Transboundary Environmental Assessment (EA) for Playas de Rosarito Wastewater Collection Improvement Projects

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Prepared for:

Comisión Estatal de Servicios Públicos de Tijuana

Border Environment Cooperation Commission

U.S Environmental Protection Agency Region 9

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1.1 Introduction

The United States Environmental Protection Agency (EPA) administers funds for water and wastewater infrastructure projects within 100 kilometers (km) of the international boundary between the United States (US) and Mexico. EPA policy for use of border infrastructure funds requires the evaluation and certification of projects by the Border Environment Cooperation Commission (BECC) prior to grant award. As part of the BECC certification process, the proposed project must comply with both EPA National Environmental Policy Act (NEPA) regulations as well as Mexico Environmental regulations. The proposed federal action under consideration for funding is the expansion of the public wastewater collection system in the City of Rosarito, State of Baja California, Mexico.

EPA has determined that it will follow the NEPA and EPA regulations for environmental impacts in the US from projects located in the US or Mexico. This Environmental Assessment (EA) was prepared using Council of Environmental Quality (CEQ) regulations 40 CFR Parts 1500-1508 and EPA regulations (40 CFR Part 6) as guidance. This EA documents the environmental consequences in the US of the proposed federal action.

EPA follows the US Agency for International Development (AID) approach as summarized in Title 22 CFR Part 216.1-216.10 as guidance for assessing environmental impacts in Mexico. The AID regulations envision collaboration with affected countries to the maximum extent possible in developing an EA. AID regulations authorize use of either a study prepared by an international body in which the US is a participant, or a concise review of the relevant environmental issues, with appropriate documentation, as a substitute for an EA. A separate *Manifestación de Impacto Ambiental* (MIA) document prepared for this project evaluates the environmental impacts of the proposed federal action in Mexico.

1.2 Purpose of Environmental Assessment

The Comisión Estatal de Servicios Públicos de Tijuana (CESPT) is developing an infrastructure project to extend wastewater collection services within the City of Rosarito. Presently in the areas proposed for service, there is no existing wastewater collection system. The only wastewater disposal facilities that exist are on-site disposal units, consisting primarily of latrines, cesspools and open ditches. These on-site facilities do not provide adequate wastewater treatment and disposal and thus pose a threat to public health and the environment.

CESPT intends to seek certification from BECC for this wastewater expansion project in order to become eligible for funding from EPA's Border Environment Infrastructure Fund (BEIF), which is administered by the North American Development Bank (NADB). EPA intends to authorize the use of BEIF for CESPT to

implement the expansion of the wastewater collection systems to the identified areas of Rosarito that currently lack this service. EPA requires all projects requesting BEIF funding to comply with NEPA.

The project is being developed in coordination with the BECC. The description of the affected environment and potential impacts in the transboundary EA will be limited to those environmental resources and services that would be affected in the US by the alternatives.

Therefore, this transboundary EA evaluates current conditions and assesses the direct, indirect and cumulative impacts of the construction and operation of the proposed action in Rosarito, Baja California, Mexico, on the environment of the US. Potential adverse and beneficial transboundary environmental impacts of two action alternatives, as well as the "no action" alternative are described in this document. The main objective of this document is to describe transboundary impacts (i.e., impacts in the US) associated with the alternatives evaluated, although reference is also made to potential impacts in Mexico to the extent that they may influence effects in the US. This document analyzes potential environmental effects of the proposed action on the US to ensure that there are no significant adverse impacts prior to issuance of a final commitment for financing by EPA.

This EA is extensively based on information contained in the Potable Water and Wastewater Master Plan for Tijuana and Playas de Rosarito (CDM 2003); the Environmental Assessment for the Potable Water and Wastewater Master Plan for Tijuana and Playas de Rosarito (CDM 2003), and; the *Manifestación de Impacto Ambiental* (CDM 2003) prepared for the Master Plan to comply with environmental review requirements of the Baja California State Ecology Department. CESPT provided the project alternatives, which are described in Section 2, including pipeline alignments and diameters, and population and flow estimates.

The decision to be made is whether to implement the no action alternative or one of two action alternatives for the expansion of the wastewater collection systems. This EA is being prepared to determine if a Finding of No Significant Impact (FNSI) can be issued for the proposed action. A FNSI precludes the need to perform an Environmental Impact Statement (EIS), while a finding of potentially significant impact during development of an EA dictates that an EIS is required.

1.3 Project Location and Study Area

CESPT is responsible for providing water and sanitation service to the municipalities of Playas de Rosarito, which in the year 2000 had a population of approximately 63,000 (CDM 2003). In 2005, the population in Playas de Rosarito was 73,305 (INEGI Conteo 2005) and is projected to increase to 231,577 in 2030 (CDM 2003).

The municipality of Playas de Rosarito is immediately south of the city of Tijuana, but may be considered part of the larger metropolitan area. The municipality of Tijuana is adjacent to the City of San Diego, California on the US-Mexico border.

The study area for this EA is defined as the areas in the United States adjacent to the border that may be affected by the proposed projects in Rosarito. Section 3 describes the existing environmental resources in the study area. The study area or the area that could be affected by implementing the proposed action was defined by the BECC to be limited to an area within a 6.2-mile (10 km) radius north of the US-Mexican border. Figure 1-1 shows the area of interest where potential project effects are evaluated. The proposed action would occur within Rosarito. Figure 2-1 shows the detailed locations of the communities proposed for wastewater collection service in relation to the coastal US. For this EA, only the US coastal areas within the 6-mile radius that may be affected by Rosarito discharges into the Pacific Ocean are considered.

1.4 Purpose and Need for Proposed Action

The purpose of the proposed action is to address the environmental and public health risks associated with inadequate collection, treatment, and disposal of wastewater. The proposed action will protect public health by providing appropriate wastewater collection to 20,851 residents that currently lack access to this service. Residents in these communities currently use latrines or open ditches for wastewater disposal. The proposed action will significantly reduce or eliminate inappropriate wastewater disposal by providing collection and conveying flows to existing wastewater treatment plants, resulting in improved environmental and sanitation conditions.

The proposed action consists of extending the wastewater collection systems to existing communities within the municipality of Playas de Rosarito that currently lack access to these services. The project will serve approximately 20,851 residents by installing about 57,000 meters (38 miles) of wastewater collection (sewer) lines ranging from 20 to 38 centimeters (8 to 14 inches) in diameter. All wastewater collected by the new sewer systems will be treated at the existing Rosarito and Rosarito Norte wastewater treatment plants (WWTPs). Table 1-1 summarizes the proposed actions. Section 2 provides more detail about the proposed action and other alternatives.

Table 1-1
Summary of Proposed Action for Wastewater Services in Rosarito

Unserved Community	Population Served	Wastewater Generated (L/s) (MGD)	Service Details
Poblado Morelos	2,320	4.7 (0.1)	13,450 m sewer pipeline connected to Rosarito WWTP
Colinas de Rosarito I y II	3,316	23.3 (0.15)	9,502 m sewer pipeline connected to Rosarito WWTP
Fraccionamiento La Mina	6,555	13.4 (0.31)	13,347 m sewer pipeline connected to Rosarito Norte WWTP
Saint Lucia	2,513	5.1 (0.11)	5,671 m sewer pipeline connected to Rosarito Norte WWTP
Colinas de Montecarlo	4,581	9.3 (0.21)	9,741 m sewer pipeline connected to Rosarito Norte WWTP
Campestre Lagos	1,566	4.9 (0.07)	5,171 m sewer pipeline connected to Rosarito Norte WWTP

Source: CESPT 2006

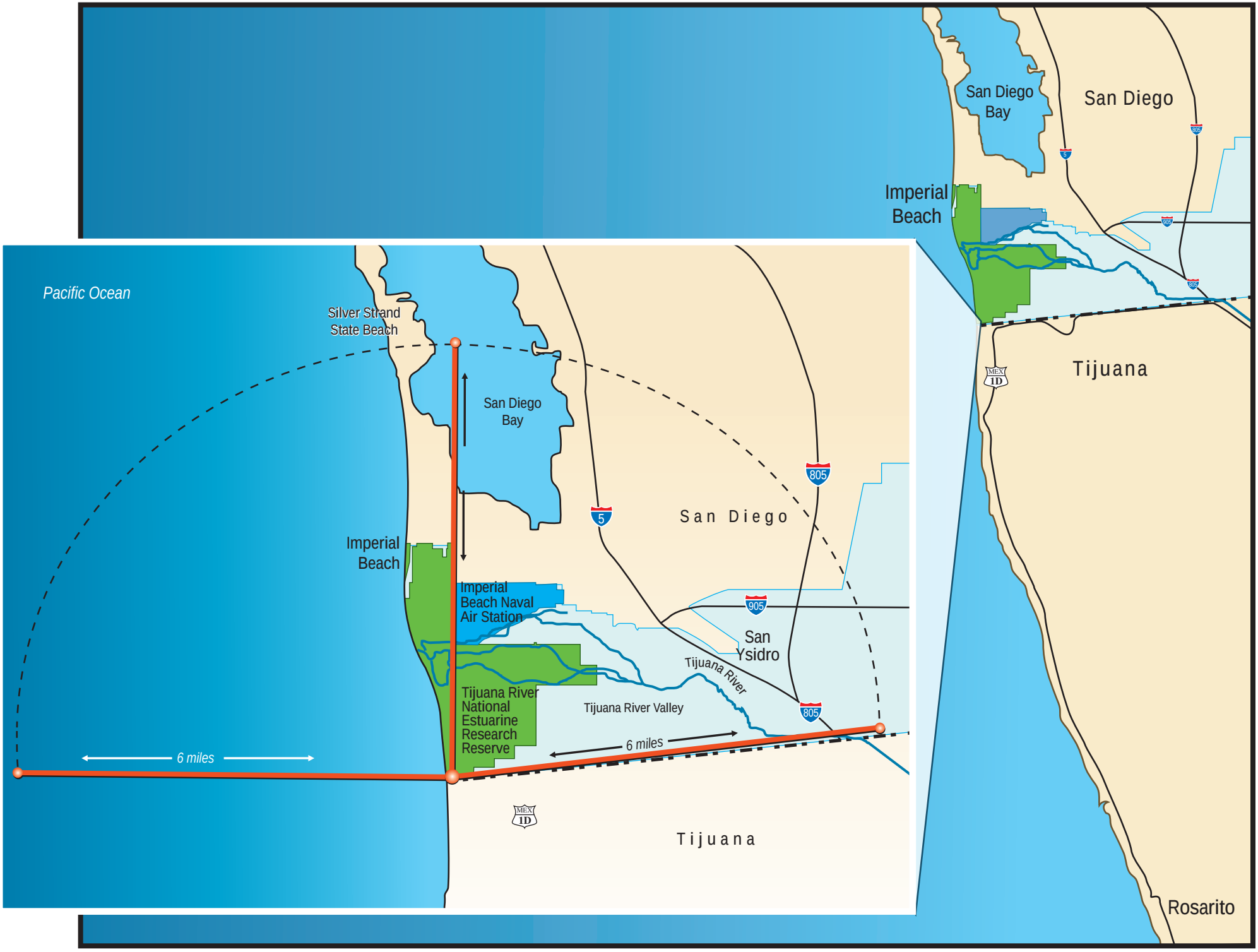

Figure 1-1 Area of Interest

1.5 Scope of Environmental Assessment

The purpose of this EA is to document and make public the potential transboundary environmental impacts that may arise from the implementation of the Proposed Action, the no action, or any other of the action alternatives considered by CESPT to expand the coverage of the wastewater collection systems.

This EA was prepared following the scope of work presented under BECC's "BEIF Environmental Assessment Guidelines" for Mexican environmental infrastructure projects for which BEIF funding is sought. The organization of this document follows that established by the BECC scope of work.

The following general topics are included in the scope of this EA:

- Description of Alternatives
- Environmental Setting
- Transboundary Impacts Analysis
- Cumulative Impacts Analysis

1.6 Relevant Environmental Resources

The scope of this EA is limited to the environmental resources and services within the study area in the United States that may be affected by the no action alternative or one of the action alternatives. A range of environmental resources and services was initially considered for potential affect by the "no action" and action alternatives. Environmental resources and services are identified as relevant or not relevant based on the possibility of any of the alternatives affecting that particular resource or service.

Environmental resources and services determined to be "not relevant" to the project were eliminated from detailed study and are not discussed beyond this section. Environmental resources and services relevant to the alternatives evaluation, including the Proposed Action, are discussed in greater detail in Sections 3 and 4.

The following environmental resources and services were initially considered for potential affect by the "no action" and action alternatives:

- Historic and Cultural Resources
- Geology
- Hazardous Waste
- Solid Waste
- Land Use
- Floodplains
- Wetlands
- Coastal Resources
- National Landmarks
- Wild and Scenic Rivers

- Air Resources
- Noise
- Water Resources/Quality
- Groundwater
- Biological Resources
- Socioeconomics
- Environmental Justice
- Public Health
- Municipal Services

Rosarito is about 30 km (18 miles) south of the US-Mexico international border. Many environmental resources, including groundwater and floodplains, in the US would not be affected because of Rosarito's considerable distance south of the border. Municipal services in Mexico would be improved by increasing the collection coverage and the wastewater system, but municipal services in the US would not be affected by any of the alternatives.

Many resources would not be affected because all construction activities for the project would occur in Mexico. National landmarks and wild and scenic rivers in the US would not be directly affected because there is no construction in the US. Potential indirect effects also would not occur because of Rosarito's distance to the US sites.

Any hazardous or solid waste existing, produced or found during project construction would not affect the study area in the US because all waste would remain, be handled, and disposed of in Mexico, according to applicable Mexican regulations. There would be no direct or indirect effects to US landfills or hazardous waste sites from the project. Land use in Mexico may be affected if construction activities took place within areas not previously disturbed or currently in use, however much of the construction activity would take place on previously disturbed land. The project would not affect land use in the US because the proposed project does not include construction in the US.

Construction activities that generate noise, dust and other air quality emissions would not affect the US because of the distance of the construction sites to the US. Additionally, construction in Mexico would not affect historic and cultural resources and geology in the US because of the distance to the US-Mexico border.

The alternatives could affect surface water quality by changing wastewater discharges to the Pacific Ocean. Changes in coastal water quality could indirectly affect biological and coastal resources in the US. Terrestrial biological resources would not be affected because of the distance of Rosarito to the US. If water quality along US beaches changes, the public health of swimmers and beach-goers could be affected. Additionally, if beaches are closed for public health reasons, recreation and tourism industries could be affected. The project would improve public health in Mexico, and because of frequent border crossings, this could reduce potential health threats to the US. The US border region shares close economic ties with the Tijuana and Playas de Rosarito region. This border economy could improve if the proposed action is

implemented. If public health risks in Rosarito are reduced, more US residents might visit the area, improving the border economy. Environmental justice in the US would not be an issue because construction activities that could affect low income and minority populations would not occur within the US.

In summary, hazardous and solid waste, land use, national landmarks, wild and scenic rivers, and municipal services in the study area would not be directly or indirectly affected by the alternatives and therefore are not relevant for further detailed evaluation. Cultural resources, geology, groundwater, floodplains, and environmental justice are covered in the impacts evaluation to further assess potential indirect effects. Surface water resources and quality, biological resources, wetlands, coastal resources, socioeconomics, and public health may be relevant environmental resources and services linked to the alternatives evaluation, and are assessed in greater detail in this EA. Also, potential indirect effects of construction activities on air quality and noise in the US are analyzed in this EA.

1.7 Regulatory Drivers and Guidance

The US and Mexico have regulations to protect the environment and improve environmental quality. The following sections discuss international and US laws and regulations as they apply to the proposed project.

1.7.1 International Agreements

The BECC BEIF Environmental Assessment Guidelines identify and describe major bilateral agreements between Mexico and the US related to environmental protection. The agreements that apply to the proposed action include:

- 1889 International Boundary Convention
- 1944 Water Treaty
- 1983 La Paz Agreement (or Border Environmental Agreement)
- 1992 Integrated Border Environmental Plan (IBEP)
- 1994 North American Free Trade Agreement (NAFTA)

The 1889 International Boundary Convention established the International Boundary Commission (IBC). The Water Treaty of 1944 replaced the IBC with the International Boundary and Water Commission (IBWC) and granted the US Section of the IBWC authority to address water quality, conservation, and use issues within the US.

The IBWC was created by the governments of the US and Mexico to apply the provisions of various border and water treaties and settle differences arising from such applications through a joint international commission. All international border and water treaties with respect to Mexico are coordinated through the IBWC. IBWC coordinates the exchange of information between the US and Mexico for all program

activities that involve watersheds or aquifers crossing into Mexico. The IBWC jurisdiction extends along the US-Mexico International Border, and inland into both countries where international border and water projects may exist. The IBWC has coordinated the establishment of cooperative relationships with federal, state, and local agencies, both in the US and Mexico, in carrying out its border projects and activities.

The "Agreement for the Protection and Improvement of the Environment in the Border Area," known as La Paz Agreement, was signed in 1983. The main objective of the Agreement is to protect, improve, and conserve the environment of the border area. The La Paz Agreement defines the border region as the area lying 100 km (62 miles) to the north and south of the US-Mexico International Border. In 1992, the Integrated Border Environmental Plan (IBEP) was released, and building on this, the Border XXI Program increased the scope of concern to include environmental health and natural resources issues.

