Environmental Assessment

Tijuana River Diversion Rehabilitation
Tijuana, Mexico

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1.0 INTRODUCTION

The United States Environmental Protection Agency (EPA) administers the Border Environment Infrastructure Fund (BEIF), which provides grant funding for water and wastewater infrastructure projects located along the international boundary between the United States (U.S.) and Mexico. EPA policy for use of border funds requires evaluation and certification of projects by the North American Development Bank (NADB) as a condition for grant award. As part of the NADB certification process, the proposed project must comply with (1) Mexican environmental regulations and (2) the National Environmental Policy Act (NEPA). The EPA requires compliance with NEPA before BEIF funds can be authorized. Projects within 62 miles (mi) (100 kilometers [km]) of the U.S./Mexico border are eligible for BEIF assistance.

In accordance with the U.S. Council of Environmental Quality (CEQ) regulations, 40 CFR Parts 1500-1508, and EPA regulations (40 CFR Part 6) as guidance, this Environmental Assessment (EA) documents the environmental consequences in the US of the proposed federal action. The purpose of this document is to comply with NEPA documentation requirements for the proposed federal action under consideration, which consists of rehabilitation of PBCILA, PB1A, and PB1B lift stations, part of the Tijuana River diversion system as well as the construction of a new Tijuana River intake.

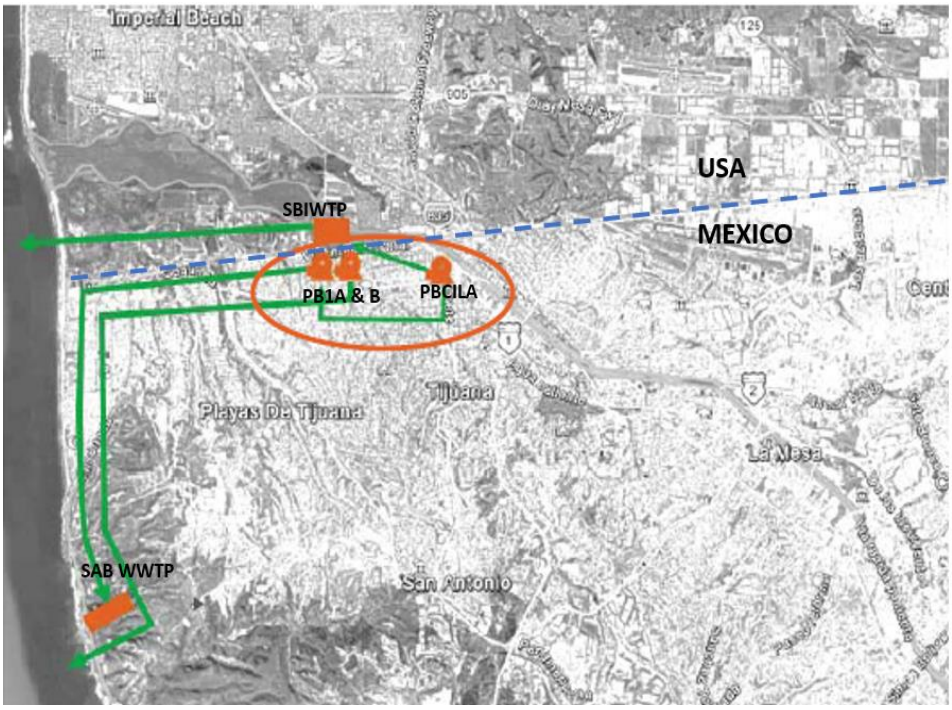
1.1 STUDY LOCATION

The proposed project is located in the City of Tijuana, in the state of Baja California in northwestern Mexico. The City of Tijuana is within the larger municipality of Tijuana, which has a population of 1,922,523 people (INEGI, 2020), an area of approximately 538 square miles (1,393 square kilometers), and contains the municipal delegations of San Antonio de los Buenos, Playas de Tijuana, Centro, Sánchez Taboada, La Mesa de Tijuana, Cerro Colorado, La Presa, Centenario, and Mesa de Otay.

