I. General Criteria

1. **Project Type.**

The project consists of the consolidation of the water and sanitation systems, through the expansion of water distribution and wastewater collection lines; rehabilitation of lines in poor condition, rehabilitation of the wastewater treatment plant; and other minor works, such as the installation of chlorination equipment in distribution tanks, and purchasing operation and maintenance equipment.

2. **Project Location.**

The City of Tecate is located in the State of Baja California, approximately 40 km east of Tijuana. To the north of the city lies the community of Tecate, California. The project's entire area of influence is located within the 100 km border region. Estimates indicate that in 1999, the population of Tecate was 67,006, while it is expected to reach 246,738 by 2020.

3. **Project Description and Work Tasks**

The proposed project entails the expansion of the water distribution and wastewater collection systems to areas that currently lack these services. Additionally, it includes the rehabilitation of the wastewater treatment plant, and other minor works.

The project consists of a three-year investment program with 54 actions, as described in Table 1-1. It must be noted that the works scheduled for 1999 have been implemented by the project applicant, the Comisión Estatal de Servicios Públicos de Tecate (CESPTe), with state and federal funding. Thus, BECC certification for these components is not being pursued. Nonetheless, these works have been included in the description because CESPTe expects that such investments will be considered as part of the Mexican match for implementation of the three-year project.

TABLE 1-1
PROJECT ACTIONS

1999	2000	2001
POTABLE WATER	**POTABLE WATER**	**POTABLE WATER**
1) Replace meters *2) Relocate meters* *3) Install new meters* *4) Build distribution system for colonias Tecate II & III* *5) Replace Distribution lines for Col. La Viñita* *6) Build distribution system for Col. Santa Fe* *7) Build Storage Tank Fundadores & Conveyance Line* *8) Build distribution system for San José* *9) Replacement of distribution lines for Apatzingán* *10) Chlorination system at Well PB-4* *11) Replacement of steel transmission line Carrizo-Cuchú* *12) Install chlorinators at storage tanks* *13) Replace pumping equipment*	*17) Replace water distribution lines* *18) Replace meters* *19) Relocate meters* *20) Install new meters* *21) Build distribution system for Col. Colosio* *22) Build distribution system for Fracc. Fundadores* *23) Build distribution system for Col. Valle Verde* *24) Build distribution system for Col. Lombardo Toledano* *25) Build distribution system for Fracc. Escudero* *26) Replace pumping equipment* *27) Build distribution system for Col. Granjas Garzón* *28) Build distribution system for Col. Maclovio Herrera*	*38) Replace meters* *39) Relocate meters* *40) Replace distribution lines* *41) Backwash water recovery tank at the Nopalera WTP* *42) Install meters at the new connections* *43) Garzón regulating tank* *44) Conveyance line and re-pumping to Col. Garzón*
SEWAGE & SANTITATION	**SEWAGE & SANITATION**	**SEWAGE & SANITATION**
14) Collection system for Col. La Bondad *15) Collection system for Col. Emiliano Zapata II* *16) Collection system for Col. Rincón Tecate*	*29) Maclovio Herrera Collector* *30) Aeropuerto Stage II Collector* *31) Collection system for Col. La Viñita* *32) Collection system for Col. Santa Fe* *33) Collection system for Col. Rincón Tecate* *34) Collection system for San José* *35) Collection system for Col. Maclovio Herrera* *36) Machinery and Equipment* *37) Improvements to the WWTP*	*45) Descanso Stage II Collector* *46) 1o. de Mayo Collector* *47) Norte Collector* *48) Col. Colosio System* *49) Col. Villa Verde System* *50) Col. Lombardo Toledano System* *51) Fracc. Escudero System* *52) Fracc. Fundadores System* *53) Col. Granjas Garzón System* *54) Machinery and equipment*

The implementation of this project will allow CESPTe to provide potable water and sanitation service to practically 100% of the population. Currently, approximately 8% (5,899) of the community lacks piped water service, while approximately 16% (10,977) of the community lacks sewage and sanitation services.