As part of NAFTA, the US and Mexico signed a bilateral agreement to address the deficiencies in water and wastewater infrastructure in the border area. A second environmental agreement negotiated to augment NAFTA is the 1994 US-Mexico Agreement Concerning the Establishment of a BECC and NADB. The BECC-NADB Agreement targets certain environmental problems in the border region to remedy international border environmental or health problems. The NADB and EPA created the BEIF to make environmental infrastructure projects affordable for communities throughout the US-Mexico border region by combining grant funds with loans or guaranties for projects that would otherwise be financially unfeasible.

1.7.2 US National Environmental Policy Act of 1969 (as amended)

NEPA was passed in 1969 "to assure that all branches of government give proper consideration to the environment prior to undertaking any major federal action that significantly affects the environment." NEPA requires all federal agencies to prepare Environmental Information Documents (EIDs), Environmental Assessments (EAs) and/or Environmental Impact Statements (EISs) to assess environmental impacts from project alternatives.

The purpose of NEPA is "to declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality." Sec. 2 [42 USC § 4321].

According to NEPA, it is the continuing responsibility of the federal government to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate federal plans, functions, programs, and resources.

NEPA, as amended in 1970, requires federal agencies to: (a) utilize a systematic, interdisciplinary approach which will ensure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision making which may have an impact on man's environment; (b) identify and develop methods and procedures, in consultation with the Council on Environmental Quality established by Title II of this Act, which will ensure that presently un-quantified environmental amenities and values may be given appropriate consideration in decision-making along with economic and technical considerations; and (c) include in every recommendation: a detailed statement on the environmental impact of the proposed action; any adverse environmental effects which cannot be avoided should the proposal be implemented; alternatives to the proposed action; the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and; any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented Sec. 102 [42 USC § 4332].

1.7.3 US Air Regulations

The Clean Air Act (CAA) was enacted in 1970 to address air pollution at the federal level. The CAA requires the EPA administration to set national ambient air quality standards and emission standards. Furthermore, the act established auto emission standards. Prior to the passage of the CAA, regulations for air quality control were defined and enforced at the state level. The CAA may allow states to have more stringent standards than those required by the federal government.

The CAA was amended in 1977. The amendment relaxed auto emission standards and established provisions for the deterioration of areas. The CAA was further amended in 1990. The 1990 Clean Air Act provides for interstate commissions on air pollution control, which are to develop regional strategies for cleaning up air pollution. The 1990 Clean Air Act includes other provisions to reduce interstate air pollution. The CAA also acknowledges that air pollution moves across national borders, and the law addresses pollution that originates in the US and reaches Canada and Mexico.

The 1990 CAA Amendment also created the framework for the creation of a permit program for large point sources of air contaminants.

The CAA requires federal actions to conform to any state implementation plan approved or promulgated under Section 110 of the Act. For EPA actions, the applicable conformity requirements specified in 40 CFR Part 51, Subpart W; 40 CFR Part 93, Subpart B; and the applicable state implementation plan must be met. Under the Federal Rule on General Conformity, 40 CFR Part 93, a conformity determination is required only when emissions occur in a non-attainment area. Much of the work necessary to carry out the Clean Air Act is delegated to the states.

1.7.4 Mexican Air Regulations

Two air quality regulations and two noise regulations relevant to this EA have been incorporated into the *Normas Oficiales Mexicanas,* or Mexican Official Regulations:

- *Límites Máximos Permisibles de Emisiones para Vehículos con Gasolina,* or Maximum Permissible Emission Limits for Vehicles Using Gasoline (NOM-041-SEMARNAT-1999)

- *Límites Máximos Permisibles de Emisiones para Vehículos con Diesel,* or Maximum Permissible Emission Limits for Vehicles Using Diesel (NOM-045-SEMARNAT-1996)

- *Límites Máximos Permisibles de Emisión de Ruido de Vehículos Automotores,* or Maximum Permissible Emission Limits for Noise from Motor Vehicles (NOM-080-SEMARNAT-1994)

- *Emisiones de Ruido de Fuentes Fijas,* or Noise Emissions from Point Sources (NOM-081-SEMARNAT-1994)

1.7.5 US Water Quality Regulations

The Clean Water Act (CWA) established the basic structure for regulating discharges of pollutants into the waters of the US. It gives EPA the authority to implement pollution control programs such as setting wastewater standards for industry. The CWA also contains requirements to set water quality standards for contaminants of concern in surface waters. The Act makes it unlawful for any person to discharge a pollutant from a point source into navigable waters, unless a permit is obtained under its provisions. It has funded the construction of sewage treatment plants under the construction grants program and recognized the need for planning to address the critical problems posed by non-point source pollution.

1.7.6 Mexican Water Quality Regulations

There are five water quality regulations relevant to this EA in the *Normas Oficiales Mexicanas,* or Mexican Official Regulations:

- *Limites Máximos Permisibles de Contaminantes en las Descargas de Aguas Residuales en Aguas y Bienes Nacionales,* or Maximum Permissible Limits of Contaminants in Wastewater Discharges into National Waters and Natural Resources (NOM-001-SEMARNAT-1996)

- *Límites Máximos Permisibles de Contaminantes Para las Aguas Residuales Tratadas que se Reusen en Servicios al Público,* or Maximum Permissible Limits of Contaminants for Treated Wastewaters that are Reused in Services to the Public (NOM-003-SEMARNAT-1997)

- *Límites Permisibles de Calidad y Tratamiento a que Debe Someterse el Agua Para su Potabilización,* or Permissible Quality and Treatment Limits for Potable Water (NOM-127-SSA1-1994)

- *Vigilancia y Evaluación del Control de Calidad del Agua Para Uso y Consumo Humano Distribuida por Sistemas de Abastecimiento Público,* or Monitoring and Evaluation of Quality Control of Water for Human Use and Consumption through Public Supply Systems (NOM-179-SSA1-1998)

- *Requisitos Sanitarios que Deben Cumplir los Sistemas de Abastecimiento de Agua para Uso y Consumo Humano Públicos y Privados,* or Sanitary Requirements to Which Public and Private Water Supply Systems for Human Use and Consumption Must Comply (NOM-012-SSA1-1993)

1.7.7 US Biological Resource Regulations

The Endangered Species Act (ESA), 16 USC 1536 *et seq*., protects threatened and endangered plants and animals and their habitats. The US Fish and Wildlife Service (USFWS) of the Department of the Interior implements the ESA at a national level. California Department of Fish and Game (DFG) implements the California ESA. DFG maintains a list of special status species within the state. The border region of San Diego County is home to 97 special status species.

Species include birds, insects, fish, reptiles, mammals, crustaceans, flowers, grasses, and trees. Anyone can petition USFWS to include a species on this list. The law prohibits any action, administrative or real, that results in a "taking" of a listed species, or adversely affects habitat. Likewise, import, export, interstate, and foreign commerce of listed species are all prohibited.

In the context of this study, the ESA must be observed for any potential impacts to terrestrial habitat in the US resulting from construction activities, as well as impacts to aquatic habitat resulting from changes in water quality in the Pacific Ocean.

1.7.8 Mexican Biological Resource Regulations

The *Norma Oficial Mexicana,* or Mexican Official Regulation having to do with protection of species is NOM-059-SEMARNAT-2001. The regulation includes a list of native Mexican species, and their status as either endangered, threatened, afforded special protection, or likely to be extinct. Of the 569 amphibians, birds, fungi, invertebrates, mammals, fish, plants, and reptiles listed, 104 are endangered, 164 are threatened, 10 are considered probably extinct, and the rest are afforded special protection.

1.7.9 Federal Cross-Cutting Laws and Regulations

This EA addresses the following laws within its scope as well.

National Natural Landmarks - The Secretary of the Interior is authorized to designate areas as National Natural Landmarks for listing on the National Registry of Natural

Landmarks pursuant to the Historic Act of 1935, 16 US Code (USC) 461 et seq. In conducting the environmental review of the Proposed Action, EPA is required to consider the existence and location of natural landmarks, using information provided by the National Park Service (NPS) pursuant to 36 CFR 62.6(d). The Tijuana River Estuary is a National Natural Landmark.

Cultural Resources Data - The *Archeological and Historic Preservation Act* (AHPA) of 1974, 16 USC 469 *et seq*. provides for the preservation of cultural resources if an EPA activity may cause irreparable loss or destruction of significant scientific, prehistoric, or archeological data. In accordance with the AHPA, the responsible official or the Secretary of the Interior is authorized to undertake data recovery and preservation activities.

Cultural Resources - The *National Historic Preservation Act* (NHPA), as amended, 16 USC. 470, directs federal agencies to integrate historic preservation into all activities which either directly or indirectly involve land use decisions. The NHPA is administered by the NPS, the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers (SHPOs), and each federal agency. Implementing regulations include 36 CFR Part 800: *Regulations of the Advisory Council on Historic Preservation Governing the NHPA Section 106 Review Process*. Section 106 of the NHPA requires federal agencies to take into consideration the impact that an action may have on historic properties which are included on, or are eligible for inclusion on, the National Register of Historic Places. The Section 106 review process is usually carried out as part of a formal consultation with the SHPO, the ACHP, and other parties, such as Indian tribes, that have knowledge of, or a particular interest in, historic resources in the area of the undertaking.

Wetlands Protection - EO 11990, "Protection of Wetlands" of 1977, requires federal agencies conducting certain activities to avoid, to the extent possible, adverse impacts associated with the destruction or loss of wetlands and to avoid support of new construction in wetlands, if a practicable alternative exists. Discharge of dredge or fill material into wetlands and other waters of the US are also regulated under Section 404 of the Clean Water Act.

Floodplain Management - EO 11988, "Floodplain Management" of 1977, requires federal agencies to evaluate the potential effects of actions they may take in a floodplain to avoid, to the extent possible, any adverse effects associated with the direct and indirect development of a floodplain.

Coastal Zone Management Act - The *Coastal Zone Management Act* (CZMA), 16 USC 1451 *et seq*., requires that federal agencies in coastal areas be consistent with approved State Coastal Zone Management Programs, to the maximum extent possible. If an EPA action may affect a coastal zone area, the responsible official is required to assess the impact of the action on the coastal zone.

Fish and Wildlife Protection - The *Fish and Wildlife Coordination Act* (FWCA), 16 USC 661 *et seq*., requires federal agencies involved in actions that will result in the control or structural modification of any natural stream or body of water for any purpose, to take action to protect the fish and wildlife resources that may be affected by the action.

Wilderness Protection - The *Wilderness Act* (WA), 16 USC 1131 *et seq*., establishes a system of National Wilderness Areas. The WA establishes a policy for protecting this system by generally prohibiting motorized equipment, structures, installations, roads, commercial enterprises, aircraft landings, and mechanical transport. Otay Mountain Wilderness, designated in 1999, is the nearest wilderness site to the study area.

Environmental Justice - EO 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," and the accompanying presidential memorandum, advise federal agencies to identify and address, whenever feasible, disproportionately high and adverse human health or environmental effects on minority communities and/or low-income communities.

Section 2
Description of Alternatives

2.1 No Action

The No Action Alternative defines future conditions in the project area if wastewater services are not provided for the affected neighborhoods of Playas de Rosarito; it represents the "future without the project" condition. The No Action Alternative includes wastewater treatment plants and conveyance systems that existed in 2006 or are authorized, funded projects.

Six neighborhoods in Playas de Rosarito do not have adequate wastewater collection and treatment services and rely on latrines or open ditches to meet their wastewater disposal needs. Table 2-1 identifies the six neighborhoods and their population. The population in these neighborhoods could increase in the future, which would generate additional wastewater for disposal. In 2005, population in Playas de Rosarito was 73,305 (INEGI, 2005) and is projected to increase to 231,577 in 2030 (CDM, 2003). Portions of this population growth would occur in areas without wastewater services.

Table 2-1
Population of Unserved Communities

Community	Population Served
Poblado Morelos	2,320
Colinas de Rosarito I y II	3,316
Fraccionamiento La Mina	6,555
Santa Lucia	2,513
Colinas de Montecarlo	4,581
Campestre Lagos	1,566

Under the No Action Alternative, these areas would continue to rely on existing wastewater disposal methods. Part of this untreated discharge would likely reach bodies of water or surface channels, creating potential public health and environmental problems. Population growth without the construction of sewer lines in these areas will aggravate this problem.

Playas de Rosarito has two operating wastewater treatment plants (WWTPs), Rosarito WWTP and Rosarito Norte WWTP, which discharge into the Pacific Ocean. Rosarito WWTP has a current capacity of 60 L/s (1.37 mgd), with plans to upgrade to 120 L/s (2.74 mgd) in 2006. Rosarito Norte WWTP has a capacity of 140 L/s (3.2 mgd), with plans to upgrade to 210 L/s (4.8 mgd) in 2006. These plants provide secondary treatment. The current flows of Rosarito WWTP and Rosarito Norte WWTP, as of 2004, were 49 L/s (1.12 mgd) and 5.8 L/s (0.13 mgd) respectively.

Under the No Action Alternative, these wastewater treatment plants would continue to serve the households currently connected to the existing wastewater collection systems and could accommodate growth within the existing wastewater collection service area. Wastewater collection and treatment would not be provided to the six

communities under consideration since the existing wastewater collection systems would not be extended to these communities under the No Action Alternative.

2.2 Action Alternatives

There are two action alternatives for the proposed action, both consisting of the expansion of the wastewater collection systems to unserved communities. Under the action alternatives, all wastewater generated by the unserved communities would be treated at either the existing Rosarito WWTP or the existing Rosarito Norte WWTP, and ultimately discharged to the Pacific Ocean in Mexico, approximately 30 km (18.8 mi) south of the international border.

The two alternatives are equal in terms of the population served, the wastewater flow generated, the treatment and discharge points, and the diameter and material of the new pipelines. The only difference between the two alternatives is the alignment of pipelines.

Table 2-2 presents a summary of the communities that would be served by the proposed wastewater collection system expansion and by the Rosarito WWTP. Table 2-3 summarizes the communities that would be served by the Rosarito Norte WWTP. The locations of the unserved areas and existing WWTPs are shown in Figure 2-1.

Table 2-2
Unserved Communities that Would be Served by the Rosarito WWTP

Project Name	Population Served	Number of Connections	WW Flows Generated (L/s) (mgd)	Proposed Pipeline Diameter (in) - Length (m)	Status of Conveyance Line to WWTP
Poblado Morelos	2,320	563	4.7 (0.11)	Total – 13,450 m; 8” – 8,150 m; 8”-15” – 5,300 m	Proposed
Colinas de Rosarito I y II	3,316	805	23.3 (0.53)	8”- 9,502 m	Existing

The total wastewater flow generated by the communities proposed for connection to the Rosarito WWTP collection system is 28 L/s (0.64 mgd). The 2004 inflow to the treatment plant was 49 L/s (1.12 mgd), making the total proposed inflow approximately 77 L/s (1.76 mgd). In comparison, the capacity of the Rosarito WWTP was upgraded to 60 L/s in August 2005 and will increase to 120 L/s (2.74 mgd) in 2006. The upgraded plant will have enough capacity to serve the wastewater flows generated by the unserved communities proposed for connection.

Table 2-3
Unserved Communities that Would be Served by the Rosarito Norte WWTP

Project Name	Population Served	Number of Connections	WW Flows Generated (L/s) (mgd)	Proposed Pipeline Diameter (in); Length (m)	Status of Conveyance Line to WWTP
Fraccionamiento La Mina	6,555	1,591	13.4 (0.31)	Total – 13,347 m; 8" – 11,805 m; 12" – 136 m; 15" – 1,406 m	Proposed
Santa Lucia	2,513	610	5.1 (0.12)	8"- 5,671 m	Existing
Colinas de Montecarlo	4,581	1,112	9.3 (0.21)	8"- 9,741 m	Existing
Campestre Lagos	1,566	380	4.9 (0.11)	8"- 5,171 m	Existing

The total wastewater flows generated by the communities proposed for connection to the Rosarito Norte WWTP collection system are 32.7 L/s (0.75 mgd). The 2004 actual inflow to the treatment plant was 5.8 L/s (0.13 mgd), making the total proposed inflow approximately 38.5 L/s (0.88 mgd).

The existing capacity of the Rosarito Norte WWTP is 70 L/s (1.6 mgd). However, the capacity of the plant is being expanded by 140 L/s (3.2 mgd), for total capacity of 210 L/s (4.8 mgd) in 2006. The plant has and will continue to have enough capacity to treat the flows generated by the unserved communities proposed for connection.

As previously mentioned, Alternatives A and B differ only in the routing of flows before connecting to the existing downstream collection systems, which results in a different alignment of some pipelines. Alternative B has been identified as the preferred alternative. Figures describing the location of the Alternative A and Alternative B alignments are presented in Appendix A.