The City of San Diego is the U.S. city located directly north of Tijuana. San Ysidro is a community within the City of San Diego located directly on the U.S./Mexico border across from Tijuana. The City of Tijuana is connected to the San Ysidro district of southern San Diego in the United States by the San Ysidro and Otay Mesa Border Crossing Stations. The San Ysidro border crossing is the busiest land-border crossing in the world, with over 50 million people using the crossing each year.

The area of concern for this EA is relatively flat in the U.S. and hilly in Mexico, generally ranging from sea level to about 800 feet (245 meters) above mean sea level (amsl) in elevation. The low-lying parts of the City of Tijuana have an elevation of about 65 feet (20 meters) amsl. The project area is in the vicinity of the Tijuana River, which originates in the Sierra de Juárez Mountain Range. The 120-mile (193 kilometer) river flows north through Mexico and into the United States before draining into the Pacific Ocean.

Figure 1.1 Lift stations sites



1.2 PURPOSE AND NEED

The purpose of the proposed action is to improve the wastewater diversion system in Tijuana. This project will result in mitigation of transboundary wastewater flows entering the United States and improvement in sanitary conditions within the City of Tijuana. A 2017 Comprehensive Wastewater Treatment and Reuse Plan prepared by the Comisión Estatal de Servicios Públicos de Tijuana (CESPT) found numerous areas of the wastewater system in need of improvement and affected by significant deterioration, facing imminent failure. In coordination with the International Boundary and Water Commission (IBWC) and its Mexican counterpart Comisión Internacional de Límites y Agua (CILA), the current diversion system in Tijuana has been in operation for nearly 30 years.

Rehabilitation measures and construction of additional infrastructure will reduce the risk of lift station failures that may result in untreated or inadequately treated wastewater discharges totaling approximately 1,500 liters per second (l/s) or 34.2 million gallons per day (mgd) (NADB, 2021). If these discharges reach the Tijuana River and flow north into the United States, beaches in San Diego, Imperial Beach, Coronado, and other coastal cities will become contaminated. In many cases local governments are forced to close them through much of the year due to public health concerns. Mexican beaches face a similar scenario when discharges flow west towards Playas de Tijuana and Rosarito, Baja California, Mexico.

Due to frequent contaminated discharges crossing into the United States, the Tijuana River Estuary has been listed as an "impaired" water body under Section 303(d) of the Clean Water Act (Tijuana River Diversion Study, 2019). In response to an increase in transboundary flow events, on February 2020 the San Diego Regional Water Quality Control Board issued an investigative order

to IBWC requiring them to "submit technical reports pertaining to the investigation of pollution, contamination, and nuisance from transboundary flows in the Tijuana River Valley. The purpose of the required comprehensive technical and investigative monitoring reports is to identify the extent, magnitude, durations, trends, and risks associated with pathogens, toxic pollutants, and trash that are discharged through infrastructure owned, operated, and controlled by the U.S. Section of the IBWC" (CA Water Board, 2021). Environmental impacts to the estuary have been a central focus of concern, in part because several endangered bird species call it home. Some of them include the Western snowy plover, California least tern, and the Light-footed clapper rail.

Tijuana River flows will carry a variety of contaminants all the way to the Pacific Ocean, including, but not limited to, fecal coliform, ammonia, phosphorus, DEHP (a chemical found in plastics), and various metals from industrial origins. Direct contact with contaminated water may cause illnesses in humans. According to a study conducted by SCRIPPS Institution of Oceanography, the top risk to swimmers is norovirus, causing gastrointestinal issues. Furthermore, their study revealed that approximately 4% of those coming into contact with contaminated water at beaches will likely become ill. Facing evident public health issues, in early 2021 San Diego County declared the sewage-tainted water a public health crisis for the first time (KPBS, 2021).