Potable Water Distribution System

Water is supplied to various colonias by means of water trucks, operated either by the city or private individuals. This supply source, however, presents three main problems: it is difficult to control the quality of the water being supplied; users store water in inadequate containers, which may result in contamination, and; private water suppliers charge rates much higher than those established by CESPTe for piped water services.

The project includes 32 components aimed at expanding and improving operations of the potable water system. Among other benefits, the project will provide water service to approximately 5,899 residents currently lacking this service, increasing service coverage to practically 100% of the community. Additionally, 5,200 new users will be incorporated to the system as the areas being benefited grow. This will be achieved through construction of 27,028 m. in distribution systems and 2,726 new connections.

Wastewater Collection System

As described above, several areas of the city lack water and sewerage services. Residents of these areas meet their wastewater disposal needs by means of latrines, septic tanks, and open ditches, posing risks to human health and the environment.

The project will provide sewage services to approximately 10,977 residents that currently lack this service, increasing service coverage to practically 100% of the community. Additionally, service will be provided to 4,300 future residents, as the population in benefiting areas increases. This will be achieved through the construction of 28,397 m in wastewater collection lines, and 3,718 new connections.

Wastewater Treatment System

The WWTP provides treatment by means of trickling filters. The plant is experiencing several operational problems. The proposed works will improve plant operations while maintaining the same type of treatment process. Improvements will focus on the following unit processes: screens, influent pump, distribution box, primary clarifiers, trickling filters, secondary clarifiers, chlorine contact tank, sludge pumps, sludge digester, and sludge press filter. Some of the proposed improvements are relatively simple, such as installation of baffles in the reactors, while others are more complex, such as the replacement of filter media.

4. **Conformance to International Agreements and Treaties.** *The project will improve the human health and environmental conditions on both sides of the border. The rehabilitation of the WWTP and the expansion of the wastewater collection system will improve water quality in the Tecate River, which flows into the United States. Construction of the proposed works will take place exclusively in Mexico and will have no impact in the United States. The project complies with international agreements related to water and the environment.*

II. Human Health & Environment

1. **Human Health and Environmental Needs.**

The objective of the proposed project is to improve human health and environmental conditions in Tecate through the implementation of projects aimed at improving potable water, sewage, and sanitation systems. These projects will provide service to several areas of the city that currently lack this service, and will improve some components of the existing system, such as the WWTP and the water disinfection systems.

At present, several problems related to human health and the environment are being experienced, which will be addressed through project implementation. Approximately 92% of the population has access to piped water, while the remaining 8% meets its supply needs by means of water trucks. Water is oftentimes stored by users in inappropriate containers, thus increasing the risk for gastro-intestinal diseases.

Furthermore, only 84% of the population has access to the wastewater collection system, resulting in an increased risk for human contact with untreated wastewater, and for contamination of surface and ground water. Additionally, the WWTP does not comply with the maximum allowable discharge limits, affecting the water quality of the Tecate River, and potentially of the alluvial aquifer.

Project implementation will expand coverage of potable water and sewage services to practically 100% of the population and will rehabilitate the WWTP. The proposed projects will address the current situation in the following manner: (1) human health conditions of residents who obtain their water supply by means of water trucks, and use inappropriate storage methods, will be improved; (2) human health conditions will be improved by reducing or eliminating wastewater surface flows caused by the lack of wastewater collection lines; (3) water quality of the Tecate River will improve by rehabilitating the WWTP and through construction of new wastewater collection lines; (4) there will be a reduction in the potential for soil and aquifer contamination resulting from the use of latrines and septic tanks in areas lacking this service, as well as by the use of lines in poor condition and discharges from the WWTP into the Tecate River riverbed.

2. Environmental Evaluation.

Mexican environmental regulations require preparation of an Environmental Impact Statement (EIS). Two EIS were developed, one for potable water projects and one for wastewater projects. Both documents were submitted to the Dirección General de Ecología, and were approved on November 26, 1999.

The resolution issued by the Dirección de Ecología identified mitigation measures that must be undertaken during the construction phases of the proposed projects. The mitigation measures are mainly related to dust control, the use of explosives, and the removal of construction by-products.