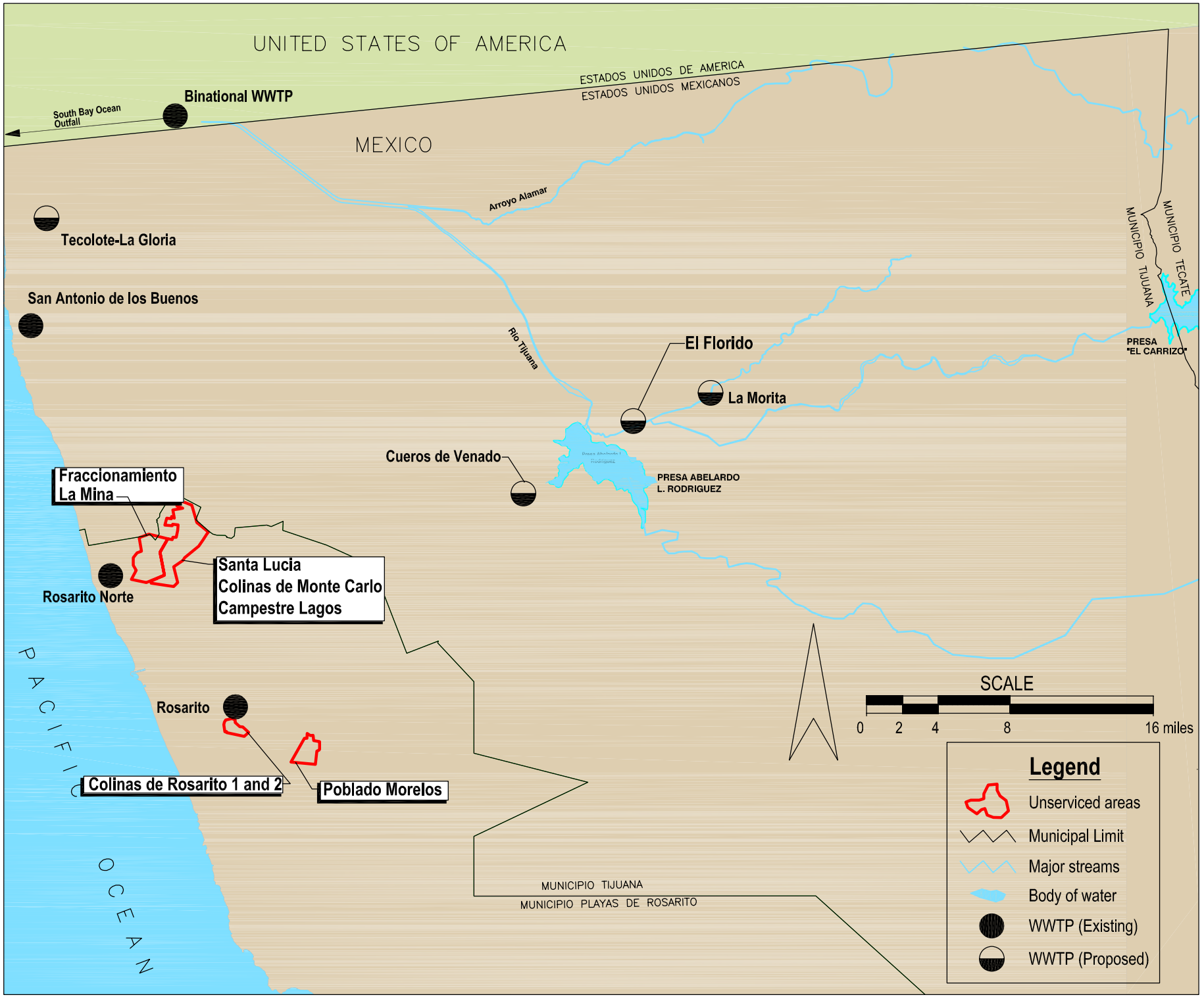

Figure 2-1
Proposed Rosarito Sewer Projects

Section 3
Environmental Setting

The purpose of this section is to describe the environmental resources in the US that could potentially be impacted by the project alternatives described in Section 2. The description of the environmental setting focuses on environmental resources located within the US near the US-Mexico border. However, environmental resources in Mexico are also described in some instances when there exists a direct correlation between resources in both countries (e.g. water resources, socioeconomics). Figure 1-1 depicts the area of interest. BECC defines the study area for the proposed action to be limited to an area within a 6.2-mile (10 km) radius north of the US-Mexican border.

The environmental setting in the vicinity of the border in the US is characterized by a combination of industrial, agriculture, rural and open space land uses. Important features of this area include the Pacific Ocean; the Tijuana River National Estuarine Research Reserve and Imperial Beach Naval Air Station in the City of Imperial Beach; the Tijuana River Valley; the communities of San Ysidro within the City of San Diego; and the western portion of Otay Mesa within the County of San Diego. San Ysidro is the main urban border community in the US within the study area. The western portion of Otay Mesa is only partly developed, mostly with industrial uses, while the eastern portion of Otay Mesa is largely undeveloped. Across the border lie highly urbanized portions of the city of Tijuana that extend fully to the international border.

Topographic features include the relatively flat alluvial plain of the Tijuana River with tributary canyons and hillsides extending up into Mexico, and diverse topography extending eastward into the Otay Mesa area. The Tijuana River and the Pacific Ocean are the most notable hydrologic features of the area. Biological resources range from the diverse flora and fauna of the Tijuana River estuary, to scrub habitats adjacent to the estuary extending eastward to developed/disturbed areas. Climate and meteorological influences include the cool semiarid steppe climate of the area with warm dry summers, mild winters, and ocean breezes. The air quality is generally characterized as being fair to good, although the San Diego Air Basin is in nonattainment with federal standards for ozone.

3.1 Climate, Air Quality, and Noise

The area of influence for this project would, in general, include the San Diego Air Basin (SDAB), although only those areas directly adjacent to the international border would be subject to potential localized air quality impacts such as those related to dust or odors arising from the construction and operation of wastewater infrastructure in Mexico.

3.1.1 Climate

The climate in San Diego County is influenced by the Pacific Ocean and its high-pressure systems, which result in dry, warm summers and mild, occasionally wet winters. The normal wind pattern throughout the County is predominantly westerly to

northwesterly (i.e., blows predominantly towards the east and southeast) (City of San Diego Metropolitan Wastewater Department (MWWD, 1996). This pattern is occasionally disrupted by the Santa Ana wind conditions, during which offshore winds blow pollutants out to the ocean, resulting in clear days. If the Santa Ana conditions are combined with a low pressure system in Baja California, a pollutant laden air mass is drawn southward from Los Angeles and Orange Counties to produce some of the highest levels of air pollution found in the SDAB (MWWD, 1996) (CH2M HILL, 1998).

During the winter, afternoon temperatures vary from 60 °F to 80 °F, summer temperatures range from 80 °F to 100 °F. The average annual precipitation in the area is 9.5 inches, falling predominantly from November through April. (MWWD, 1996) (CH2M HILL, 1998).

3.1.2 Air Quality

Ambient Air Quality Standards

The federal Clean Air Act (CAA) of 1970 and the CAA Amendment in 1977 required the adoption of national ambient air quality standards (NAAQS) for sulfur dioxide (SO2), carbon monoxide (CO), nitrogen dioxide (NO2), hydrocarbons (HC), ozone (O_3), particulates of less than 10 microns in size (PM-10) and lead (Pb). In addition, the California Air Resources Board (CARB) has established state standards that are generally more restrictive than the NAAQS, and include sulfates, hydrogen sulfide (H_2S), vinyl chloride, and visibility reducing particles (Table 3-1).

Table 3-1
State and Federal National Ambient Air Quality Standards
Maximum Concentration Averaged Over Specific Time Period

Pollutant	State Standard	Federal Standard
Oxidant (Ozone)	0.09 ppm (180 ug/m^3) 1hr	0.12 ppm (235 ug/m^3) 1hr
Carbon monoxide	9.0 ppm (10 mg/m^3) 8hr	9.0 ppm (10 mg/m^3) 8 hr
Carbon monoxide	20 ppm (23 mg/m^3) 1hr	35.0 ppm (40mg/m^3) 1hr
Sulfur dioxide	0.04 ppm (105 μg /m^3) 24hr	0.03 ppm (80 μg /m^3) annual average
Nitrogen dioxide	0.25 ppm (470 μg/m^3) 1hr	0.053 ppm (100 μg/m^3) annual average
Lead	1.5 μg/m^3 30-day average	1.5 μg /m^3 calendar quarter
Suspended particulate matter (PM10)	50 μg /m^3 24 hr 20 μg /m^3 Annual Arithmetic Average	150 μg /m^3 24 hr* 50 μg /m^3 Annual Arithmetic Average**

Source: California Air Resources Board (CARB) 2005a. Ambient Air Quality Standards
* Not to be exceeded more than once per year
** Not to exceed 50 g/m^3 for a three year average

A common expression of ambient air quality is the number of days air pollution levels exceed the federal and state standards shown in Table 3-1. Table 3-2 shows the annual number of days that pollutants exceeded the state and federal ambient air quality standards in the SDAB during 2000 to 2004.

Table 3-2
Summary of Air Quality Data for the San Diego Air Basin

Pollutant		Number of Days Over Standard				
		2000	2001	2002	2003	2004
Ozone	Federal	0	2	0	1	1
	State	24	29	15	23	12
Carbon Monoxide	State and Federal	0	0	0	0	0
Sulfur dioxide	State and Federal	0	0	0	0	0
Nitrogen dioxide	State and Federal	0	0	0	0	0
Lead	State and Federal	***	***	***	***	***
Particulates (PM10)*	Federal Annual Arithmetic Average (ug/m^3)	no	no	yes*	yes*	yes*
	Federal 24-Hour	no	no	no	no**	no
	State Annual Arithmetic Average (ug/m^3)	yes	yes	yes	yes	yes
	State 24-Hour	yes	yes	yes	yes	yes
Particulates (PM2.5)*	Federal Annual Arithmetic Average (ug/m^3)	yes	yes	yes	yes	no
	Federal 24-Hour Concentration	yes	no	no	no**	yes
	State Annual Arithmetic Average (ug/m^3)	yes	yes	yes	yes	yes

Source: San Diego Air Pollution Control District (SDAPCD, 2004).
*Exceeding only at the Otay Mesa Monitoring location
**Unusually high levels due to wild fires in 2003. Data without wildfires shows no exceedences.
*** Data not available, however, SDAB is designated as an attainment area for lead (SDAPCD, 2004).

Ozone

Ozone is produced as the end result of a chain of chemical reactions that produce a photochemical smog from hydrocarbon emissions. This, combined with climatological and meteorological factors, have made it difficult to control ozone concentrations in the SDAB. As a result the SDAB currently has a federal ozone designation of nonattainment, and state ozone designation of "serious" nonattainment (CARB, 2005b).

Particulates

The SDAB is in attainment with the federal standards for both PM-10, and PM-2.5, but is currently listed in non-attainment status with the state for both standards (CARB, 2005b). The state standards have been difficult to meet due to natural particulate matter sources and the area's dry climate (SDAPCD, 2004).

Local air pollution sources from within the area of influence (i.e., from sources within the US) include vehicular air pollution on Interstate 5 and the more developed pockets along the border such as around the border crossing; and aircraft operations associated with Brown Field and the Imperial Beach Naval Auxiliary Landing Field; and general urban activities within.

3.1.3 Noise

The area of influence with respect to noise is limited to those areas in the US that are immediately adjacent to the international boundary.

Due to the highly urbanized nature of Tijuana near the international border and the existing noise environment throughout much of the urbanized area immediately adjacent to the border within the US, the study area is characterized primarily by vehicular noise from car and truck travel, commercial aircraft noise from operations at the Aeropuerto de Tijuana, and general urban activities. Local noise sources from within the area of influence include vehicular noise on Interstate 5 and local roads, aircraft operations associated with Brown Field and the Imperial Beach Naval Auxiliary Landing Field, and general urban activities within the more developed pockets along the border such as around the border crossing stations. Ambient noise levels are estimated to range from approximately 45 decibels A-weighted (dBA) in remote undeveloped areas to over 70 dB near freeways and highly urbanized areas.

Noise Standards

The City of San Diego established noise ordinances that regulate construction and operation noise levels on specific types of land uses. Although these noise ordinances do not apply to activities occurring outside of the US, they provide a reasonable basis for evaluating the significance of potential noise impacts associated with the proposed action. Ordinance 59.5.0404 states that construction noises may not exceed 75 decibels equivalent sound level (dB Leq) between 7:00 A.M. and 7:00 P.M. in residential areas. Operational noise levels (established in Ordinance 59.5.0401) vary by land use type, and are lower during the nighttime. Residential uses range from 45 dB Leq to 60 db Leq, commercial ranges from 60 dB Leq to 65 dB Leq, and industrial uses have a limit of 75 dB Leq (Recon, 1994).

Sensitive Noise Receptors

Sensitive noise receptors typically include residential development, schools, and hospitals. Under certain conditions, habitat areas can also be considered to be sensitive receptors, such as when noise levels exceed 60 dBA in nesting areas for least Bell's vireo (*Vireo bellii*) and California gnatcatcher(*Polioptila californica californica*) during the respective breeding seasons. Federal regulatory guidelines establish the following breeding seasons for these two species: February 15 through August 30 for the least Bell's vireo, and April 10 through July 31 for the California gnatcatcher.

In general, the presence of such receptors is limited to the western portion of the area of influence. Rural residential development occurs in and near the Tijuana River estuary. Residential subdivisions occur to the north of the Tijuana River between Dairy Mart Road and Interstate 5, as does a public school located southwest of the Interstate 5/Via de San Ysidro interchange. With the exception of areas immediately adjacent to Interstate 5, the area of influence east of Interstate 5 is generally undeveloped or is occupied by non-sensitive uses such as agricultural or industrial/business park development.

3.2 Floodplains

The Tijuana River valley consists mainly of a broad floodplain surrounded by urban development. Flooding is a major issue on the US side in the lower Tijuana River valley (SDSU, 2000). The 100-year and 500-year Tijuana River floodplain limits in the study area are shown on the US Federal Emergency Management Agency (FEMA) Federal Insurance Administration on Flood Insurance Rate Maps (FIRM) 06073C2161 F, 06073C2162 F, and 06073C2166. A 100-year flood has a 1 percent chance of occurring in any given year, while a 500-year flood has a 0.2 percent chance of occurring in any given year.

3.3 Wetlands

The Tijuana River National Estuarine Research Reserve and the Tijuana River Valley portion of the study area include one of the largest and most important wetland systems in San Diego County and Southern California. The estuary supports extensive salt marsh and saltpan habitats. Significant efforts are being made to eliminate pollution, restore wetlands, and reintroduce endangered species into this environmentally sensitive area. The City of San Diego's Multiple Species Conservation Program (MSCP) proposes to preserve these areas and their natural habitats. The County of San Diego is acquiring land for the development of a regional park in the Tijuana River Valley (SDSU, 2000).

3.4 Coastal Zones

The coastal zone boundaries as delineated by the California Coastal Commission are shown on the Local Coastal Program Status Map dated July 1, 2005. Per the California coastal Act of 1976, any development activities within the coastal zone boundary must be approved by either the Coastal Commission or the local government. None of the actions proposed, as described in Section 2, will be within the coastal zone in the US as defined by the California Coastal Commission.

3.5 Water Resources

3.5.1 Surface Water

Pacific Ocean

The Pacific Ocean along the coast of San Diego County is within the area of influence of the proposed action (Figure 1-1). Ocean water quality in the vicinity of the international border may be affected by surface runoff and by discharges from wastewater plants. A brief description of these treatment plants is provided below.

Rosarito WWTPs

Rosarito, located 30 kms (18 miles) south of the border, has two secondary wastewater treatment plants discharging directly to the Pacific Ocean – Rosarito WWTP and Rosarito Norte WWTP- with respective capacities of 60 L/s and 140 L/s and anticipated upgrades to 120 L/s and 210 L/s in 2006. The proposed action would connect unserved communities to these WWTPs.

San Antonio De Los Buenos WWTP

The San Antonio de los Buenos plant, built in 1987 and upgraded in 2003, has capacity to treat up 1,100 L/s (25 mgd) of Tijuana wastewater. The plant includes a pumping station, aeration and sedimentation ponds, chlorination system, electrical substation, offices, laboratory and a blower building. The plant discharges effluent into the Pacific Ocean.

The plant is located approximately 15 km (9 miles) south of the border and discharges a combination of treated wastewater and chlorinated-only wastewater directly into the ocean. The latter is a result of influent flows exceeding the plant capacity. It has been posed that the coastal currents in the region sometimes move from south to north (see description below), creating the possibility that some discharges from the San Antonio de Los Buenos Wastewater Treatment Plant affect the quality of the water along the coastal US.

South Bay International Wastewater Treatment Plant

The South Bay International Wastewater Treatment Plant (SBIWTP) is located in San Diego and treats wastewater from Tijuana at an "advanced primary" level. The SBIWTP discharges into the bay through the South Bay Ocean Outfall (SBOO), an underwater ocean outfall pipe, which helps to dilute effluent entering the ocean and to reduce environmental impacts. However, this plant does not meet US quality standards for several parameters, among them toxicity. There are plans to provide secondary level treatment, although to date the type of technology to be used and the location of the secondary treatment module are still undecided.