Contaminated beaches not only cause environmental and public health problems, but their closure also affects the economy of local cities that depend heavily on tourism in the area. In Coronado, CA, tourism provides tax dollars that represent over 35% of the city's general fund's revenue which fully provides for fire, police, and beach services (Coronado Chamber of Commerce, 2018). Concerns over prominent media articles showcasing a "Keep Out - Sewage Contaminated Water" sign in front of the Hotel Del Coronado alarmed businesses and the local government, prompting officials to demand an urgent call for action.

Tijuana's collection and diversion system requires the rehabilitation of its pumping plants and intake expansion in order to operate per its intended purpose. The environment, public health, and economy of the affected areas depend on its reliability and will continue to face negative impacts under the diversion system's current deteriorating status.

1.3 SCOPE OF ANALYSIS

The scope of this EA includes the evaluation of the impact to the relevant environmental resources within the defined area of concern in the U.S. As defined in the CEQ regulations (§1508.25), the scope consists of the range of actions, alternatives, and impacts to be considered in a NEPA-compliant document.

2.0 PROJECT DESCRIPTION AND ALTERNATIVES

In accordance with Council on Environmental Quality (CEQ) regulations (§1502.14), this section of the EA: 1) presents and objectively evaluates the alternatives, including the No Action alternative; 2) devotes substantial treatment to each alternative considered in detail so the reviewers may evaluate comparative merits; and 3) includes appropriate mitigation measures. Based on the information and analysis presented in Section 3.0 (Affected Environment) and Section 4.0 (Environmental Consequences), this section also presents the potential environmental impacts of the alternatives in comparative form, which defines the issues and provides a clear basis for choice among options by decision makers and the public.

2.1 PROPOSED ACTION

The proposed action would rehabilitate lift stations PBCILA, PB1A and PB1B, and incorporate the construction of a new, expanded Tijuana River intake of approximately 289 ft (88 meters) with a 48-in fiberglass reinforced (FRP) pipe.

PBCILA pump station is designed to divert up to 23 mgd of river water during dry weather to prevent flows from reaching the United States. An upgrade would allow it to divert up to 35 mgd. Diverted flows are directed to PB1A or into the International Collector. Components of the PBCILA improvements include the following: sand and grit removal (Vortex), fine and coarse mechanized screen, two flow meters, conveyor belts for automatic trans and debris collection, a new 125 HP chopper pump, 300 kVA transformer replacement, and perimeter wall protection.

Pump Station 1A is a sanitary sewer lift station that receives flow from PBCILA and pumps it south to San Antonio de los Buenos Wastewater Treatment Plant (SAB WWTP) and SAB Creek via the parallel conveyance. It has a pumping capacity of approximately 10 mgd (EID, 2021). Pump Station PB1B is also a sanitary sewer lift station that receives flow from the International Collector and has two parallel pump trains, each with a dual set of pumps in series (EID, 2021). The pump's capacity is 23 mgd, and its flows are transported toward SAB WWTP and SAB Creek via the parallel conveyance. Flows from PB1B arriving at SAB Creek are transported via one of two 10-mile pipelines over a 100-meter grade. River flows arriving at SAB WWTP bypass treatment and are discharged into the ocean.

Components of PB1A and PB1B improvements include the following: sand and grit removal (Vortex), fine and coarse mechanized screens, building improvements, wet wells, new crane and perimeter wall protection, motor control center, four new pumping trains, Scada System, and flow meter devices. Recently, CESPT has also installed three new pumps that brought the average capacity at PBCILA to 34 mgd. Given ongoing power outages at PB1 due to inadequacies in the electric system, the proposed action includes upgrades to the electric substation. The installation of power fuses, transformers, and high-voltage cables, among other elements, will help mitigate power shutoffs at PB1. This project will improve continuity of service for the diversion system.

Altogether, the proposed action alternative would optimize the existing pump stations by upgrading their outdated components and introducing advanced technology. When the diversion system is working properly, all dry-weather flow (below 23 mgd) in the Tijuana River is diverted before transboundary flows occur. The diverted flow is routed to Pump Station 1A (PB1-A) or into

the International Collector (EID, 2021). The proposed action will ensure proper function of the diversion system and thus increase capture of dry-weather flow that currently enters the United States.

