

**CANADA-BRAZIL TECHNOLOGY
TRANSFER FUND**

NORTHEASTERN BRAZIL GROUNDWATER PROJECT

Program Environmental Analysis

Submitted to

**THE CANADIAN INTERNATIONAL DEVELOPMENT AGENCY
(CIDA)**

by

**GEOLOGICAL SURVEY OF CANADA
(GSC)**

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Introduction

A proposal for a project entitled "Northeastern Brazil Groundwater Project" was submitted to the Canadian International Development Agency (CIDA) in November 1999, to be considered for funding under CIDA's Canada-Brazil Technology Transfer Fund. The proposal was given a very positive evaluation by the reviewers and, in January, it received ministerial approval. However, the proposal document did not include an environmental screening section which is mandatory for all projects in which the federal government is involved, including projects implemented abroad. The present document is intended to fill this gap.

Although there was no environmental analysis of the project per se included with the proposal document, the project was developed with a great deal of consideration for both environmental and social issues. The project will be implemented with input from a large number of partners and participants, both Canadians and Brazilians. Many of these partners and participants in both countries will be joining with the specific mandate to deal with environmental issues, not only to ensure that the project is implemented free of adverse environmental effects, but also with a view to improve the environmental situation in the project area.

Groundwater resource development, which is what this project is about, requires, more than any other type of development, to be carried out following strict environmental guidelines in order to produce satisfactory results. After all, water is one of the most important elements in the environment. A sound environment is often equated to an environment in which the water is clean. Canadian specialists in groundwater resource development are well aware of this, and most of those who will be involved in the project have a great deal of experience in dealing with water issues in an environmental context. This Canadian expertise will be applied to build capacity in this area within Brazilian organizations.

The present document was prepared following CIDA's "Handbook on Environmental Assessment of Non-Governmental Organizations and Institutions Programs and Projects", hereinafter referred to as the Handbook. We find the Handbook to be very clear and most successful at conveying the message that environmental considerations need to be integrated in all government programs and projects. We intend to comply fully with every aspects of the regulations and, whenever opportunities arise, go beyond the requirements by introducing innovative approaches that will lead to an improved environment in northeastern Brazil. The project will be well suited to build institutional, technological and human resource capacities for dealing with environmental matters in northeastern Brazil, and to bring corrective measures to existing environmental problems in the region.

Program or Project?

Even though the "Northeastern Brazil Groundwater Project" is referred to as a project, it should be considered as a program under the definition in the Handbook: it has a long (three-year) time frame, it is broad in scope (about a dozen disciplines or areas of activities in three states) and includes a number of activities or projects. Details of these activities will not be known until the project is launched. At present, we do not know, except in a very general way, which activities will be carried out, when and in what sequence, and where. Neither do we know at this time precisely what each activity will entail. These decisions will be taken as the program progresses based on the results of earlier activities. For these reasons, we can only produce an environmental analysis of the program at the present time; it would not be feasible to develop a project environmental analysis as defined in the Handbook, or an environmental assessment as may be required under the Canadian Environmental Assessment Act (CEAA).

The Northeastern Brazil Groundwater Project

This section of the document is intended to provide only enough information for the reader to understand how the program will be structured and delivered and, in a general way, how activities may impact the environment. Further details can be found in the actual project proposal document and in two accompanying volumes entitled "*Expressions of Interest from Canadian Firms and Public Institutions*" and "*Project Proposals from Brazilian Partners and Participants*". These two volumes contain declarations from potential participants in the project and many of them highlight the environmental mandate and activities of their organizations.

The program will be implemented simultaneously in three states of northeastern Brazil (Ceará, Pernambuco and Rio Grande do Norte) and will consist initially of basic hydrogeological and related studies that have no environmental impact. These may include measuring rock and soil properties using surface (geophysical) equipment, sampling the water from existing wells to study its composition, or studying remote sensing data (i.e. satellite images) with computers in an office environment. Canada will provide state-of-the-art technologies to improve the results of these essentially non-impacting project activities, in an effort to identify areas or "targets" where conditions are appropriate for the development of the groundwater resources for the benefit of the population.

Canada will transfer this technology to Brazil initially by having its specialists conduct lecture tours and perform demonstrations of equipment and computer software in the lab or in the field. There may be occasions when testing the technology will require drilling a test well or pumping water from an existing

well (to measure drawdown, for example) but essentially, this aspect of the program involves no "physical work" and will have no environmental impact.

If the Canadian technologies prove to be useful at identifying targets for groundwater resource development, there will be recommendations made to the local waterworks companies for groundwater development projects. These projects will involve mostly Brazilian labour and equipment with input of Canadian expertise as required. These projects will likely include "physical work" such as drilling wells, trenching, building dams, or the construction of desalinization plants. Any work done under the auspices of the CIDA program, however, will remain "pilot-scale" or "experimental" in scope. Wide-scale implementation of the technology may occur, but this is unlikely to take place before the end of the CIDA project.

The Brazilian waterworks companies which will be called upon to implement development projects, are mostly government owned enterprises that have been managing water resources in northeast Brazil for many years. They are well established, have a good track record and operate under strict environmental guidelines. Nevertheless, these projects should be subjected to Project Environmental Analysis as defined in the Handbook, and possibly Environmental Assessment under the CEAA.