Tecolote-La Gloria WWTP

The Tecolote-La Gloria WWTP is one of the four plants being financed by the Japanese Credit Bank. The plant is expected to be operational in 2008. It will have a treatment capacity of 380 L/s and will discharge effluent directly into the Pacific Ocean.

The Tecolote-La Gloria WWTP will provide secondary treatment through two potential methods, oxidation ditch or conventional activated sludge. The plant capacity of 380 L/s includes construction of two modules of primary and secondary treatment of 190 L/s each. This would satisfy demands until the year 2015. The project anticipates the construction of a third module, increasing capacity to 570 L/s, which would satisfy demands until the year 2025 (CESPT 2004).

The currents found along the coast of California are controlled mainly by the offshore, southward-flowing California current, which consists of a (1) broad southerly current that flows near the edge of and beyond the continental shelf, (2) an undercurrent flowing northerly under the southern current, and (3) coastal countercurrents flowing northerly at the surface and near surface (Recon, 1994). The California current varies in position and intensity based on the season, shifting onshore during the spring and summer. The northward flowing countercurrent is found at a depth of 90 feet and flows from Baja California to northern California, bringing warm, high salinity Equatorial Pacific water. There is an equatorial coastal flow that occurs with the northerly

undercurrent from early spring to fall caused by wind stresses. Once the wind stresses subside (September) a broad northward surface current called the Davidson current begins to develop approximately 62 miles offshore. The dynamics of the flows are influenced by the interactions of the coastal currents within the California system and the seasonal upwelling events that bring cool, dense water to the surface (Recon, 1994).

Modeling of the flow patterns found the principal pattern to be a relatively uniform longshore flow north and south along the coastline, and a recurring eddy with counterclockwise circulation south of Point Loma of varying intensity found anywhere from 9.92 to 14.88 km (6.2 to 9.3 miles) offshore and roughly 16.96 km (10.6 miles) alongshore (CH2M HILL, 1998).

Marine Water/Sediment Quality

The City of San Diego performs monthly compliance monitoring for the SBOO. The sampling area extends from the tip of Point Loma southward to Punta Bandera, Baja California, Mexico, and from the shoreline seaward to a depth of 200 ft. Monthly mean data for water temperature, salinity, density, pH, transmissivity (XMS), dissolved oxygen (DO), and chlorophyll a are presented in Table 3-3 (City of San Diego, 2004).

Table 3-3
Monthly Mean Values of Selected Water Quality Parameters during 2004*

Month	Temp (^{o}C)	Density (δ/θ)	Salinity (ppt)	D.O. (mg/L)	pH	Chlor (μg/L)	XMS (%)
Jan	13.8	24.84	33.20	8.4	8.1	4.2	83
Feb	13.8	24.83	33.19	8.6	8.2	4.4	80
Mar	14.2	24.66	33.09	7.8	8.1	3.7	75
Apr	16.7	24.16	33.14	6.9	8.2	3.9	79
May	16.7	24.26	33.29	6.6	8.2	3.1	75
Jun	18.9	23.85	33.43	7.9	8.2	5.1	76
Jul	18.4	24.03	33.50	8.0	8.2	6.0	80
Aug	20.1	23.54	33.44	7.7	8.2	2.3	87
Sep	22.2	22.97	33.44	7.1	8.2	1.4	87
Oct	17.4	24.09	33.26	8.5	8.1	1.8	87
Nov	18.2	23.75	33.08	7.7	8.1	2.0	76
Dec	15.7	24.44	33.20	7.9	8.1	1.3	85

Source: City of San Diego, 2004
*These measurements were taken at the surface (<2 m depth).

Results showed that physical and chemical parameters reflect a seasonal pattern. During the winter, increased surf and wind conditions result in a mixed water column with little thermal stratification. Around April, conditions change due to an intrusion of cold water followed by a warming of surface waters, causing the water column to become well stratified. Summer and fall were marked by a shallow, seasonal thermocline most pronounced between 13 and 30 ft (City of San Diego, 2002).

The water quality characteristics in the vicinity of the SBOO is a result of both oceanographic events and input from point and non-point anthropogenic sources. Physical and chemical parameters were largely affected by stormwater inputs and oceanographic conditions (City of San Diego, 2002).

Sources of bacterial contamination found along the shoreline adjacent to the SBOO may include effluent from the South Bay International Wastewater Treatment Plant; effluent from the San Antonio de los Buenos wastewater treatment plant (and the chlorinated-only wastewater that by-passes the plant); and input from the Tijuana River, and coastal storm drain outlets. The coliform concentrations found offshore were highly variable and ranged between 6 and 4,070 colony forming units (CFU)/mL (City of San Diego, 2002). The City of Imperial Beach regularly monitors for bacterial contamination. Beaches in the vicinity were closed due to bacterial contamination and sewage flows from the Tijuana Estuary for a total of 23 days between April 2005 and March 2006 (San Diego County Department of Environmental Health, 2006).

The waste plume from the SBOO typically remains offshore and at depth, due to the thermal stratification found during most of the year. The plume does surface occasionally under non-stratification conditions. Due to the numerous anthropogenic inputs, it is difficult to make a clear distinction between water quality changes caused by the SBOO and other sources. In general, shoreline sources of contamination tend to affect the nearshore waters. Monitoring results from the City of San Diego 2001 study suggest that discharge from the SBOO does not affect the shoreline and remains at the bottom near the diffuser (City of San Diego, 2002).

Sediments surrounding the SBOO were generally found to be fine sands with a mean particle size of 2.3 phi *(phi = -log_2 (size in mm))*. Higher concentrations of most trace metals and organic compounds were found in finer sediments, but those concentrations found near the SBOO were low when compared to the entire southern California continental shelf. Aluminum, chromium, copper, iron, manganese, zinc, and arsenic were found at all stations. Other contaminants were seen only occasionally; derivatives of the chlorinated pesticide DDT were detected at three monitoring stations, and PCB compounds were present at one station (City of San Diego, 2002).

Tijuana River

The only hydrologic basin that drains directly from Mexico into the US is the Tijuana River basin. The Tijuana River is an ephemeral stream which originates in the Sierra de Juárez and flows southeast-northwest eventually flowing into the Pacific Ocean, in territory belonging to the US via the estuary of the Tijuana River. The main tributary streams of the Tijuana River are the Tecate/Alamar River and the streams of Hechicera, Calabazas and Palmas creeks. It is important to point out that the proposed alternatives are not located within the Tijuana River watershed.

Flows in the river consist typically of a combination of natural runoff, effluent discharges upstream in Tecate and fugitive flow resulting from water and wastewater leaks. The US and Mexico have signed treaties in which Mexico has agreed to intercept the flow of the Tijuana River during the dry season for its eventual transport to a wastewater treatment plant located in Mexico. During the rainy season, however, the Tijuana River flow is allowed to continue into the US and to discharge into the estuary whenever the flow exceeds 500 L/s (11.4 mgd).

Several studies have been conducted to evaluate the water quality of the Tijuana River estuary. These concluded that although sewage containing heavy metals has continued to flow into the river, elevated levels of only cadmium were found in the sediments of the Tijuana River. Additionally, this study noted that only lead was found in levels above an international standard in fish (CH2M HILL, 1998).

The Tijuana River receives secondary effluent from the City of Tecate; consequently, flows within the Tecate River influence the quality and quantity of the water in the Tijuana River. The Tecate treatment plant has historically had effluent quality problems; however the plant has recently been rehabilitated (rehabilitation completed in May 2006). Surface wastewater runoff from the city of Tijuana can also affect the quality and quantity of water in the Tijuana River, whether this is from neighborhoods that lack sewer service or from spills resulting from blockages or collapsed pipes.

CESPT is in the process of implementing several new wastewater treatment plants within the Tijuana River watershed (Figure 2-1). Three plants, El Florido, La Morita, and Monte de los Olivios, could eventually discharge effluent into the Tijuana River, which may reach the Pacific Ocean, as described below. Additional discharge options that would not result in discharges to the Tijuana River are currently being studied by CESPT. These wastewater treatment plant projects do not include any US-side funding sources and are not part of the proposed action in Rosarito. Potential effluent discharges that reach the Pacific Ocean, via the Tijuana River, are considered in the cumulative analysis of this EA.

El Florido WWTP
The El Florido WWTP is projected to be complete in 2007 and will provide advanced secondary treatment. The plant will have a treatment capacity of 127 L/s, and serve industries and colonias in the surrounding area, near the confluence of Matanuco stream and the Tijuana River (CESPT 2004). The El Florido WWTP may discharge effluent directly into the Tijuana River and into the US, eventually reaching the Tijuana River estuary and the Pacific Ocean.

La Morita WWTP
The La Morita WWTP is one of the four plants financed by the Japanese Credit Bank. This plant is projected to initiate operations in 2008, and will have a treatment capacity of 254 L/s. Effluent may be discharged directly into the Tijuana River and into the US and eventually reaching the Tijuana River estuary and the Pacific Ocean. Expansion of the plant capacity to 570 L/s is anticipated, which would satisfy demands until the year 2025 (CESPT 2006).

Monte de los Olivos WWTP
The Monte de los Olivos WWTP is one of the four plants financed by the Japanese Credit Bank. It will have a treatment capacity of 460 L/s and may discharge effluent directly into the Tijuana River and into the US, eventually reaching the Tijuana River estuary and the Pacific Ocean. The plant will provide advanced secondary treatment

and will be constructed in two modules of 230 L/s each (CESPT 2004). The Monte de los Olivos WWTP is projected to initiate operation in 2008.

Cueros de Venado WWTP
The Cueros de Venado WWTP will be located in the vicinity of the Corredor 2000, which is a corridor of new commercial and residential development extending from the Tijuana-Tecate toll road close to the international border in the east side of Tijuana, to the northern end of Playas de Rosarito. The plant would be just west of the Abelardo L. Rodriguez reservoir, within the Tijuana River Basin. The plant is currently in the planning phase and the total capacity has not been determined. The plant is expected to be operational in 2008 and, preliminarily, it is expected to discharge effluent to the Rodriguez reservoir.

Public Law 106-457 WWTP
The Public Law plant is assumed to be located within the Tijuana River basin, and to have a capacity of 1,100 L/s. The plant is assumed to provide secondary treatment by means of conventional activated sludge. Effluent management is assumed to include a combination of reuse in Tijuana and discharge to an effluent line that would convey the effluent to the international border and would be connected to the South Bay Land Outfall, which connects the SBIWTP to the SBOO. Effluent would ultimately be discharged through the SBOO. Under this scenario, the plant would not discharge effluent to the Tijuana River.

3.5.2 Groundwater

Groundwater in the lower Tijuana River Valley occurs in the following three zones: (1) beneath Nestor Terrace north of the valley, (2) in the alluvial fill underlying the Tijuana River valley, and (3) in the San Diego Formation beneath the alluvium. Of the three, the alluvium fill has been most used and studied (CH2M HILL, 1998). The aquifer in this area is unconfined and can potentially store up to 65,000 acre-feet of water. The aquifer rests atop a bedrock surface and, on the average, consists of 50 to 90 feet of sand and silt overlying 10 to 35 feet of interbedded layers of gravel and sand, which are tapped by production wells (Metropolitan Wastewater Department (MWWD), 1996). The primary source of aquifer recharge appears to be the Alamar River, which originates in the coastal San Ysidro Mountains and confluences with the Tijuana River. Other likely sources of recharge are winter rainfall (particularly on undeveloped land north of the border and in Alamar Valley), water line leakage in Tijuana, and discharge from surrounding sedimentary bedrock terraces. Recharge to the alluvial aquifer from the Tijuana River surface flow is more prominent in the US than Mexico, since the Tijuana River is a concrete lined channel from the international border to Rodriguez reservoir. The primary aquifer discharge zone is the Pacific Ocean (US Department of Energy (USDOE), 2003).

Historically, groundwater consumption was related to potable water extraction for export and agricultural use. The high levels of pumping during the 1950s resulted in a lowering of groundwater levels of 23-30 feet. By the 1960's, groundwater levels had

dropped below sea level, allowing highly saline groundwater and seawater to flow into the water (Recon, 1994).

Several factors, including imported irrigation water, reduced pumping due to degraded groundwater quality, and the abandonment of farming activities have contributed to the decline in groundwater usage since 1952 (MWWD, 1996). This has allowed groundwater levels to recover to within 0 to 15 feet of the ground surface (CH2M HILL, 1998). There is currently no known extraction of groundwater from the Tijuana River basin in the US for any purpose except limited agricultural use (MWWD, 1996). As of 1993, groundwater extraction in the Tijuana River valley north of the international border was 1,400 afy (Dudek, 1997).

Goundwater Quality

Currently, the quality of groundwater in the basin is characterized by high levels of total dissolved solids and sodium chloride, which prevents the use of groundwater for salt-sensitive crops. Water quality has been rated generally inferior for domestic use due to high sulfate and fluoride concentrations. In addition, it was rated inferior for irrigation purposes because of high electrical conductivity, high chloride levels, and a high percentage of sodium (Recon, 1994). Table 3-4 shows a summary of water quality data collected by the US Department of Energy for the Groundwater Flow Model for the Tijuana River Basin Project.

Table 3-4
Groundwater Data Collected for the Groundwater Flow model for the Tijuana River Basin Project[2]

Constituent	**Na**	**K**	**Ca**	**Mg**	**Cl**	**SO_4**	**Alk[1]**	**DO**	**Fe**	**pH**	**Sr**	**TDS**
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Minimum Concentration	154	3.04	83.6	25.3	174	135	161	0.47	0.0044	6.79	0.45	858
Maximum Concentration	1940	15.9	486	257	2310	4120	789	5.49	18.7	8.19	3.76	9030
Average Concentration	**511.5**	**7.33**	**199.9**	**87.8**	**768.6**	**524**	**416.8**	**1.9695**	**2.41**	**7.23**	**1.62**	**2413**

(USDOE, 2003)
[1] Alkalinity as mg/L of $CaCO_3$.
[2] Samples collected by DOE personnel at 31 well locations, from IBWC wells in the USA and from municipal water wells in Mexico. Samples collected from Aug 26-30, 2002.
Note: Alk = alkalinity; Ca = calcium; Cl = chloride; DO = dissolved oxygen; Fe = Iron; K = potassium; Mg = magnesium; Na = sodium; pH = measure of H^+ ions in solution; SO_4 = sulfate, TDS = total dissolved solids; Sr = strontium.

The following information regarding sources that may alter groundwater quality was taken directly from the report prepared by the US Department of Energy titled "Conceptual Model for the Tijuana River Aquifer Southwest Border Project" dated September 2002. Several factors have contributed to the poor quality of groundwater in the Tijuana River valley, including the following:

- ***Rainfall:*** In industrial areas such as the Tijuana Basin, rainfall is typically slightly acidic (pH 5.5-6) as a result of sulfide emissions and subsequent oxidation to sulfate.

Rainfall probably also contains seawater chemicals from sea spray near the ocean margin. As rainfall infiltrates through the saline soils in the Tijuana Valley, additional salts are dissolved in the groundwater (USDOE, 2002).

- ***Tijuana River Recharge:*** Recharge to the alluvial aquifer from the Tijuana River occurs mostly during high water stages. Although most of the river water recharging the aquifer is relatively low in TDS, it often contains anthropogenic contamination including metals (e.g., copper, lead, and zinc) from industrial effluents and municipal waste (e.g., nitrogen and organic carbon compounds) discharged from the City of Tijuana. Recharge from Tijuana River losses is most prominent in the US because the river is concrete-lined in Mexico (USDOE, 2002).

- ***Municipal Discharges:*** Groundwater chemistry in the alluvial aquifer may also be affected by direct recharge from pipes and drains in the City of Tijuana; this recharge is relatively low in dissolved salts, but high in industrial or municipal contaminants. The Colorado River is the main water source for Tijuana, and likely has a TDS concentration of about 500 mg/L (USDOE, 2002).

- ***Ocean Water Intrusion:*** Beneath the Pacific Ocean for a distance of about 1 mile inland from the coast, groundwater in the Tijuana alluvium has the composition of ocean water (TDS = 34,000). During the 1960s, the alluvial aquifer was pumped at high flow rates, resulting in further intrusion of the ocean water. Similarly, extensive pumping or injection of reclaimed water in the Lower Tijuana River Valley could cause substantial changes in groundwater salinity due to ocean intrusion (USDOE, 2002).

- ***Localized Sources:*** Hydrothermal activity causes additions of hydrogen sulfide and other constituents to groundwater in the San Diego Formation below the Nestor terrace (Izvicki, 1985). Hydrothermal water may locally modify groundwater in the alluvium. Recharge from septic systems, leaking storage tanks, and other small sources of water can locally alter groundwater composition (USDOE, 2002).

- ***Chemical Evolution:*** Several processes may take place within the aquifer that can modify the chemistry of groundwater from its original composition. Dissolved chemicals can be added or removed by precipitation and dissolution of minerals. An example of a process that commonly occurs is the addition of carbon dioxide to infiltrating water caused by plant respiration in the root zone. This process causes pH to decrease which leads to dissolution of carbonate minerals. Ion exchange can alter the ratios of dissolved ions in the groundwater. Ion exchange takes place at the surfaces of clay and oxide minerals by exchanging one ion for another. A common example is the exchange of calcium for sodium. Adsorption of metals is another common process that can alter the groundwater chemistry (USDOE, 2002).