2.2 EXISTING INFRASTRUCTURE

CESPT, Tijuana's water utility, operates the water and wastewater systems for Tijuana and Playas de Rosarito, except for PBCILA which, as of September 2020, is operated by CILA. Within the Tijuana municipality, there are over 530,000 connections to the sewer collection system, extending the wastewater collection coverage to 90 percent (CESPT, 2019). CESPT operates the diversion system under an operations and communication protocol established in coordination with IBWC/CILA. Under this agreement several processes are defined, such as manual cleanup and monitoring procedures, a data log for flow volume and pump operations, and communication procedures for service interruption and re-initiation of operations.

Near the project area, wastewater from the collection system flows by gravity to two large collector lines that run parallel to the Tijuana River, one on each side. The *Poniente* (West) Collector conducts wastewater from the western side of the Tijuana River and the *Oriente* (East) Collector conducts wastewater from the eastern side of the River. Both the *Oriente* and *Poniente* collectors empty to the International Collector, which brings the wastewater to treatment facilities.

Four existing facilities operate to provide wastewater treatment services in Tijuana: Arturo Herrera, La Morita, South Bay International Wastewater Treatment Plant (SBIWTP), and SAB WWTP. However, SAB is currently not in operation due to lack of discharge compliance, so CESPT is undertaking a series of studies to assess potential solutions.

The SBIWTP is located in San Ysidro, California, at the U.S./Mexico border, and treats wastewater generated exclusively in Tijuana. The SBIWTP provides secondary treatment with a capacity of 25 mgd (1,100 l/s) and discharges effluent through an underwater outfall pipe (the South Bay Ocean Outfall [SBOO]) into the Pacific Ocean. The SBOO extends 3.5 miles into the ocean, has a tunnel 11 feet in diameter, and has a capacity of 175 mgd (7,623 l/s), which helps to dilute effluent entering the ocean and to reduce environmental impacts. SBIWTP discharges are subject to California water quality standards, which are specified in the National Pollution Discharge Elimination System (NPDES) permit for the plant. The SBIWTP treats an average of 25 mgd (1,100 l/s).

The La Morita WWTP, with a design capacity of 5.8 mgd (254 l/s), provides advanced secondary treatment using an oxidation ditch activated sludge treatment process, followed by filtration and UV disinfection. The WWTP is located approximately 6.5 miles (10 km) south of the border and 2.9 miles (4.7 km) east of the Arturo Herrera WWTP. The plant discharges to the Tijuana River via the Matanuco Creek.

The Arturo Herrera WWTP has a design treatment capacity of 10.5 mgd (460 l/s). This plant, also located within the Tijuana River basin, provides advanced secondary treatment similar to La Morita and has two modules of 5.25 mgd (230 l/s) each. The WWTP is located approximately 6.5 miles (10 km) south of the border. It also discharges to the Tijuana River.

Flows in the Tijuana River, which are a combination of groundwater, natural runoff, treated wastewater effluent, potable water leaks, sewer leaks and spills, are intercepted at the border before crossing into the U.S. During dry weather, flows arriving at PBCILA may be directed to the dual-pump station, PB1A and PB1B. Typically these would be pumped approximately 6 miles south to the SAB WWTP. However, with SAB WWTP currently not in operation, the flows are instead sent via one of two 10-mile pipelines over a 100-meter grade directly to an outfall that discharges to SAB Creek, which then flows a short distance to the Pacific Ocean.

While the diversion system's design capacity is 35 mgd or 1,500 l/s, PBCILA stops operating during wet weather events when river flows exceed its operational capacity of 23 mgd or 1,000 l/s. Pumps are shut down to prevent damage from grit and sand carried by stormwater. Once wet-weather flows fall back below 23 mgd, CESPT begins the process of removing debris left behind in the system in preparation to start the pumps again.