Funding by the Border Environmental Infrastructure Fund (BEIF) requires compliance with regulations established by the U.S. National Environmental Policy Act (NEPA). To this end, BECC prepared an Environmental Assessment (EA) that complements the EIS, and provides detailed information regarding potential transbounday impacts. It must be noted, that only positive impacts in the United States were identified. These benefits relate to improvements to the water quality of the Tecate River.

The first draft of the EA was submitted by the BECC to EPA on December 17, 1999; this information has been reviewed and complemented during the month of January. Additionally, a biological survey was conducted during April to identify any potential impacts to listed sensitive species. The results of this study were submitted to EPA.

Based on the information submitted to EPA, it is expected that EPA will issue a Finding of No Significant Impact (FONSI) in mid-May. This document shall be made available for a 30-day public comment period. It is expected that EPA will adopt the FONSI in early June, 2000.

3. Compliance with Applicable Environmental and Cultural Resource Laws

As stated earlier, the Environmental Impact Statement (EIS) was submitted to the Dirección General de Ecología for review and approval. Also, continuous efforts have been carried out with EPA to ensure issuance of the FONSI.

III. Technical Feasibility

1. **Appropriate Technology**.

The technology being proposed for this infrastructure projects is appropriate for Tecate's physical and socio-economic conditions. The use of PVC piping for construction of the potable water distributions and wastewater collection systems is a standard engineering practice. PVC pipe types for each application have been clearly established. Thus the use of PVC type C-900 is proposed for the water distribution lines, and the "sanitary" type for the sewerage lines.

The technology proposed for rehabilitation of the wastewater treatment plant will be the same as the one currently being used at the plant. Startup, operation, and maintenance will be less complex than those expected by the use other technologies. Additionally, the proposed improvements will address problems experienced in the current plant operations, related to sludge management, as described previously. The trickling filters are used in several other cities throughout Mexico and the world. The effectiveness of this technology and their relatively simple operation, are well established.

To ensure that the proposed technology is the most appropriate for Tecate's physical and socio-economic conditions, several alternatives were reviewed. Evaluation of the water and sewage distribution lines considered alternative locations, materials, and sizes. Pipe-laying will follow standard engineering practices, facilitating the selection process of alternatives.

For the case of the WWTP, several alternatives were considered for each of the unit processes. Evaluation of the alternatives was simplified by the fact that a plant with sufficient capacity already exists. Therefore, consideration was not given to expanding it or constructing a new plant at a different location.

The no-action alternative was also considered. However this alternative was deemed inappropriate since it would maintain or aggravate the problems described above.

2. **Operation and Maintenance Plan**

Operation and maintenance of the proposed infrastructure does not represent an additional burden for the utility. The proposed technology is the same as the one currently used, and CESPTe personnel have the required experience.

Rehabilitation of the WWTP will facilitate operations because it includes a mechanized means for cleaning the screen and higher quality sludge will be produced that will be easier to handle.

3. **Compliance with Applicable Design Regulations and Standards**

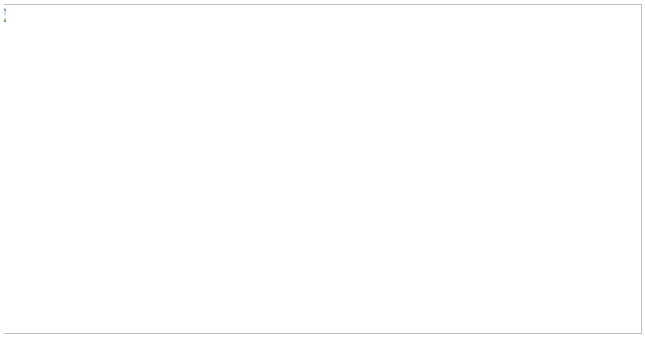
All 54 project components have preliminary design (anteproyectos), which have been submitted to C.N.A. for review and approval. Also, to date, final design has been developed for the 1999 and 2000 projects. Final design for 2001 projects is currently being developed by CESPTe.