3.6 Biological Resources

Biological resources in the study area could be indirectly affected by construction activities in Mexico that occur in the vicinity of biological resources within the Tijuana

River and Estuary to the extent that construction activities may affect the habitat of migratory birds or marine species. However, construction associated with the proposed action would occur in Rosarito some 30 km (18 miles) to the south previously disturbed areas and would not be in the vicinity of the Tijuana River and Estuary.

The western portion of the study area has been developed and contains extensive amounts of disturbed habitat. The eastern portion of the study area is relatively undisturbed, and is covered largely by costal sage scrub and chaparral vegetation. The eastern portion also contains southern interior cypress forest, particularly near Otay Mountain, which is within the Multiple Species Conservation Program (MSCP). The US federal government set aside approximately 18,500 acres of land in the Otay Mountain area to preserve the habitat. This area is known as the Otay Mountain Wilderness Area. The following is a description of the vegetation and wildlife within specific areas of concern, including the Tijuana Estuary, and the Otay Mountain area. A description is also provided for migratory wildlife, and federal and state endangered species.

3.6.1 Vegetation

Vegetation within Tijuana Estuary

Portions of the Tijuana River Valley, as it extends west from the international border to the Pacific Ocean support a variety of biological resources. For the most part, the portion of the River Valley located between the international border and Dairy Mart Road is devoid of notable biological resources due to a combination of factors including the channelization of the Tijuana River in the eastern portion of this segment, current development, and past and present agricultural and mining activities. Areas west of Dairy Mart Road and north of Monument Road include pockets of dense riparian habitat that support a variety of bird species and are high in habitat value. The subject area is interspersed with agricultural, equestrian, mining, and rural residential uses, but, overall, is still rich in wildlife values. The most notable area of biological resources is the Tijuana Estuary, which extend approximately 3 miles east from the Pacific Ocean. The Tijuana Estuary is an essential breeding, feeding, and nesting ground, providing an important stopping place on the Pacific Flyway for over 370 bird species (SDSU, 2000).

The Tijuana Estuary is part of the National Estuarine Research Reserve (NERR) System and is classified as a Coastal Plain Estuary. Several different habitats occur within the Estuary including, but not limited to, sand dunes and beaches, open tidal channels and mudflats, salt marshes (low, middle, and high); fresh-brackish marshes dominated by bullrushes and cattails, and upland riparian habitats. The Estuary includes cordgrass (*Spatina foliosa*), pickleweed (*Salicornia spp.*), saltwort (*Batis maritima*), shoregrass (*Monanthochloë littoralis*), and the endangered salt marsh bird's beak (*Cordylanthus maritmus maritimus*).

Along the western side of Dairy Mart Road there are several areas of southern cottonwood-willow riparian forest that are known to support breeding habitat for the Least Bell's Vireo, a state and federally listed endangered species (MWWD, 1996). Such breeding territory includes the area immediately north of the intersection of Monument Road and Dairy Mart Road.

Habitat suitable for infrequent use by the California gnatcatcher (*Polioptila californica californica*), a federally listed threatened species, occurs south of the intersection of Monument Road and Dairy Mart Road (MWWD, 1996).

3.6.2 Wildlife

Wildlife within Tijuana Estuary

The Tijuana Estuary also is home to more than 370 species of birds, of which about 320 are migratory, included four federally listed endangered birds: the light-footed clapper rail (*Rallus longirostris levipes*), the California least tern (*Sterna antillarum browni)*, the least Bell's vireo (*Vireo bellii pusillus*), and the California brown pelican (*Pelecanus occidentalis californicus)*. Occasional visitors include peregrine falcons (*Falco peregrinus*), bald eagles (*Haliaeetus leucocephalus)*, and golden eagles (*Aquila chrysaetos)*. The Estuary is used for staging and wintering by a variety of waterfowl and shorebirds, with more than 20 species occurring regularly along the sandflats and mudflats. The Estuary also supports a small mammal population, including mice, California ground squirrels and rabbits. At least 20 species of fish reside in the small tidal creeks and channels of the estuary, and large populations of crabs, rove beetles, tiger beetles, and wandering skippers can be found as well.

Migratory Species

According to the "Manifestación de Impacto Ambiental" of the Tijuana and Playas de Rosarito Water and Wastewater Master Plan (CDM 2003), 127 species of birds occur on the Baja Californian peninsula of Mexico, particularly in the general area of the Master Plan. Of these species, all except six are included on the list of migratory birds recognized by the US Migratory Bird Treaty Act (MBTA). Of the 121 species, thirty-seven are listed as threatened or endangered by the US federal Endangered Species Act.

3.6.3 Federal and State Threatened and Endangered Species

Table 3-5 presents a list of Federal and State threatened and endangered species for the Imperial Beach quad, according to the California Department of Fish and Game sources. Species listed for the Imperial Beach quad have the potential to occur in the vicinity of the Tijuana River, the Estuary, or along the coast.

Table 3-5
List of Threatened and Endangered Species in Imperial Beach Quad

Scientific Name	Common Name	Federal Status	California Status
Rallus longirostris levipes	light-footed clapper rail	Endangered	Endangered
Charadrius alexandrinus nivosus	western snowy plover	Threatened	None
Sterna antillarum browni	California least tern	Endangered	Endangered
Polioptila californica californica	coastal California gnatcatcher	Threatened	None
Vireo bellii pusillus	least Bell's vireo	Endangered	Endangered
Passerculus sandwichensis beldingi	Belding's savannah sparrow	None	Endangered

Table 3-5 (continued)
List of Threatened and Endangered Species in Imperial Beach Quad

Scientific Name	Common Name	Federal Status	California Status
Perognathus longimembris pacificus	Pacific pocket mouse	Endangered	None
Branchinecta sandiegonensis	San Diego fairy shrimp	Endangered	None
Streptocephalus woottoni	Riverside fairy shrimp	Endangered	None
Eryngium aristulatum var. parishii	San Diego button-celery	Endangered	Endangered
Ambrosia pumila	San Diego ambrosia	Endangered	None
Deinandra conjugens	Otay tarplant	Threatened	Endangered
Ornithostaphylos oppositifolia	Baja California birdbush	None	Endangered
Phacelia stellaris	Brand's phacelia	Candidate	None
Acanthomintha ilicifolia	San Diego thorn-mint	Threatened	Endangered
Pogogyne nudiuscula	Otay Mesa mint	Endangered	Endangered
Navarretia fossalis	spreading navarretia	Threatened	None
Rosa minutifolia	small-leaved rose	None	Endangered
Cordylanthus maritimus ssp. maritimus	salt marsh bird's-beak	Endangered	Endangered
Fremontodendron mexicanum	Mexican flannelbush	Endangered	Rare
Orcuttia californica	California Orcutt grass	Endangered	Endangered
Orcuttia californica	California Orcutt grass	Endangered	Endangered

Source: California Department of Fish and Game - http://imaps.dfg.ca.gov/viewers/cnddb_quickviewer/

3.7 Cultural Resources

In the general vicinity of the study area, the cultural resources in the US are within Native American reservations including Campo, La Posta, and parts of the Cuyapaipe and Manzanita. These cultural resources will not be affected because there are no proposed alternatives that involve development activities within the US.

3.8 Socioeconomics

According to the 1995 census (INEGI 2006) the population of the municipality of Playas de Rosarito in 1995 was 73,305. The Tijuana and Playas de Rosarito Master Plan (CDM, 2003) projected this population to increase to 231,577 by the year 2020. The population of the Municipality of Tijuana in 2005 was estimated by INEGI at 1,410,700, and is projected to reach 2,636,594 by the year 2030 (CDM, 2003).

Economic activity in Tijuana and Playas de Rosarito revolves around the service (or tertiary) sector, mainly commerce and tourism. In 1998, 56 percent of the economically-active population of the area was employed in this sector. In 1998, 18 percent of the people employed in the tertiary sector worked in commercial activities, while 29 percent were employed in tourism (CDM, 2003).

The secondary or industrial sector also contributes to the economic activity of the area, although at a smaller level than the tertiary sector. The main activity of this sector is the export-oriented industry, commonly referred to as *maquiladoras*, which has played a major role in the economic growth of Tijuana in recent years.

According to the "Economic Impacts of Wait Times at the San Diego – Baja California Border"(SANDAG, 2006) over 60 million people cross the San Diego County – Baja California border annually. Approximately half of these trips are for shopping and recreation, while approximately 10 million trips per year are made to and from work. In addition, 730,000 trucks cross this border annually from Mexico.

Given the high interrelationship between people in Tijuana, Playas de Rosarito, and San Diego, public health issues on one side of the border may impact residents on the other side. Improving sanitary and environmental conditions, and public health conditions in general, in Rosarito and Tijuana would be beneficial to San Diego County.

3.9 Topography and Geology

Topographic features include the relatively flat alluvial plain of the Tijuana River with tributary canyons and hillsides extending up into Mexico, and diverse topography extending eastward into the Otay Mesa area.

The elevations in the study area range from sea level on the west to more than 3,550 feet in Otay Mountain in the east. The western portion is composed of flat marine terraces comprised of conglomerate and other sedimentary rocks that are dissected by steep-sided valleys. Severe erosion has left few remnants of upland areas in the western area. To the east, the urban zone of Otay-Mesa is located in the large areas of relatively flat upland areas. The far eastern portion is the most rugged section and is characterized by deeply dissected terrain developed on rocks that are largely igneous in nature (SDSU, 2000).

Section 4
Environmental Consequences

This section describes the environmental consequences of the no action and proposed action alternatives. The environmental consequences considered include the direct, indirect, and cumulative impacts, specifically to environmental resources in the US. CEQ regulations §1508.8 define direct impacts as impacts caused by the action and occur at the same time, and indirect impacts as impacts caused by the action and occur at a later time or are farther removed in distance.

Cumulative impacts are defined as the impacts of an alternative when combined with impacts of past, present, or reasonably foreseeable future actions undertaken by any agency or person. Impacts of actions planned for the medium- and long-term under each alternative would constitute a portion of the cumulative impacts for that alternative. Other projects in communities in the vicinity of Playas de Rosarito could also potentially produce cumulative effects when combined with these alternatives, particularly other water, wastewater and sanitation projects.

This section describes potential impacts separately for each of the alternatives considered. All types of potential effects (e.g. beneficial, adverse) are identified for each resource (e.g. air, water). Cumulative impacts are discussed as a whole for each alternative. The description of impacts is focused mainly on the US coastal areas that may be affected by discharges into the Pacific Ocean associated with proposed action.

4.1 Potential Impacts of the No Action Alternative

Under the No Action Alternative, wastewater services are not provided for currently unserved communities in Playas de Rosarito. There are six unserved communities that currently rely on latrines or open ditches to meet their wastewater disposal needs:

- Poblado Morelos
- Colinas de Rosarito I y II
- Fraccionamiento la Mina
- Santa Lucía
- Colinas de Montecarlo
- Campestre Lagos

As summarized in Section 2, the population of these areas is estimated at 20,851. Under the No Action Alternative these residents will continue generating wastewater that is disposed of in open ditches and latrines. These residents will generate approximately 60.7 L/s of wastewater, or approximately 1.39 million

gallons per day (mgd), that will reach environmental resources in Mexico without adequate treatment.

The No Action Alternative includes wastewater treatment plants and associated collection systems that existed in 2006 or are authorized, funded projects. The environmental consequences of the authorized and funded WWTP and collection system projects are considered in the cumulative impacts of the alternatives. Additionally, the analysis recognizes that construction will occur under the No Action Alternative to facilitate development in both the US and Mexico; however, this construction is not associated with the proposed action to provide wastewater services to the existing unserved communities in Rosarito. Therefore, construction activities are not considered in the No Action Alternative analysis, but are discussed in the cumulative analysis.

Table 4-1 presents a summary of transboundary environmental impacts resulting from the No Action Alternative. It is important to note that the No Action Alternative would have more severe effects to resources in Mexico because of the environmental and public health risks associated with inadequate collection, treatment and disposal of wastewater in Rosarito. The following impact discussions focus on resources within the US. Direct and indirect impacts are discussed for each environmental resource and cumulative impacts are discussed for each alternative as a whole.

Table 4-1
Summary of Impacts to the United States Resulting from the No Action Alternative

Air Resources	No Impact
Water Resources	Less than significant
Floodplains	No Impact
Wetlands	No Impact
Biological Resources	Less than significant
Cultural Resources	No Impact
Coastal Resources	No Impact
Socioeconomics and Public Health	Less than significant
Topography and Geology	No Impact
Cumulative Impacts	No Impact

4.1.1 Air Resources

There would be no direct or indirect impacts to the US air resources as a result of the No Action Alternative. Air quality under the No Action Alternative would not be affected because the unserved Playas de Rosarito communities would remain unconnected to the wastewater system. There would be no transboundary effects on air resources, such as those arising by dust or particulate matter emissions from construction activities.

There would be no noise generation impacts because construction activities of the proposed action would not take place.

Offensive odors may result near the unserved areas as a result of inadequate wastewater disposal and treatment. These odors would not reach the US because of the distance of proposed projects to the US-Mexico border.

4.1.2 Water Resources

Surface Water

The No Action Alternative would result in the continued disposal of untreated wastewater to the environment, particularly to surface water courses near the unserved areas. As previously indicated, it is estimated that 60.7 L/s (1.39 mgd) of untreated wastewater will reach the environment in Mexico. A portion of this flow will eventually reach the Pacific Ocean approximately 30 km (18.8 miles) south of the US-Mexico border.

Raw wastewater discharges to the ocean would increase bacteria concentrations in the areas of discharge. Combined with stormwater runoff, the raw wastewater would cause degradation of coastal water quality near Playas de Rosarito. This would have a direct adverse impact to water quality in inland streams and coastal waters of Rosarito.

Indirect impacts to US coastal waters could occur if ocean currents carry contaminants north past the international border. Ocean currents in this region typically experience a southward flow regime, although there are some exceptions in which the ocean currents flow northward or overall weak current conditions cause a plume to spread in both directions (Ocean Imaging, 2002). During these times, discharges from Playas de Rosarito may reach US waters; however, considering the distance to the border, natural attenuation and dilution, and the effects on the US water quality of other less distant sources, such as the Tijuana River, the San Antonio de los Buenos wastewater treatment plant (WWTP) in Tijuana, the South Bay IWTP, San Diego's South Bay Water Reclamation Facility, and San Diego's Point Loma WWTP, the potential incremental impact of the No Action Alternative on water resources and water quality in the US would not be significant.

Groundwater

Groundwater may be adversely affected in localized areas in Playas de Rosarito near latrines and along surface water courses where untreated wastewater is discharged.

In addition, there might be indirect adverse impacts to coastal water resources as a result of groundwater flow to the ocean.

Groundwater resources in the US would not be directly or indirectly affected by the No Action Alternative.

4.1.3 Floodplains

Floodplains in Mexico or the US would not be affected under this alternative because no construction would take place. There would be no dredging or filling of material within the floodplain limits. The No Action Alternative would not have any direct or indirect impacts to US floodplains.

4.1.4 Wetlands

The No Action Alternative would not have any direct or indirect impacts on wetlands in the US. As discussed under Section 4.1.2, raw wastewater discharges would likely not have a significant impact on US coastal water, and thus indirect impacts would not be anticipated on wetlands such as the Tijuana River Estuary.

4.1.5 Biological Resources

Under the No Action Alternative, construction actions related to the proposed action would not occur. There would not be any direct impacts to vegetation and wildlife communities in Mexico or the US, including federal or state threatened and endangered species in the US, as a result of construction. A potential indirect impact on US biological resources relates to migratory species that may travel between areas in Playas de Rosarito and the US.

Under the No Action Alternative, raw wastewater would continue to affect streams and coastal areas in Mexico. Effects on migratory bird habitat in Playas de Rosarito would likely be minor as the project area is highly developed and offers little bird habitat.

Raw wastewater discharges to streams and the Pacific Ocean have the potential to adversely affect aquatic life in Mexico. Discharges from Rosarito would not usually reach coastal waters of the US because of the 30 km (18 mile) distance and the natural southward flow of currents in the Pacific Ocean. During times of northward current flow, discharges from Playas de Rosarito may reach US waters but would experience natural attenuation and dilution given the considerable distance to the border. Therefore, raw wastewater from Rosarito would not indirectly or directly affect coastal vegetation, wildlife, and fish.

4.1.6 Cultural Resources

The No Action Alternative would not affect cultural resources in Mexico or in the US. Construction activities related to the proposed action would not occur; therefore, there would not be any direct or indirect impacts to cultural or archaeological resources.

4.1.7 Coastal Resources

The No Action Alternative would not affect directly or indirectly coastal resources in the US. There would not be any construction activities related to the proposed action that occur within a US coastal zone to adversely affect these resources.

4.1.8 Socioeconomics and Public Health

Under the No Action Alternative, the socioeconomic conditions of the area would not change compared to existing conditions. The No Action Alternative would not improve the standard of living of the residents of unserved areas in Playas de Rosarito, nor directly affect the standard of living of residents of the US. Frequent border crossings for tourism and industry would continue and the economic and personal ties that are common across the border would not be affected under the No Action Alterative.

