic register (EK-5, or equal)	26		26					
	Aviograph (B-9 and B-8, or equal)	60	30		30				
	Photo rectifier (E-4, or equal)	30		30					
	Profile recorder (APR, or equal)	100			100				
	Printers, Aerial photo (Mark II and sp-10/70)	44		44					
	Additional equipment	100				100			
	" "	50					50		
		873	246	167	310	100	50		
	All of above-listed instruments and equipment are to be procured from U.S. sources, some Swiss equipment included is also used by U.S. agencies.								
	Local and Third Country Procurement with DLAE Funds								
	Aerial cameras (RC-9 and RC-8, or equal)	41	20	21					
	Tellurometers	39			39				
	Aerial photo electronic printer (U-A, or equal)	18	18						
	Platform, etc. for above (PAV-2 and HR1, or equal)	29	15	14					
	Related equipment	14		14					
	Additional equipment	35			22	14			
	Total	177	53	49	61	14			

[1] INDICATE BY LETTER WHETHER COMMODITIES ARE A — DIRECT, B — OTHER U. S. AGENCIES, OR C — CONTRACT

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USAID GRATIS FORM 12

IMPLEMENTATION PLAN

PART II. WORK SCHEDULE

COOPERATING COUNTRY		DATE PREPARED: 11/20/66	COPY: ORIGINAL

RESPONSIBLE AID DIVISION/PROJECT COORDINATOR	AID OFFICE	PURPOSE OF ACTIVITY	DATES: PROAG SIGNED / LOAN AUTHORIZED / LOAN SIGNED	A.I. PROJECT NO
	LA/DR/Rio	To improve the [illegible] of the small, important [illegible] so they may [illegible] their activities in the control and [illegible] of water and water; power [illegible], power dispatching, water [illegible], and water [illegible] control.		

RESPONSIBLE COOPERATING COUNTRY AGENCY	ACTIVITY TITLE	NO
Department of [illegible] (Ministry [illegible])	[illegible]: Co[illegible], [illegible], [illegible], [illegible]	

NO	DESCRIPTION OF PHASES OR MAJOR STEPS	TARGET DATES: START	TARGET DATES: COMPLETION	TIME SCALE: FY-67	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	REMARKS
1	Division of [illegible] with Federal [illegible], [illegible], other control [illegible] not [illegible] [illegible].									
2	Division of [illegible] partici[illegible] in U.S. [illegible], [illegible], Solicitor [illegible], [illegible], etc.									
3	[illegible] training in U.S.; U.S. [illegible]; [illegible] procedure [illegible].									
4	[illegible] training [illegible] and [illegible] organizations [illegible], [illegible], [illegible])									

TRANSMITTED: AID/W [illegible] Page [illegible] of [illegible]

Best Available Document

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USAID-BRAZIL FORM 1-4

IMPLEMENTATION PLAN

PART IV. PERSONNEL REQUIREMENTS

COUNTRY OR CONTINENT	PROJECT TITLE	NO	REVISION NO	DATE PREPARED	COPY
Brazil	Water Resources Development Statistical Support			11/30/66	ORIGINAL

STEP NO.	POSITION OR SPECIALTY, GRADE AND SALARY	NO	TYPE [1]	PLANNED ARRIVAL DATE	FY-67	FY-68	FY-69	FY-70	FY-71	FY-72		REMARKS
3	Statistical (power) services Engineer FC-4 (GS-14) (17,500 p.a.)	1		Jan. 68		TAA						6 mos. Det 11 of Federal Power Commission or TVA statistical expert.

[1] Indicate by letter whether DH — U.S. direct hire, PASA — participating agency service agreement, UC — U.S. national or contract, LDH — local direct hire, LC — local national or local contract, UPS — U.S. personal service contract, LPS — local personal service contract, or GOB — Government of Brazil.

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USAID/BRAZIL FORM 1-8

IMPLEMENTATION PLAN

PART VI. COMMODITY REQUIREMENTS

COOPERATING COUNTRY	DATE PREPARED	COPY
BRAZIL	11/20/66	ORIGINAL

ACTIVITY TITLE: DNAR: Combined Tariffs, Licenses, Statistical and Administrative Services

NO.

T.I PROJECT NO.