IV. Financial Feasibility and Project Management

1. Financial Feasibility.

NADB carried out an analysis to determine the project's financial feasibility. The analysis determined the amount of grants and loans that CESPTe could receive from the Bank and what impact the proposed project would have on rates under various grant and loan combinations. The results of the analysis were presented to the community during the second public

participation meeting on January 28, 2000. The following table describes the construction costs of the proposed projects.



As stated earlier, the 1999 projects have already been constructed with state and federal funding. Though certification for these works is not being considered, invested amounts will be considered as part of the Mexican match towards the total cost of the project. The following table provides a summary of the financial structure recommended by NADB.

Available Funding	Amount (MX$)	% of Total
Capital		
CESPTe Contribution	*472,739*	*0.64*
Sub-total Capital	*472,739*	*0.64*
Loan		
NADB Loan	*5,949,222*	*8.01*
Sub-total Loan	*5,949,222*	*8.01*
Grants		
C.N.A.	*16,951,722*	*22.48*
State Government	*16,951,722*	*22.48*
BEIF	*33,903,444*	*45.67*
Sub-total Grants	*67,806,888*	*91.35*
TOTAL	74,228,850	100.00

2. Rate Model.

As part of its financial analysis, NADB developed a rate model that was used to determine what impacts the proposed project would have on the rates under various loan/grant scenarios (both for construction as well as for transition).

The rate study recommends annual adjustments to the rates based on inflation plus 1 per cent. In other words, "real" increases of 1% per year is recommended.

2. Project Management.

The project will be managed by CESPTe, who has managed the operation of the treatment plant, and the wastewater collection and water distribution systems for several years.

V. Community Participation

1. Comprehensive Community Participation Plan

The Community Participation Plan, submitted by the project applicant on April 28, 1999, was developed in conjunction with the Steering Committee. The main purpose of the plan was to inform the Tecate community on the benefits and costs and impacts of the water and sanitation project, as well as to obtain approval of the majority of the community through extensive outreach conducted in various sectors and subdivisions of the city.

An extensive and long-term media campaign was undertaken. Among the more salient outreach actions undertaken were: development of a slogan; development of three brochures; creation of an introductory video-clip; preparation of a Power Point presentation; media plan involving production and broadcasting of 558 radio spots; 12 articles in three newspapers; 140 broadcasting hours; placement of plastic signs with message; production and distribution of 5,000 flyers; production and distribution of 2,000 stickers.

2. Local Steering Committee

The Citizen's Committee for the water and sanitation project was created on February 16, 1999. Originally it had twelve members and a Board made up as follows:

Chairman *Luis Ernesto Rivera Macías*
Secretary *Arturo José Martínez Leal*
Technical Secretary *Ing. Patricia Ramírez Pineda*

The Committee was expanded later, after CESPTe issued a public notice in three main newspapers, radio stations, and through invitations sent to the NGO's, professional associations, chambers, and organizations.

On March 10, 1999, Josefina Guerrero, BECC Mexican Advisory Council Member, provided training regarding public processes, and opinion surveys.

The Citizen's Committee undertook the main responsibility of supporting the definition of the community participation plan and also provided follow up, informing the community on the water and sanitation project, and defining information and outreach strategies.

3. Local Organizations

Various NGO's, professional associations, and chambers were contacted, who announced the formation of the citizen's committee and distributed project information.

4. Public Information

As stated earlier, project information was distributed to the community with three brochures, a video clip, a Power Point presentation, 8 radio spots, 2 articles in three newspapers, 140 broadcasting hours, message signs, 5,000 flyers, and 2,000 stickers. Additionally, several public meetings were held, as described below.

5. Public Meetings

An extensive program of public meeting was carried out, consisting mainly of:

- *Over 70 public meetings by colonia, which 3,000 persons attended*

- *A general public meeting, with a 30-day notice, on June 1, 1999, and with 340 persons in attendance*
- *A 2nd public meeting was held on January 28, 2000, and 316 people attended.*

During the public meetings held in each sector, and during the first general public meeting, the general technical aspects of the project were presented, including its scope, location, expected benefits, estimated costs, etc. Also, during the second public meeting the final version of the cost estimates, and the proposed financial structure for the project were presented.