In addition to the transfer of "high" technologies, the program also includes important social and environmental components, which will focus on improving our understanding of these issues, and finding corrective measures to existing adverse conditions. Also, the social and environmental components will ensure that the activities carried out as part of the technology component of the project responds to social needs and have a desirable environmental impact. These components will be implemented mostly by Brazilian government organizations and NGOs with input from Canadian specialists as required. Activities will include community education in areas such as sanitation, hygiene, waste disposal, water conservation and self-sufficiency; environmental awareness; simple water system maintenance training; aquifer protection and soil vulnerability studies; water quality and its impact on health; proper disposal of brines from desalinization plants, etc. Although most of these projects will undoubtedly have positive environmental effects, some may require environmental analysis or assessment if they involve any physical work with uncertain environmental consequence.

Dealing with Environmental issues at Natural Resources Canada (NRCan)

The environment, and ensuring that all NRCan activities are carried out in an ecologically sound manner is a very high priority in the department. The GSC is subjected to all the rules and regulations that make up NRCan's environmental policy.

NRCan is considered a leader in environmental management in Canada and provides amongst the highest standard of environmental assessment, program evaluation, training and training manuals, electronic assessment filing system, etc. Environmental assessment activities are coordinated through the Office of Environmental Affairs (R. Arseneault, Manager; Tel: 995-3420) and there are representatives of the Office in each sector. At the GSC, the representative is Margo Burgess (Tel: 996-9317).

NRCan's Office of Environmental Affairs will be available for consultation on matters concerning environmental aspects of the Northeastern Brazil Groundwater Project, and will provide assistance and expertise in preparing any environmental assessment that may be required during the course of the program. In addition, the Office offers training and courses on environmental assessment and other issues, which will be useful to build relevant capacity within Brazilian partner organizations.

Further information on NRCan's environmental assessment activities and on the Office of Environmental Affairs can be found in the accompanying report in the Appendix. In addition, NRCan hosts an excellent environmental web site, where information on all aspects of the department's environmental activities can be found: http://www.nrcan.gc.ca/css/amas/oea/emp/oea1/environment_health_and_safety.html

In addition to in-house expertise, the project will have access to a wide range of private and public sector expertise from organizations that have expressed interest in participating in the program. Water being a commodity that is so closely related to the environment, most commercial firms who offer technical expertise on water resource development also offer related environmental services¹.

¹ In the volume entitled "*Expressions of Interest from Canadian Firms and Public Institutions*" submitted as part of the project proposal, see, for example: Fracflow Consultants (Part 5, #1); Lakefield Research (Part 9, #1); North-South Environmental Inc (Part 7, #2); SRK Consulting (Part 8, #1); Jacques Whitford Environment Ltd (Part 7, #3); Rescan Environmental Services (Part 4, #3); AGEOS (Part 2, #2); Washburn & Gillis Associates Ltd. (Part 9) and others.

Ensuring adequate environmental consideration during project planning and implementation

In order to ensure that environmental factors are taken into account during project planning and implementation, the following measures will be adopted:

1. The project's management team will work closely with NRCan's Office of Environmental Affairs to ensure that the Government of Canada's policies and regulations are properly adhered to;
2. Environmental impact will be given priority status whenever meetings are held with partners and project participants to decide on specific project activities;
3. Project environmental analysis will be done as part of individual project planning process and, if required, environmental assessment will be performed in accordance with the CEAA;
4. Whenever deemed necessary, in-house specialists or consultants will be taken to the project site in order to be better able to evaluate the environmental impact of certain activities or projects, particularly those involving substantial physical work;
5. Projects that are considered of high environmental risk, and for which no satisfactory alternate approaches are found, will be cancelled.

An environmental plan will be developed as part of the inception phase of the project, and the plan itself will be included in the Inception Report to be submitted to CIDA at the end of the inception phase. The inception phase is expected to last from 3 to 6 months after the signature of the contribution agreement between CIDA and GSC. This will allow to hold further discussions with our Brazilian partners and to obtain information that may have a significant impact on the environmental component of the project, such as better knowledge of Brazilian federal and local laws and regulations, policies, strategies, programs, etc.; better knowledge of where authority on environmental matters resides in Brazil; which organizations can provide environmental management to the program; and which organizations can benefit from capacity building activities in that area.

Conclusion

The management team for this program is fully aware of the importance of the environmental impact associated with program activities, and intends to comply fully with Government of Canada regulations in this area. The project has a real potential of bringing considerable environmental benefits to northeastern Brazil because it focuses on developing clean water resources for the population and on correcting existing adverse environmental conditions in the region. Capacity building of Brazilian institutions in environmental disciplines is also a prime objective of the program. GSC as part of NRCan has access to one of the top environmental protection and assessment programs in the country, and the project will draw from a vast pool of experience in environmental matters that resides in the Canadian private sector. This environmental analysis is the first step towards full implementation of Government of Canada's environmental guidelines and regulations. It is the only step that can be taken at this time because details of individual projects or activities are not yet known.

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