STEP NO.	DESCRIPTION	TOTAL COST	COSTS BY FISCAL YEAR (US$ THOUSANDS) FY-68	FY-69	FY-70	FY-71	FY-72	[1] TYPE	REMARKS
	Local Procurement through D.L. Fundings (equivalent U.S.$)								
3	Statistical data processing Computer (NCR 395 and 500, Burroughs 500 & B-2500, or IBM-6400, or equal)	78	78						

[1] INDICATE BY LETTER WHETHER COMMODITIES ARE A — AID DIRECT, B — OTHER U.S. AGENCIES, OR C — CONTRACT

USAID BRAZIL FORM 1-3

IMPLEMENTATION PLAN

PART V. PARTICIPANT REQUIREMENTS

COOPERATING COUNTRY: BRAZIL

DATE PREPARED: 11/20/66

COPY: ORIGINAL

ACTIVITY TITLE: DNAE: Combined Tariffs, Licenses, Statistical and Administrative Services

NO.

U.S. PROJECT NO.

STEP NO	FIELD OF TRAINING	NO	FY-68	FY-69	FY-70	FY-71	FY-72	MAN NO	DOLLAR COSTS
1	Study of power rates, benefit-cost ratios, etc. with FPC, TVA, REA.	20	4	4	4	4	4		80 Man-mos. $75,000 DL Funding
2	Power licensing, water rights; with TVA, FPC, BuRec, Solicitors office, etc.	8	2	1	2	1	2		24 man-mos. $24,000 Funding DL
2	Power dispatching, interconnection, control; rural electrification	7	1	2	1	2	1		21 man-mos. $21,000 DL Funding
3	Statistical services and control as pertains to electric power, with TVA, BuRec, FPC	4			4				16 man-mos. $15,000 DL Funding
4	Administration and Management of power and water agency; TVA, BuRec, REA	5	1	2	2				30 man-mos. $25,000 DL Funding
									171 man-mos.

Note: Numbers in boxes, above, denote number of participants in group training

LOAN AUTHORIZATION D R A F T

Provided From: Alliance for Progress Funds
BRAZIL--Mineral and Water Resources Program

Pursuant to the authority vested in the Deputy U.S. Coordinator, Alliance for Progress by the Foreign Assistance Act of 1961, as amended, and the delegations of authority thereto, I hereby authorize the establishment of a loan, pursuant to Part I, Chapter 2, Title VI, Alliance for Progress, of said Act, to the Government of Brazil ("Borrower") of not to exceed nine million two hundred thousand United States dollars (US$9,200,000) to assist in financing (1)surveys of mineral and water resources by the National Department of Mineral Production (DNPM) and the National Department of Water and Energy (DNAE), (2) technical assistance to the DNPM and DNAE, and (3) equipment for the DNPM and DNAE ("Program").

This loan shall be subject to the following terms and conditions:

1. Interest and Terms of Payment

Borrower shall repay the loan to the Agency for International Development ("A.I.D.") within forty years from the first disbursement under the loan, including a grace period of not to exceed ten years. Borrower shall pay to A.I.D. in United States dollars on the disbursed balance of the loan interest at the rate of one (1) percent per annum during the grace period and two and one-half ($2\frac{1}{2}$) percent per annum thereafter.

2. Other Terms and Conditions

a. As conditions precedent to the first disbursement of the loan, Borrower shall submit to AID for approval:

(1) a detailed breakdown of the financial contribution which Borrower shall make to the Program; and

(2) a detailed work plan for the Program for the first year of operation.

b. United States dollars utilized under the loan to finance local currency costs shall be made available to the Borrower or its designee through the Special Letter of Credit procedure and shall be used only for procurement in the United States.

c. Equipment, materials and services (except shipping and marine insurance financed under the loan) shall have their origin in and be procured from the United States or Brazil. Shipping financed under the loan shall be procured in the United States, and marine insurance financed under the loan shall be placed in the United States with a company authorized to do business in any state of the United States.

d. Borrower shall use for the Program, in lieu of any United States Dollars that would otherwise be disbursed under the loan to finance the Brazilian currency costs of this Program, any currencies that may become available to Borrower after the date of this Agreement in connection with assistance (other than the loan) provided by the United States of America to Borrower, provided that currencies may be used for such purpose.

e. The loan shall be subject to such other terms and conditions as A.I.D. may deem advisable.

_____
Deputy U.S. Coordinator
Alliance for Progress

_____
Date