During the 2016-2017 winter season, heavy rainfall caused several sections of the pipeline to collapse, leading to an increased number of transboundary flow events and prompting the U.S. government to announce a formal complaint. As a result, CESPT was directed by the State of Baja California to develop a Comprehensive Wastewater Treatment and Reuse Plan with the following objectives: "reduce untreated wastewater discharges to the Pacific Ocean, improve the management of treated wastewater discharges to the Tijuana River basin, increase the use of treated water through groundwater replenishment, address sludge disposal, prioritize infrastructure development and establish a financial strategy" (NADB, 2021).

In the past five years, days of dry weather transboundary flows have increased dramatically through the "rainfall year," as shown on Figure 2-1. During dry weather, the following issues may trigger PBCILA pumps to be shut down: trash and sediment in the river channel, mechanical failures, deficiencies in operation and maintenance practices, power outages, and inadequate pumping capacity at PB1. In some instances, the latter may not only be caused by unexpected regional blackouts but may also be instead linked to abrupt increases in electricity costs that, together with high operation and maintenance costs, create challenges for CESPT's already limited financial resources. Since 2019, electricity costs have nearly doubled for CESPT. For example, the monthly cost of pumping water increased from $70 million pesos or $3.5 million USD, to $120 million pesos or $6.1 million USD.[1] For operations and maintenance, CESPT expects to invest approximately $100 million pesos or $5.1 million USD on PBCILA and $250 million pesos or $12.7 million USD on PB1. Still, CESPT does not anticipate increasing its water rates.

[1] "Garantiza La CESPT Agua Para El Verano ." *El Mexicano-Gran Diario Regional*, El Mexicano, 2 Feb. 2021.

Figure 2-1 Days of dry-weather flows/per rainfall year (Aug 1- Jul 31)