The No Action Alternative could have direct and indirect impacts on US public health. Without adequate wastewater collection systems in Playas de Rosarito, there is the potential to affect localized water distribution lines through infiltration and inflow, as well as water bodies, including the Pacific Ocean, and groundwater resources. Public health in Playas de Rosarito would be negatively affected by the No Action Alternative, as exposure to raw sewage in open canals and potential contamination of potable water supplies are both pertinent health risks. This could have direct impacts to US public health as US residents frequently visit Rosarito. US residents may be exposed to contamination through water consumption or direct contact in the ocean. Indirect impacts could occur if US residents that got sick from exposure to raw sewage in Rosarito spread disease in the US upon their return. Due to the frequency of US-Mexico border crossing, the public health in the US is at risk under the No Action Alternative, although effects would not likely cause any major health problems for the US.

The No Action Alternative would not have any indirect impacts to recreation and tourism at US beaches because ocean currents tend to experience a southward flow regime and contaminants from Rosarito's raw sewage discharges would not reach US beaches. Therefore, visitation to beaches would not decline as a result of raw sewage discharges from the unserved areas. Section 4.1.2 further discusses impacts to US coastal waters.

Environmental justice refers to equitable rights to healthy environmental conditions for poor and minority populations relative to other populations. Most populations in the US rely on an adequate supply of potable water and sanitary disposal and treatment of wastewater for all households. The No Action Alternative would not affect any environmental justice populations in the US. The decision to be made on the proposed project is how to provide wastewater service to currently unserved communities in Playas de Rosarito, and thus will not affect water and wastewater services to US residents.

4.1.9 Topography and Geology

The No Action Alternative would not directly or indirectly affect topography or geology in Mexico or the US because construction of the proposed action would not take place.

4.1.10 Cumulative Effects

The cumulative analysis defines the cumulative condition and any potential contribution the alternatives could have to cumulative impacts. The cumulative condition includes past, present, or reasonably foreseeable future actions that could have similar impacts as the proposed project. Projects undertaken by any agency or person outside of the control of the sponsoring agency are included in the cumulative condition. For this analysis, the cumulative condition includes planned and authorized wastewater treatment facilities, including the Japanese Credit Bank plants, projects to provide water and wastewater service to unserved areas in the Tijuana River Watershed and Tijuana Coastal areas being developed by BECC, and other water, wastewater and sanitation projects in communities in the vicinity of Playas de Rosarito and Tijuana. The cumulative condition also includes general municipal development within the border region.

The Japanese Credit Bank plants include new, funded wastewater treatment plants that will expand wastewater services to the city of Tijuana, both within the Tijuana River watershed and in coastal areas. Once operational, these plants will reduce raw wastewater discharges into the Tijuana River and local streets and canals. The Tecolote-La Gloria plant is the only plant that would be built in the coastal areas north of Rosarito and is planned to release effluent into the Pacific Ocean. The three Japanese Credit Bank plants located within the Tijuana River watershed may discharge effluent into the Tijuana River, which could reach the Pacific Ocean via the Tijuana River Estuary. Alternatives for the ultimate effluent disposal of these plants are being studied by CEPST. Should the effluent from these plants reach the Pacific Ocean through the estuary, there may be negative cumulative effects on ocean water quality and ocean beaches.

The Tijuana/Playas de Rosarito border region is rapidly growing. In 2005, the population in the municipality of Playas de Rosarito was 73,305 (INEGI, 2005). According to the Water and Wastewater Master Plan (2003), Playas de Rosarito population is projected to increase to 177,815 in 2023. Five-year growth rates would be around 4.3 percent. This population growth would require significant development for housing and public services. Additionally, the manufacturing industry is dominant in this region and will likely continue to grow.

Under the cumulative condition, operation of the Tecolote La Gloria plant would provide additional wastewater services to meet growing demands in coastal Tijuana. This would improve environmental resources within in the local area, including water quality and biological resources. Less raw sewage would reach the Pacific Ocean, which could improve coastal waters. Additional wastewater services would improve public health and the general economy of the region under the cumulative condition,

which could indirectly improve the US border economy and reduce public health risks to US residents.

The No Action Alternative would not include any construction to connect identified communities in Playas de Rosarito to the wastewater system. Therefore, it would not contribute to a general improvement in municipal and sanitary services in the project area. In the US, the border region is largely industrial; however, residential and business development is beginning in the eastern portions of the study area. Under the cumulative condition, the No Action Alternative would not affect any of this development. The No Action Alternative would not result in any cumulative impacts to the US.

4.2 Potential Impacts of Wastewater Conveyance Alignment Alternative A

Action alternatives A and B are identical in the areas and number of people served, the flow of wastewater collected, the wastewater treatment type and location, and the discharge point to the ocean. The only substantial difference between the two action alternatives is the alignment of some of the new sewer lines, resulting in some additional construction for the alignments in Alternative A. This section describes potential direct and indirect environmental impacts on the US of Alternative A. Table 4-2 presents a summary of the transboundary environmental impacts resulting from Alternative A. These impacts are described in more detail below. Given that no adverse impacts are anticipated, mitigation measures are not necessary.

Table 4-2
Summary of Impacts to the United States
Resulting from the Wastewater Conveyance Alignment Alternative A

Air Resources	No Impact
Water Resources	Beneficial Impact
Floodplains	No Impact
Wetlands	No Impact
Biological Resources	Beneficial Impact
Cultural Resources	No Impact
Coastal Resources	No Impact
Socioeconomics and Public Health	Beneficial Impact
Topography and Geology	No Impact
Cumulative Impacts	No Impact

4.2.1 Air Resources

Construction activities could have direct effects to air resources in and around the area of construction. The proposed wastewater infrastructure in Alternative A would generate noise, dust, and construction equipment exhaust during the construction phase. These emissions would be terminated after construction is complete.

Site preparation and construction activities would result in the emission of sulfur oxides, nitrogen oxides, hydrocarbons, carbon monoxide, and particulate matter from equipment exhaust, and particulate matter from fugitive dust. These emissions would be generated from earthwork activities (i.e. grading, trenching/excavation, filling, etc.) and from major hauling operations, if necessary, to remove excavated material or to bring in supplies. Of particular potential concern would be nitrogen oxide emissions, which are a precursor to ozone and are associated with diesel engine exhaust.

Alternative A may have a direct adverse impact on air resources in localized construction areas in Rosarito if construction management practices are not implemented.

Air resources in the US would not be directly or indirectly affected by the proposed project. The San Diego Air Basin is in nonattainment status for State ambient air quality standards for ozone and PM emissions. Construction of the proposed project would take place approximately 30 kilometers (18.8 miles) south of the US-Mexico border, and noise, dust, and exhaust emissions would not be perceived in the US. Construction activities are temporary and the associated emissions would tend to disperse towards the southeast, away from the US, based on the prevailing wind patterns of the area.

The construction activities associated with these alternatives are not in close enough proximity for noise levels to exceed US standards. Based on construction equipment mix and activity level associated with construction of general wastewater infrastructure, construction activity noise levels at 50 feet would be approximately 84 dBA for site clearing, 87 dBA for excavation, 83 dBA for construction, and 82 dBA for finishing (City of San Diego Metropolitan Wastewater Department,1996). Based on standard noise drop-off rate of 6 dBA per doubling of distance, the highest noise level (87 dBA for excavation activities) would naturally attenuate to 75 dBA – the level recognized by the City of San Diego's Noise Ordinance as the maximum acceptable level for construction noise in residential areas – at a distance of 200 feet. This noise level would fall well within Mexico boundaries and would not violate US noise standards. There would not be a noise impact to the US.

During the operational phase, Alternative A would result in a reduction of odors arising from the inadequate disposal of raw wastewater. This alternative would be beneficial to the residents of unserved areas during the operational phase. However, the improvement in odors in the US would be negligible due the substantial distance of the projects.

4.2.2 Water Resources

Alternative A would prevent the discharge of raw wastewater to nearby latrines and open ditches, which could affect local groundwater and ultimately the Pacific Ocean. It is estimated that 60.7 L/s (1.39 mgd) of untreated wastewater would be appropriately collected and treated by this action alternative, thus improving water quality in surface water streams and the ocean in the Playas de Rosarito area. This would be a direct benefit to water resources in the Rosarito area.

This alternative could indirectly benefit coastal waters of the US in the instance that currents move water with improved quality north from Rosarito to the US. However, this potential beneficial impact would not be significantly perceived in the US given typical current patterns in the region, the distance of the effluent discharge points relative to the US, and the natural dilution of effluent that would occur before any effluent may reach the US.

4.2.3 Floodplains

Floodplains would not be directly or indirectly affected under Alternative A because construction would not take place in the US. No transboundary impacts would result from this alternative.

4.2.4 Wetlands

Wetlands in the US would not be directly affected by Alternative A due to its substantial distance from the project area. Any indirect benefits as a result of improved water quality of coastal waters would not reach US wetlands. Therefore, Alternative A would not result in any transboundary impacts to US wetlands.

4.2.5 Biological Resources

Alternative A includes the construction of sewer lines along existing streets in previously disturbed areas. Construction activities would not have any direct effect on habitat and biological resources in Playas de Rosarito, and as such, there will not be adverse impacts to biological resources in the US. Because construction is not proposed in the US, there would not be any direct impacts to biological resources in the US from construction activities. A potential indirect impact on US biological resources relates to migratory species that may travel between areas in Playas de Rosarito and the US. This potential impact would be unlikely because construction will take place in previously disturbed areas that offer little habitat value.

Conditions for biological resources along surface streams in Rosarito where untreated wastewater is currently flowing would be improved, as well as for aquatic life in the ocean near the current discharge points for untreated waste water. This could result in indirect benefits to biological resources in the coastal waters of the US. However, the proposed action would be 30 kilometers south from the US-Mexico border; therefore, potential indirect beneficial impacts that may be observed in the aquatic biological resources in the US would be marginal.

4.2.6 Cultural Resources

Because construction is not proposed in the US and because of the significant distance south of the border, there would not be any direct or indirect impacts to US cultural resources. Construction activities in Mexico would occur in developed areas and would not likely affect Mexico's cultural resources.

4.2.7 Coastal Resources

Because construction is not proposed in the US and because of the significant distance south of the border, there would not be any direct or indirect impacts to areas within the coastal zone boundary associated with Alternative A.

4.2.8 Socioeconomics and Public Health

Alternative A eliminates the discharge of raw wastewater to nearby latrines and open ditches, reducing the potential contamination of localized water distribution lines through infiltration and inflow. The alternative also reduces the potential contamination of local water bodies, including the Pacific Ocean, and groundwater resources. This alternative would have direct and indirect benefits to the region's economy and public health conditions.

Public health in Playas de Rosarito would be positively affected by the proposed action because it would reduce exposure to raw sewage in open ditches and contamination of potable water supplies, which are both pertinent health risks. The improvement of sanitary conditions within the Playas de Rosarito vicinity would promote better overall public health conditions in the area. The region's economy could improve because workers in Rosarito are healthier, which could lead to more productivity, and the region could attract more tourism because potential health threats to visitors would be reduced.

The proposed action could result in indirect transboundary benefits to US public health and the border economy. There are frequent border crossing between the US and the Tijuana-Playas de Rosarito region. Public health in the US could improve because US visitors to Rosarito would not be exposed to raw sewage from the unserved areas. The border economy could also indirectly benefit as a result of better overall health conditions in Rosarito. The potential health threat associated with traveling to Rosarito would be reduced and more US residents may choose to cross the border. This could increase economic activity in the border region of the US.

Environmental justice populations, including low-income populations and minorities, in the US would not be affected by the proposed project. The decision to be made on the proposed project is how to provide wastewater service to currently unserved communities in Playas de Rosarito, and thus will not affect water and wastewater services for populations in the US.

4.2.9 Topography and Geology

Because there is no proposed construction in the US, there would be no direct or indirect transboundary impacts to US topography and geology.

4.2.10 Cumulative Effects

As discussed in Section 4.1.10, the cumulative condition considers existing and proposed wastewater services in Rosarito and the Tijuana River watershed and coastal regions as well as general economic development in Rosarito.

There are several wastewater infrastructure projects being considered or implemented in Rosarito and Tijuana. First, four new wastewater treatment plants are being constructed in the Tijuana watershed and coastal areas, referred to as the Japanese Credit Bank plants. These plants will provide much needed additional treatment capability and will improve the quality of wastewater discharges. The Tecolote La Gloria plant is planned for the coastal Tijuana region and would discharge effluent into the Pacific Ocean. Operation of this plant would reduce raw wastewater discharges into the Pacific Ocean and improve the overall water quality of Mexico's coastal waters. This could indirectly improve US coastal waters. The remaining three Japanese Credit Bank plants in the Tijuana watershed area may discharge into the Tijuana River and their effluent might reach the Pacific Ocean via the Tijuana River Estuary. If these discharges should reach the Pacific Ocean, there could be negative cumulative effects to coastal water quality and ocean beaches. The Public Law 106-457 WWTP is proposed to discharge additional secondary effluent into the Pacific Ocean through the SBOO. The Potable Water and Wastewater Master Plan for Tijuana and Playas de Rosarito (CDM 2003) determined that average outflows up to 63 mgd and peak flows up to 95 mgd through the SBOO would not have impacts to ocean water resources (CDM 2003).

General economic development in the Rosarito region could improve the US border economy by improving existing and creating new trade relationships. Additionally, improvements in the Rosarito region could attract more US residents to the area, which would improve economic activity in the border area.

The proposed action would further decrease raw wastewater discharges in the Pacific Ocean. This would be a cumulative beneficial impact to coastal waters of Mexico. Under the cumulative condition, the proposed action would have indirect benefits to US coastal waters and biological resources by improving ocean water quality through reductions of raw wastewater discharges. The proposed action would increase treated effluent discharges into the Pacific Ocean from the Rosarito and Rosarito Norte WWTPs. These discharges could reach US coastal waters; however, considering the distance to the border, natural attenuation and dilution, and the effects on the US water quality of other less distant sources, the potential incremental impact of the additional effluent discharges from Rosarito would not be cumulatively significant.

The proposed action would also improve public health in Rosarito, which could further attract visitors to the region and increase economic activity. This would also be a cumulative indirect benefit to US public health and socioeconomics.

4.3 Potential Impacts of Wastewater Conveyance Alignment Alternative B (Preferred Alternative)

This section describes potential direct and indirect transboundary environmental impacts on US resources of Alternative B and potential cumulative effects. The only substantial difference between the two action alternatives is the alignment of some of the new sewer lines, resulting in some additional construction for the alignments in Alternative A. Alternative B has been identified as the Preferred Alternative. Table 4-3 presents a summary of the transboundary environmental impacts resulting from Alternative B. Given that no adverse impacts are anticipated, mitigation measures are not necessary.

Table 4-3
Summary of Impacts to the United States
Resulting from the Wastewater Conveyance Alignment
Alternative B

Air Resources	No Impact
Water Resources	Beneficial Impact
Floodplains	No Impact
Wetlands	No Impact
Biological Resources	Beneficial Impact
Cultural Resources	No Impact
Coastal Resources	No Impact
Socioeconomics and Public Health	Beneficial Impact
Topography and Geology	No Impact
Cumulative Impacts	No Impact

4.3.1 Air Resources

Construction activities could have direct effects to air resources in and around the area of construction. The proposed wastewater infrastructure in Alternative B would generate noise, dust, and construction equipment exhaust during the construction phase. These emissions would be terminated after construction is complete.

Site preparation and construction activities would result in the emission of sulfur oxides, nitrogen oxides, hydrocarbons, carbon monoxide, and particulate matter from equipment exhaust, and particulate matter from fugitive dust. These emissions would be generated from earthwork activities (i.e. grading, trenching/excavation, filling, etc.) and from major hauling operations, if necessary, to remove excavated material or to bring in supplies. Of particular potential concern would be nitrogen oxide emissions, which are a precursor to ozone and are associated with diesel engine exhaust.

Alternative B may have a direct adverse impact on air resources in localized construction areas in Rosarito if construction management practices are not implemented.

Air resources in the US would not be directly or indirectly affected by the proposed action. The San Diego Air Basin is in nonattainment status for State ambient air quality standards for ozone and PM emissions. Construction of the proposed project would take place approximately 30 kilometers (18.8 miles) south of the US-Mexico border, and noise, dust, and exhaust emissions would not be perceived in the US. Construction activities are temporary and the associated emissions would tend to disperse towards the southeast, away from the US, based on the prevailing wind patterns of the area.

The construction activities associated with these alternatives are not in close enough proximity for noise levels to exceed US standards. Based on construction equipment mix and activity level associated with construction of general wastewater infrastructure, construction activity noise levels at 50 feet would be approximately 84 dBA for site clearing, 87 dBA for excavation, 83 dBA for construction, and 82 dBA for finishing (City of San Diego Metropolitan Wastewater Department,1996). Based on standard noise drop-off rate of 6 dBA per doubling of distance, the highest noise level (87 dBA for excavation activities) would naturally attenuate to 75 dBA – the level recognized by the City of San Diego's Noise Ordinance as the maximum acceptable level for construction noise in residential areas – at a distance of 200 feet. This noise level would fall well within Mexico boundaries and would not violate US noise standards. There would not be a noise impact to the US.