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VI. Sustainable Development

1. Definition and Principles

Sustainable development is defined as social and economic development based on the conservation and protection of the environment, and on the rational use of natural resources, but at the same time considering both present and future needs and impacts. This is the definition given by the Border XXI program developed by Mexico and the United States.

Principle No. 1 *states that the human being needs to be at the center of all sustainable development considerations, and has a right for a healthy and productive life in harmony with nature. This principle will be met by the project through the reduction of diseases that are directly related to water use and consumption and wastewater collection and treatment.*

Principle No. 2 *indicates that humans have the right to develop while satisfying present and future needs for development and environmental quality. The project will meet this principle by ensuring improved sanitation conditions for the present and future population, guaranteeing environmental protection.*

Principle No. 3 *states that environmental protection must be an integral part of the development process. This principle will be met by improving the quality of the discharge to the Tecate River and by reducing the potential for groundwater contamination.*

Principle No. 4 *indicates that the project stakeholders must participate in any activity related with the sanitation project. This principle will be met through the implementation of the public participation process.*

b. Institutional and Human Capacity Building

The proposed project will strengthen the institutional capacity of CESPTe in the following way:

- *The capacity to provide service will be increased by the expansion of the system*
- *The volume of unaccounted-for water will be reduced by replacing lines in meters in poor condition*

c. Conformance with Applicable Local and Regional Conservation and Development Plan

The project complies with the guidelines provided by the following federal, state, and municipal plans:

Programa de Agua Potable, Alcantarillado y Saneamiento *This program was established by the Federal Government in 1990. The plan's objective is to meet the demand of areas lacking service, as well as the demand exerted by growth. Furthermore, the plan intents to develop federal, state, and municipal capacity to promote environmental protection, thus reducing contamination arising from wastewater. An additional objective is the consolidation of the utilities to achieve their autonomy and to increase efficiency.*

Programa de Agua Potable y Alcantarillado en Zonas Urbanas (APAZU) *This program is one of the financial sources for the construction of projects proposed in the Plan Maestro para la Consolidación y Desarrollo Institucional del Organismo Operador.*

Subcomité de Agua Potable y Alcantarillado COPLADE *This committee coordinates the scheduling and budgeting for municipal activities based on water and sanitation needs.*

Programa Integral Ambiental de la Frontera Norte (PIAF) *this program is based on the guidelines established by the* **Plan Nacional de Desarrollo***, especially as it relates to sanitation on the border area.*

Programa de Desarrollo Urbano de Centro de Población de la Ciudad de Tecate, BC del Municipio de Tecate *This plan is part of the Plan Estatal de Desarrollo, and has as an objective promoting an orderly urban development, and enhancing and preserving the environment to create favorable conditions in terms of housing and public services for the population.*

d. Natural Resource Conservation

The improvement of the water and wastewater infrastructure will reduce water consumption and groundwater extraction through the installation of meters and the reduction in water losses in the distribution system.

Improvements to the wastewater collection system will reduce the potential for groundwater contamination through aquifer recharge. Additionally, the quality of the Tecate River will be improved by eliminating fugitive flows arising from areas that lack service.

The adequate operation of the WWTP will benefit the community and the ecosystem, particularly by improving the quality of the discharge, thus improving human health and environmental conditions in the riparian habitat.

e. Community Development

The coverage of the water system in Tecate is currently 92% of the population. The remaining 8% of the population obtains water from water trucks. Similarly, the coverage of the wastewater collection system is 84% of the population. Residents without access to the sewer system dispose of their wastewater by means of latrines and open ditches.

The proposed project will allow for the provision of water and sewer service to 100% of the population. This benefit will translate into an improved quality of living.

List of Available Documents

Step II Document
Master Plan
Environmental Impact Analysis
Environmental Assessment
Biological Survey Report
Conceptual Design
Industrial Pretreatment Program
Backup Financial Information
Public Participation Report