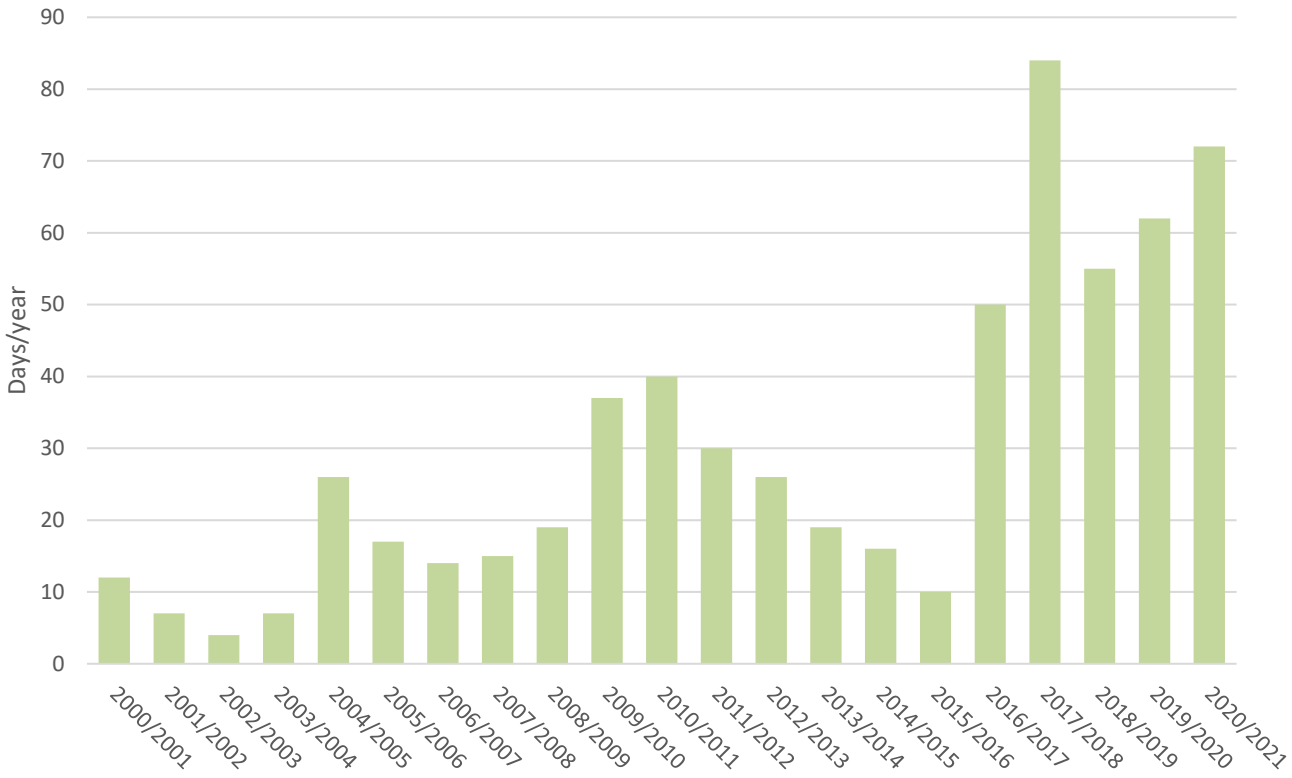


Figure 2-2 Existing system overview

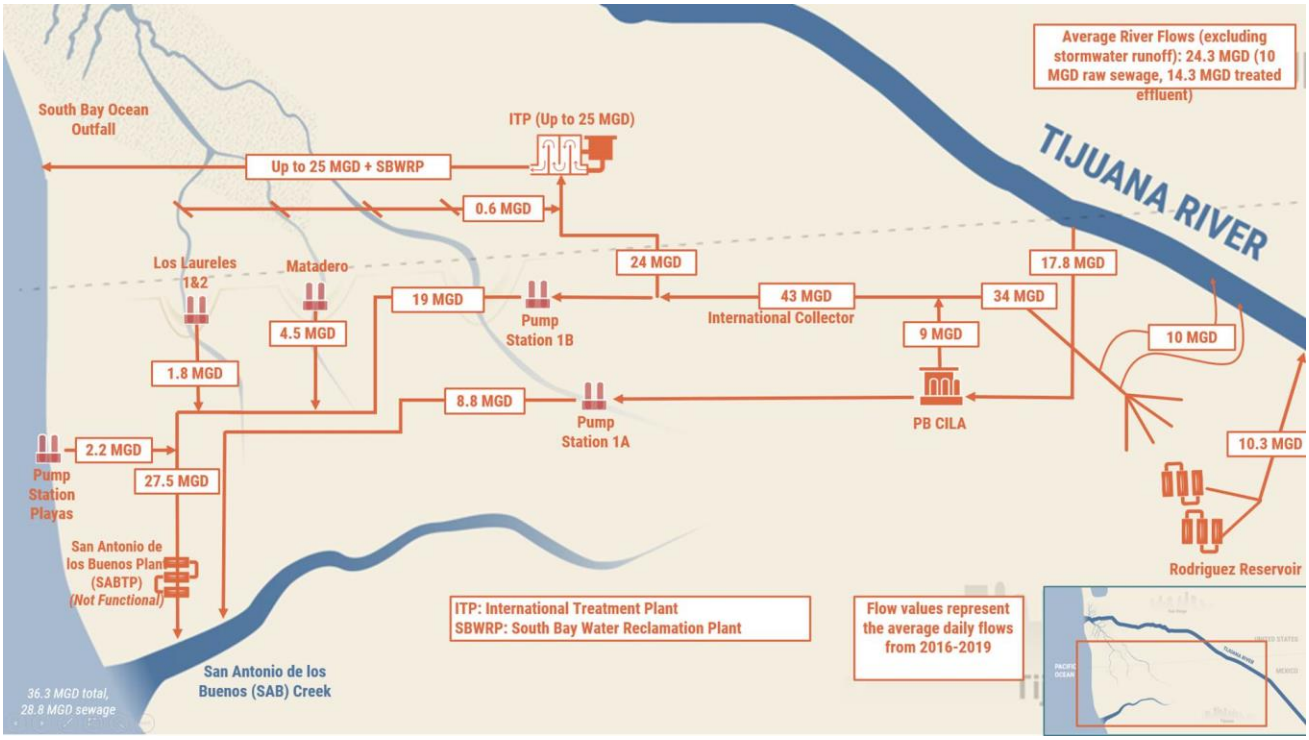


Figure 2-3 Lift stations locations near the border.