During the operational phase, Alternative B would result in a reduction of odors arising from the inadequate disposal of raw wastewater. This alternative would be beneficial to the residents of unserved areas during the operational phase. However, the improvement in odors in the US would be negligible due the substantial distance of the projects.

4.3.2 Water Resources

Alternative B would prevent the discharge of raw wastewater to nearby latrines and open ditches, which could affect local groundwater and ultimately the Pacific Ocean. It is estimated that 60.7 L/s (1.39 mgd) of untreated wastewater would be appropriately collected and treated by this action alternative, thus improving water

quality in surface water streams and the ocean in the Playas de Rosarito area. This would be a direct benefit to water resources in the Rosarito area.

This alternative could indirectly benefit coastal waters of the US in the instance that currents move water with improved quality north from Rosarito to the US. However, this potential beneficial impact would not be significantly perceived in the US given typical current patterns in the region, the distance of the effluent discharge points relative to the US, and the natural dilution of effluent that would occur before any effluent may reach the US.

4.3.3 Floodplains

Floodplains would not be directly or indirectly affected under Alternative B because construction would not take place in the US. No transboundary impacts would result from this alternative.

4.3.4 Wetlands

Wetlands in the US would not be affected by Alternative B due to its substantial distance from the project area. Any indirect benefits as a result of improved water quality of coastal waters would not reach US wetlands. Therefore, Alternative B would not result in any transboundary impacts to US wetlands.

4.3.5 Biological Resources

Alternative B includes the construction of sewer lines along existing streets in previously disturbed areas. Construction activities would not have any direct effect on habitat and biological resources in Playas de Rosarito, and as such, there will not be adverse impacts to biological resources in the US. Because construction is not proposed in the US, there would not be any direct impacts to biological resources in the US from construction activities. A potential indirect impact on US biological resources relates to migratory species that may travel between areas in Playas de Rosarito and the US. This potential impact would be unlikely because construction will take place in previously disturbed areas that offer little habitat value.

Conditions for biological resources along surface streams in Rosarito where untreated wastewater is currently flowing would be improved, as well as for aquatic life in the ocean near the current discharge points for untreated waste water. This could result in indirect benefits to biological resources in the coastal waters of the US. However, the proposed action would be 30 kilometers south from the US-Mexico border; therefore, potential indirect beneficial impacts that may be observed in the aquatic biological resources in the US would be marginal.

4.3.6 Cultural Resources

Because construction is not proposed in the US and because of the significant distance south of the border, there would not be any direct or indirect impacts to US cultural resources. Construction activities in Mexico would occur in developed areas and would not likely affect Mexico's cultural resources.

4.3.7 Coastal Resources

Because construction is not proposed in the US and because of the significant distance south of the border, there would not be any direct or indirect impacts to areas within the coastal zone boundary associated with Alternative B.

4.3.8 Socioeconomics and Public Health

Alternative B eliminates the discharge of raw wastewater to nearby latrines and open ditches, reducing the potential contamination of localized water distribution lines through infiltration and inflow. The alternative also reduces the potential contamination of local water bodies, including the Pacific Ocean, and groundwater resources. This alternative would have direct and indirect benefits to the region's economy and public health conditions.

Public health in Playas de Rosarito would be positively affected by the proposed action because it would reduce exposure to raw sewage in open ditches and contamination of potable water supplies, which are both pertinent health risks. The improvement of sanitary conditions within the Playas de Rosarito vicinity would promote better overall public health conditions in the area. The region's economy could improve because workers in Rosarito are healthier, which could lead to more productivity, and the region could attract more tourism because potential health threats to visitors would be reduced.

The proposed action could result in indirect transboundary benefits to US public health and the border economy. There are frequent border crossing between the US and the Tijuana-Playas de Rosarito region. Public health in the US could improve because US visitors to Rosarito would not be exposed to raw sewage from the unserved areas. The border economy could also indirectly benefit as a result of better overall health conditions in Rosarito. The potential health threat associated with traveling to Rosarito would be reduced and more US residents may choose to cross the border. This could increase economic activity in the border region of the US.

Environmental justice populations, including low-income populations and minorities, in the US would not be affected by the proposed project. The decision to be made on the proposed project is how to provide wastewater service to currently unserved communities in Playas de Rosarito, and thus will not affect water and wastewater services for populations in the US.

4.3.9 Topography and Geology

Because construction is not proposed in the US, there would not be any direct or indirect impacts to topography and geology.

4.3.10 Cumulative Effects

As discussed in Section 4.1.10, the cumulative condition considers existing and proposed wastewater services in Rosarito and the Tijuana River watershed and coastal regions as well as general economic development in Rosarito.

There are several wastewater infrastructure projects being considered or implemented in Rosarito and Tijuana. First, four new wastewater treatment plants are being constructed in the Tijuana watershed and coastal areas, referred to as the Japanese Credit Bank plants. These plants will provide much needed additional treatment capability and will improve the quality of wastewater discharges. The Tecolote La Gloria plant is planned for the coastal Tijuana region and would discharge effluent into the Pacific Ocean. Operation of this plant would reduce raw wastewater discharges into the Pacific Ocean and improve the overall water quality of Mexico's coastal waters. This could indirectly improve US coastal waters. The remaining three Japanese Credit Bank plants in the Tijuana watershed area may discharge into the Tijuana River and, should the effluent reach the Pacific Ocean via the Tijuana River Estuary, there could be negative cumulative effects to coastal water quality and ocean beaches. The Public Law 106-457 WWTP is proposed to discharge additional secondary effluent into the Pacific Ocean through the SBOO. The Potable Water and Wastewater Master Plan for Tijuana and Playas de Rosarito (CDM 2003) determined that average outflows up to 63 mgd and peak flows up to 95 mgd through the SBOO would not have impacts to ocean water resources (CDM 2003).

General economic development in the Rosarito region could improve the US border economy by improving existing and creating new trade relationships. Additionally, improvements in the Rosarito region could attract more US residents to the area, which would improve economic activity in the border area.

The proposed action would further decrease raw wastewater discharges in the Pacific Ocean. This would be a cumulative beneficial impact to coastal waters of Mexico. Under the cumulative condition, the proposed action would have indirect benefits to US coastal waters and biological resources by improving ocean water quality through reductions of raw wastewater discharges. The proposed action would increase treated effluent discharges into the Pacific Ocean from the Rosarito and Rosarito Norte WWTPs. These discharges could reach US coastal waters; however, considering the distance to the border, natural attenuation and dilution, and the effects on the US water quality of other less distant sources, the potential incremental impact of the additional effluent discharges from Rosarito would not be cumulatively significant.

The proposed action would also improve public health in Rosarito, which could further attract visitors to the region and increase economic activity. This would also be a cumulative indirect benefit to US public health and socioeconomics.

Section 5
List of Acronyms

ACHP	Advisory Council on Historic Preservation
AHPA	Archeological and Historic Preservation Act
ALK	Alkalinity
BECC	Border Environment Cooperation Commission
BEIF	Border Environment Infrastructure Fund
Ca	Calcium
CAA	Clean Air Act
CARB	California Air Resources Board
CDM	Camp Dresser & McKee Inc.
CEQ	Council on Environmental Quality
CESPT	Commisión Estatal de Servicios Públicos de Tijuana
CFU	Colony Forming Units
CFR	Code of Federal Regulations
CFU	colony forming units
Cl	Chloride
CO	Carbon monoxide
CWA	Clean Water Act
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act
dB	decibels
dB Leq	decibels equivalent sound level
dBA	decibels A-weighted
DFG	Department of Fish and Game
DO	Dissolved Oxygen
EA	Environmental Assessment
EID	Environmental Information Document
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
Fe	Iron
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FNSI	Finding of No Significant Impact
FWCA	Fish and Wildlife Coordination Act
H^+	Ions in solution
H^2S	Hydrogen Sulfide
HC	Hydrocarbons
Hr	hour

IBC	International Boundary Commission
IBWC	International Boundary and Water Commission
IBEP	Integrated Border Environmental Plan
in	inches
INEGI	Instituto Nacional de Estadística Geographía e Informática
K	Potasium
km	Kilometer
L	Liter
L/s	Liters per Second
m	Meters
Mg	Magnisium
m^3	Cubic meters
MBTA	Migratory Bird Treaty Act
mgd	Million gallons per day
mg/l	Milligrams per liter
MIA	Manifestación de Impacto Ambiental
ml/l	Milliliters per liter
ml	Milliliters
Mm^{-1}	Inverse megameters
MSCP	Multiple Species Conservation Program
MWWD	Metropolitan Wastewater Department
Na	Sodium
NAAQS	National Ambient Air Quality Standards
NADB	North American Development Bank
NAFTA	North American Free Trade Agreement
NERR	National Estuarine Research Reserve
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_2	Nitrogen Dioxide
NOM	Norma Oficial Mexicana
NPS	National Park Service
O_3	Ozone
pH	Measure of acidity
Pb	Lead
PM_{10}	Particulate matter under 10 microns
ppm	Parts per million
SBIWTP	International Water Treatment Plant
SBOO	South Bay Ocean Outfall
SDAB	San Diego Air Basin
SDSU	San Diego State University
SHPO	State Historic Preservation Officer
SO_2	Sulfur dioxide

SO_4	Sulfate
Sr	Strontium
TDS	Total Dissolved Solids
$\mu g/m^3$	Micrograms per cubic meter
US	United States
USC	United States Code
USDOE	United States Department of Energy
USFWS	US Fish and Wildlife Service
USIBWC	United States International Boundary and Water Commission
XMS	Transmissivity
WA	Wilderness Act
WTP	Water Treatment Plant
WWTPs	Wastewater Treatment Plants

Section 6
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Section 7
List of Agencies Consulted

The following agencies were contacted by letter. Comments received are summarized in the following table.

Agency	Agency Contact	Summary of Comments
USFWS	Steve Thompson USFWS	No Comments Provided
National Park Service	Pacific West Information Center San Francisco, CA	No Comments Provided
Natural Resources Conservation Service	Lincoln E. "Ed" Burton USDA Lyng Service Center	No Comments Provided
CA Department of Fish and Game	Mr. Banky Curtis Habitat Conservation Division	No Comments Provided
Regional Water Quality Control Board	Mr. David Barker San Diego Regional Water Quality Control Board	No Comments Provided
California Air Resources Board	California Air Resources Board Headquarters Building Sacramento, CA	No Comments Provided
California Office of Historic Preservation	California Office of Historic Preservation Sacramento, CA	No Comments Provided
California Coastal Commission	California Coastal Commission San Francisco, CA	No Comments Provided
San Diego County	Mr. Mark McPherson San Diego County Land and Water Quality Management Division	No Comments Provided
IBWC	Gilbert Anaya International Boundary and Water Commission United States Section	No Comments Provided
Comisión Internacional de Limites y Aguas	Carlos Peña, Jr. Acting Division Engineer	The development of the projects would help protect and improve conditions along the coast.

Appendix A

Description of Alternatives A & B Pipe Alignments

Appendix A
Description of Alternatives A & B
Pipe Alignments

The following figures (A-1 through A-6) present the alternative alignments A and B. In all figures, Alternative A is presented in green lines and Alternative B, the preferred alternative, is presented with red lines.

Figure A-1 presents the alternatives for Poblado Morelos. The project includes collectors east and west of a pump station, and the alternative alignments were developed for the lines west of the pump station. Alternative A consists of a collector connecting to the existing system in the area of Colinas de Rosarito. Alternative B would have a collector from the pump station to a connection point in the area of Ejido Mazatlán.

Figure A-2 presents the alternatives for La Mina, which follow very similar alignments and would require approximately the same construction.

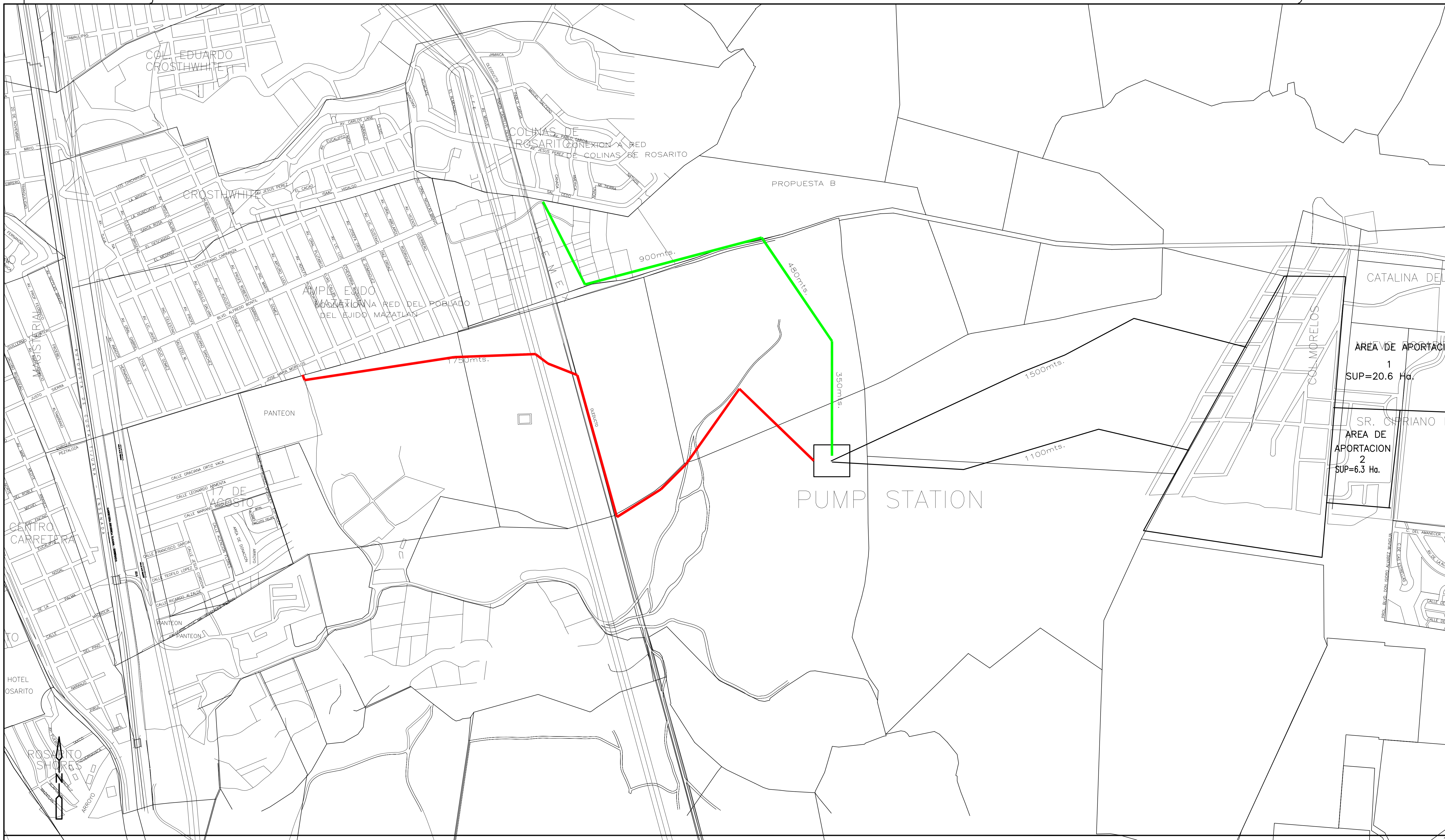
Figure A-3 presents the alternatives for the project in Santa Lucia. In this case, Alternative A would include two small pump stations and an interceptor running east to west along Blvd. Los Cunados, separating Santa Lucia (north) from Lomas de Rosarito (south). This interceptor would connect to a new collector along Blvd. Miguel Hidalgo that connects to the existing Collector La Gloria. Alternative B would consist of two new collectors that would connect the flow from Santa Lucia to the existing system downstream of it in Lomas de Rosarito. The systems would be connected at Calle Mina El Morro and Calle Mina El Triunfo. Thus, instead of intercepting the flow at Blvd. Los Cunados and not allowing the wastewater from Santa Lucia to enter the Lomas de Rosarito system (which happens in Alternative A), Alternative B would use the existing Lomas de Rosarito system to convey the flow from Santa Lucia further downstream.

Figure A-4 presents the alternatives for the project in Colinas de Monte Carlo. Alternatives A and B are similar to the Santa Lucia Alternatives. Alternative A intercept flows from Colinas de Monte Carlo and takes them to a connection to La Gloria-Rosarito collector (existing), while Alternative B would establish a connection between the Colinas de Monte Carlo and Santa Lucia systems, with the construction of several small collectors that connect to existing manholes along Avenida Independencia. These collectors are shown in red in Figure A-4, and the direction of flow is indicated in red too (from Colinas de Monte Carlo to Santa Lucia).