2.3 ALTERNATIVE 1 - NO ACTION ALTERNATIVE

The no action alternative is intended to be used as the baseline alternative for other alternatives to be compared. Under the no action alternative, no construction activities will take place. A new intake and its expansion would not be built and PBCILA, PB1A, and PB1B would continue to operate in their current state, which is subject to further deterioration and subsequently to malfunction.

Current conditions may lead to further deterioration of the infrastructure, which has been in operation for nearly 30 years and is past its useful life. Under a no action alternative the risk of breakdown is high. In the event of failure in the collection system, wastewater would discharge into the Tijuana River channel, cross into the United States, and flow into the Tijuana River National Estuary and San Diego region beaches, exacerbating the current conditions that jeopardize public health and the environment in the region.

2.4 ALTERNATIVE 2 – PREFERRED ALTERNATIVE

The preferred alternative, i.e. the proposed action alternative, would rehabilitate lift stations PBCILA, PB1A, and PB1B, and construct a new Tijuana River intake of approximately 289 feet (88m), otherwise known as the Tijuana River Diversion System. These actions include improvements that were identified by CESPT and NADBank to mitigate transboundary flows created by untreated wastewater discharged into the Tijuana River.

An evaluation of the critical features of the wastewater collection system led to the election of Alternative 2, the proposed action, as the preferred alternative. Alternative 2 presents the best option to not only improve sewer service to the residents of the City of Tijuana, but also to mitigate wastewater transboundary flows that continuously cross into the United States.

Lift stations PB CILA, PB1A, and PB1B are currently in urgent need of rehabilitation. Table 2-1 shows information on each lift station, including date of construction, age, number of pumps, and the pumping capacity. Lift station failures can result in untreated wastewater discharges flowing into surface streets and eventually into the Tijuana River channel. Once in the Tijuana River, flows will make their way north into the United States, contaminating the Tijuana River Natural Estuary, San Diego regional beaches, and the Pacific Ocean.

Table 2-1 Lift Stations Proposed for Rehabilitation

Name	Date of Construction	Age (years)	Number of Pumps	Pumping Capacity (gpm)
PB CILA	1991	28	9	40,893
PB-1A, PB-1B	1978	41	4 / 10	15,850 / 39,625

Alternative 2 also includes building new infrastructure in Mexico, specifically, the construction of a new intake from the Tijuana River channel to PBCILA. A new intake will aid in the elimination of Tijuana River dry-weather flows at 25 mgd and will supplement efforts to eliminate untreated discharges to the river. Together with the rehabilitations of PBCILA, PB1A, and PB1B, the project will help protect public health and the environment on both sides of the border.

3.0 AFFECTED ENVIRONMENT

This section describes the environmental resources in the U.S. that may be affected by the proposed action or the no action alternative described in Section 2.0. The description of the environmental setting focuses on environmental resources located within the U.S. near the U.S.-Mexico border. However, environmental resources in Mexico are also described in some instances when there is a direct correlation between resources in both countries.

3.1 LAND USE

Urban development extends north from the City of Tijuana to the border. The environmental setting in the vicinity of the border in the U.S. is characterized by a combination of urban, industrial, rural, and open space land uses. Important features of this area include the Pacific Ocean, the Tijuana River Valley, and the community of San Ysidro, the main urban border community in the U.S. within the study area.

Important land uses in the Tijuana River Valley are the Tijuana River National Estuarine Research Reserve (TRNERR), the Imperial Beach Naval Air Station, the Border Field State Park and the San Diego County Tijuana River Valley Regional Park. The Tijuana River Estuary is designated by the National Park Service as a National Natural Landmark and is "one of the finest remaining saltwater marshes on the California coastline." (NPS, 2021)

The Mexican Federal government has designated 173 Natural Protected Areas in Mexico. The closest Natural Protected Area in Mexico to the area of concern is the *Constitucion de 1857,* approximately 70 miles (113 km) southeast of Tijuana (Comisión Nacional de Áreas Naturales Protegidas, 2019). Located in the pine forests of Sierra de Juárez mountain range, the park is an important preserve for a large number of native wild animals like Bighorn Sheep and Mule Deer. The park is characterized by the large variety of coniferous species.