Figure A-5 presents the alternatives for the project in Campestre Lagos. Alternatives A and B are similar to the Santa Lucia and Colinas de Montecarlo Alternatives. Alternative A would provide a pump station and a line to connect all flow from Campestre Lagos to the La Gloria-Rosarito collector (existing), while Alternative B

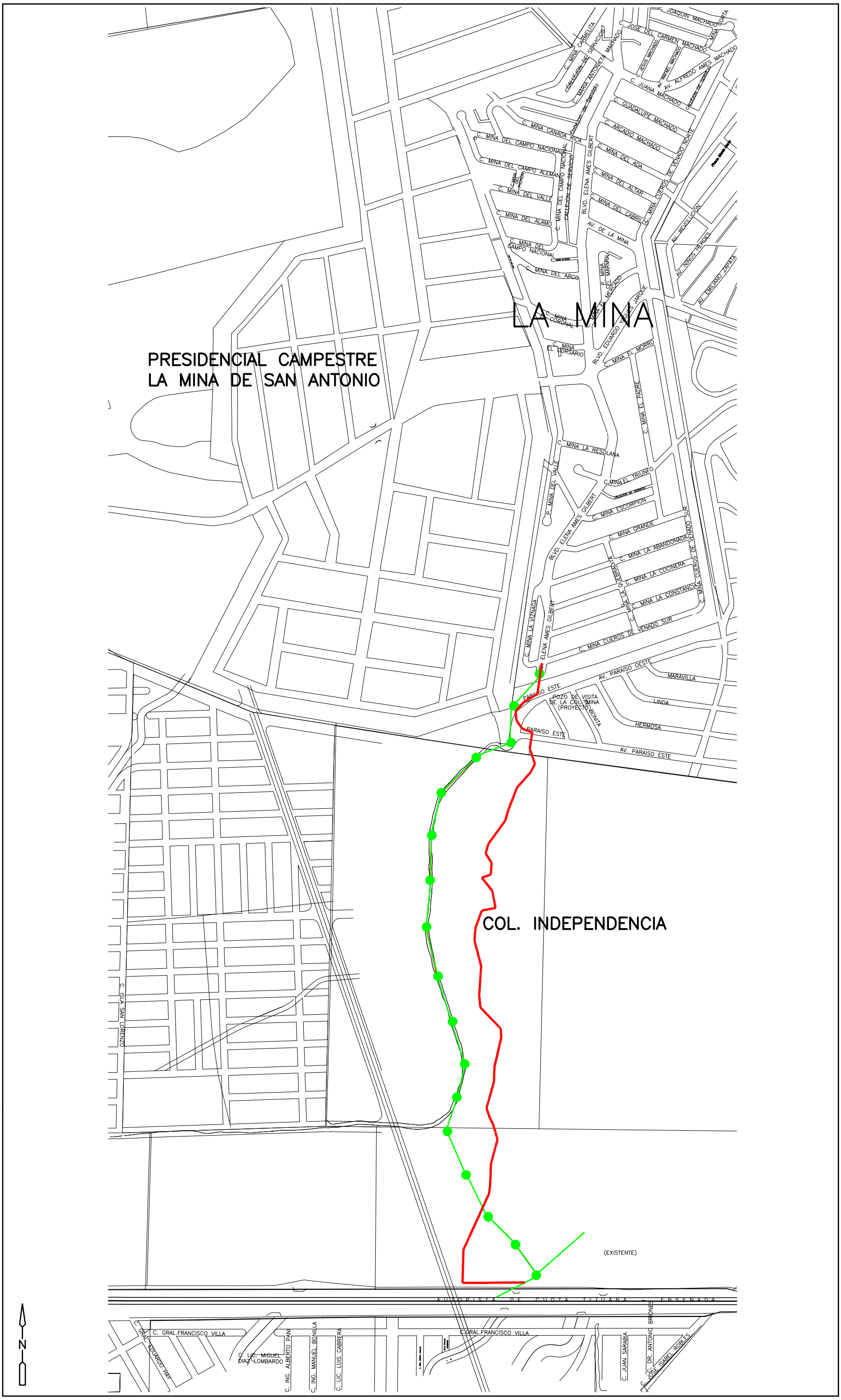
would provide two collectors connecting the flows from Campestre Lagos to two connection points along the La Gloria-Rosarito collector.

Figure A-6 presents the alternatives for the project in Colinas de Rosarito. Both alternatives collect flow from two different parts of the Colinas de Rosarito area in Calle Ensenada and Av. Vicente Guerrero. Alternative B would simply connect the flow collected in these two locations to the existing system immediately downstream in Colonia Crosthwhite and Ampliación Ejido Mazatlán (respectively). The red lines in Figure A-6 show the collectors required to accomplish this and the end point as an arrow indicates the direction of flow. Alternative A would require long collectors that would convey the flow from the two collection points to a manhole in Colonia San Fernando.



LEGEND
Alternative A
Alternative B

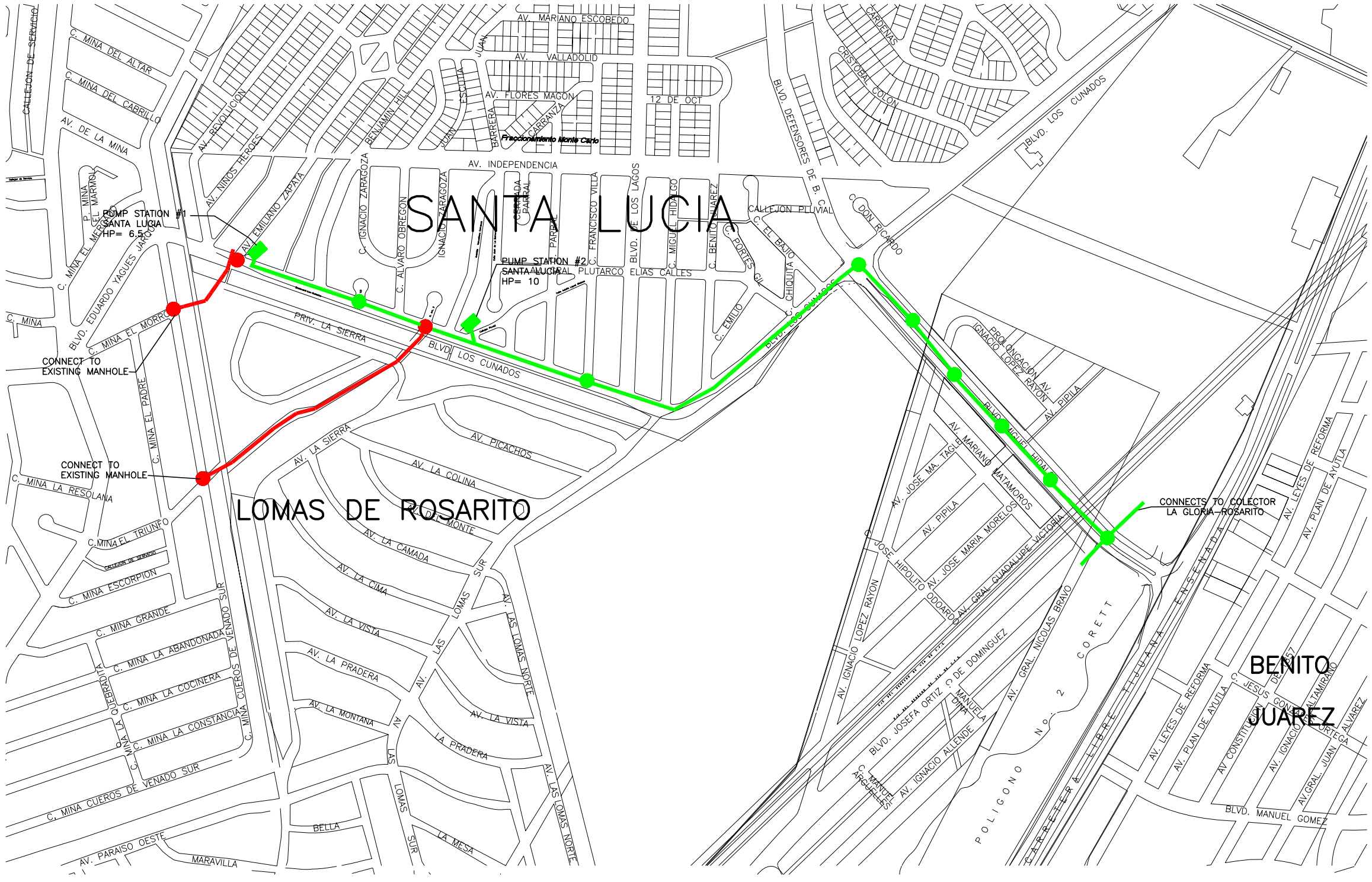
Figure A–1
Poblado Morelos Wastewater Collection System Alternatives



LEGEND

Alternative A
Alternative B

Figure A–2
Fraccionamiento La Mina Wastewater
Collection System Alternatives



LEGEND

Alternative A
Alternative B

Figure A–3
Santa Lucia Wastewater Collection System Alternatives

LOMAS DE MONTECARLO

LA MINA

SANTA LUCIA

LOMAS DE ROSARITO

PUMP STATION #1
MONTECARLO
HP=5

PUMP STATION #2
MONTECARLO
HP= 5

4" FORCE MAIN
MONTECARLO #1

4" FORCE MAIN
MONTECARLO #2

CONNECTS TO
LA GLORIA–ROSARITO COLLECTOR
(EXISTENTE)

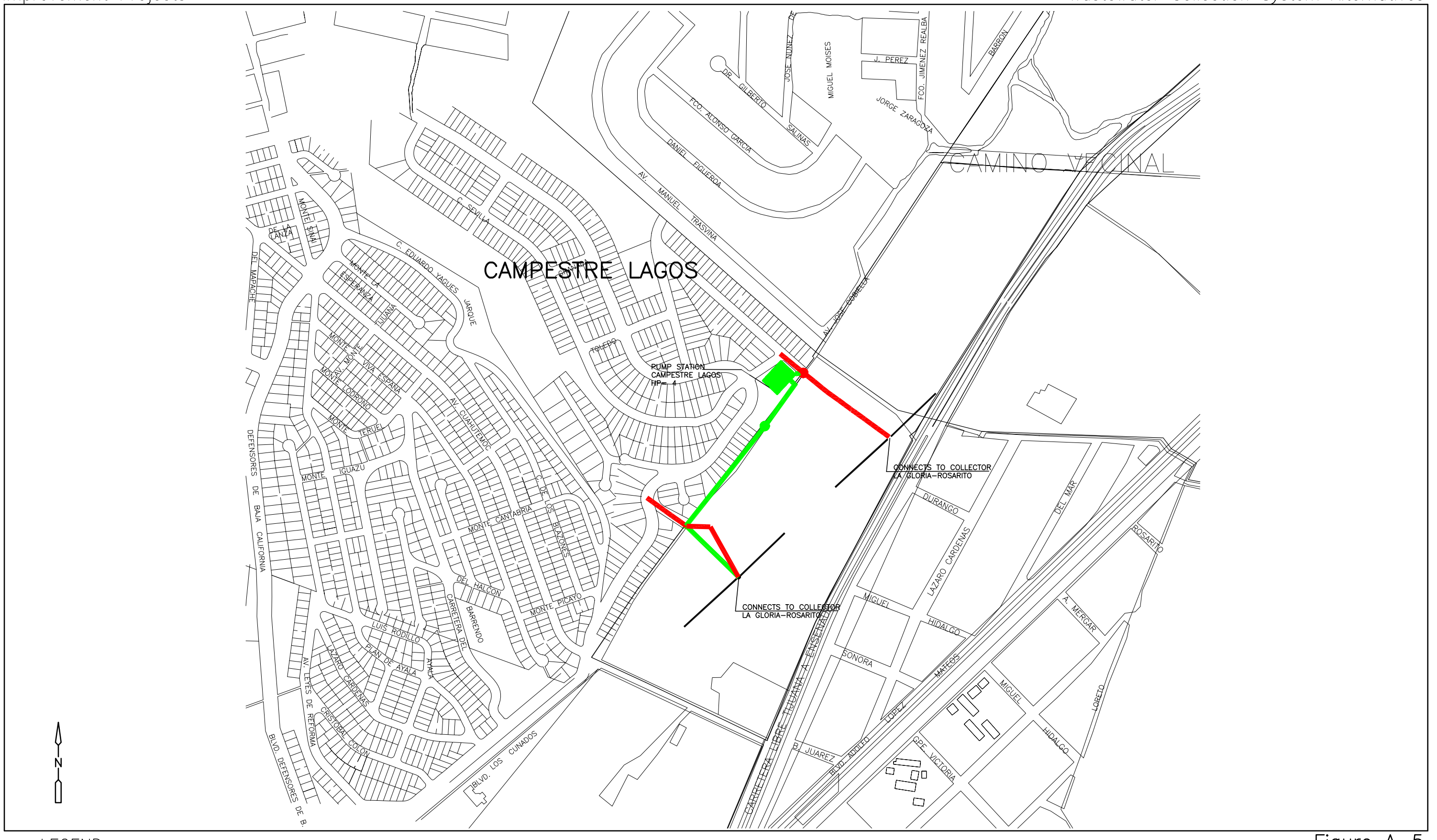
Fraccionamiento Monte Carlo

Fraccionamiento Lomas de Rosarito

LEGEND

Alternative A
Alternative B — Connects to Lomas de Rosarito System (downstream)

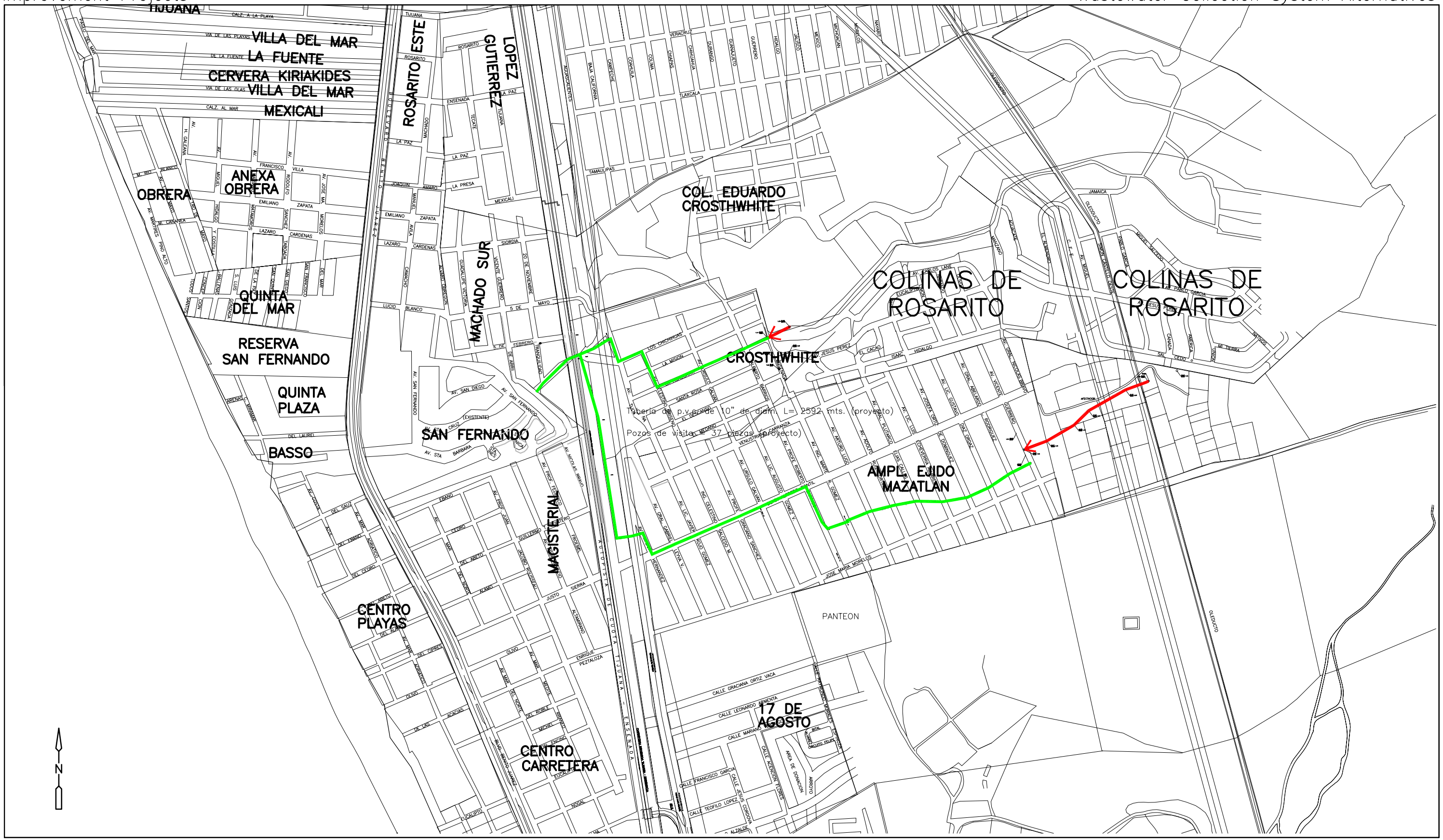
Figure A–4
Colinas de Montecarlo Wastewater Collection System Alternatives



LEGEND

Alternative A
Alternative B

Figure A–5
Fraccionamiento Campestre Lagos Wastewater Collection System Alternatives



LEGEND

Alternative A
Alternative B — Connects to Ejido Mazatlan System (downstream)

Figure A–6
Colinas de Rosarito Wastewater Collection System Alternatives