The coastal zone boundaries extend west from the point where the Tijuana River enters the U.S to the Pacific Ocean, which includes the entire Area of Concern in the U.S. 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. Furthermore, thanks to the Coastal Zone Management Act of 1972, natural resources within coastal zones, such as estuaries, beaches, wetlands, among others, are protected.

3.2 TOPOGRAPHY AND SOILS

Topographic features include the relatively flat alluvial plain of the Tijuana River with tributary canyons and hillsides extending up into Mexico. The elevations in the study area range from sea level at the Pacific Ocean, to 100 feet (30 m) in the Tijuana River Canal in Mexico, to nearly 800 feet (244 m) at the highest of the sewer collector lines described in Section 2.

The mudflats at the mouth and lower parts of the Tijuana River Estuary are occasionally covered by sands transported during storms. The soils suitable for agriculture occur upstream from the flats. To the south, the fine sandy loams blanketing the mesas and terraces are also considered highly erodible and are contributing substantially to downstream sedimentation (TRNERR, 2021).

3.3 WATER RESOURCES

3.3.1 Surface Water

The two major surface water features in the area of concern are the Tijuana River and the Pacific Ocean. The Tijuana River originates at the confluence of Arroyo del Alamar and Río de las Palmas in Mexico and drains into the Pacific Ocean. The Tijuana River watershed is 1,700 square miles with 73 percent in Mexico (TRNERR, 2021). Two smaller features located within this watershed include the Abelardo L. Rodriguez dam and the El Carrizo dam. Flows in the river consist typically of a combination of natural runoff, effluent discharges, and fugitive flow resulting from water and wastewater leaks.

According to CESPT, 87% of the municipal water used in Tijuana, Baja California, comes from surface water and 13% comes from ground water sources. Tijuana has a demand for 54.78 mgd of water. Approximately 8% is supplied from the Tijuana River, 8% from the Water Treatment plant on the Abelardo L. Rodriguez dam, and 84% from the El Florido water treatment plant, which receives water from the Colorado River-Tijuana Aqueduct. (TEID, 2019).

Treated effluent from Tijuana's three wastewater treatment plants is discharged into the Tijuana River or the Pacific Ocean. Table 3-1 shows 2018 water quality effluent information for the Arturo Herrera, La Morita, and San Antonio de los Buenos wastewater treatment plants.

Table 3-1 2018 Water Quality of the WWTP Effluent in Tijuana, Mexico

WWTP	Parameter	Mexico Standards (LMP NOM 001 SEMARNAT-1996)	Q1	Q2	Q3	Q4
Arturo Herrera	TSS (ppm)	125	138.7	6.7	6.3	7.0
	BOD (ppm)	150	5.0	5.0	5.0	5.3
La Morita	TSS (ppm)	125	10.3	9.3	10.0	14.0
	BOD (ppm)	150	6.7	5.0	9.0	11.0
*San Antonio de los Buenos	TSS (ppm)	125	168.9	105.3	152.3	63.7
	BOD (ppm)	150	641.9	132.3	150.3	78.0

*SAB WWTP currently not in operation

Table 3-2 Tijuana River Collection System Average Monthly Flows*
*Estimates. Table does reflect entire collection system

	OCT 2020		FEB 2021		APR 2021	
Segment	L/S	MGD	L/S	MGD	L/S	MGD
Tijuana River to PBCILA	1112	25.4	1634	37.3	1553	35.4
PBCILA to Int'l Collector	1105	25.2	337	7.7	159	3.6
PB CILA to PB1A	998	22.8	1297	29.6	709	16.2
SBWITP influent	1352	30.9	935	21.3	910	20.8
PB1A effluent	370	8.4	189	4.3	395	9.0
PB1B effluent	1265	28.9	596	13.6	826	18.9

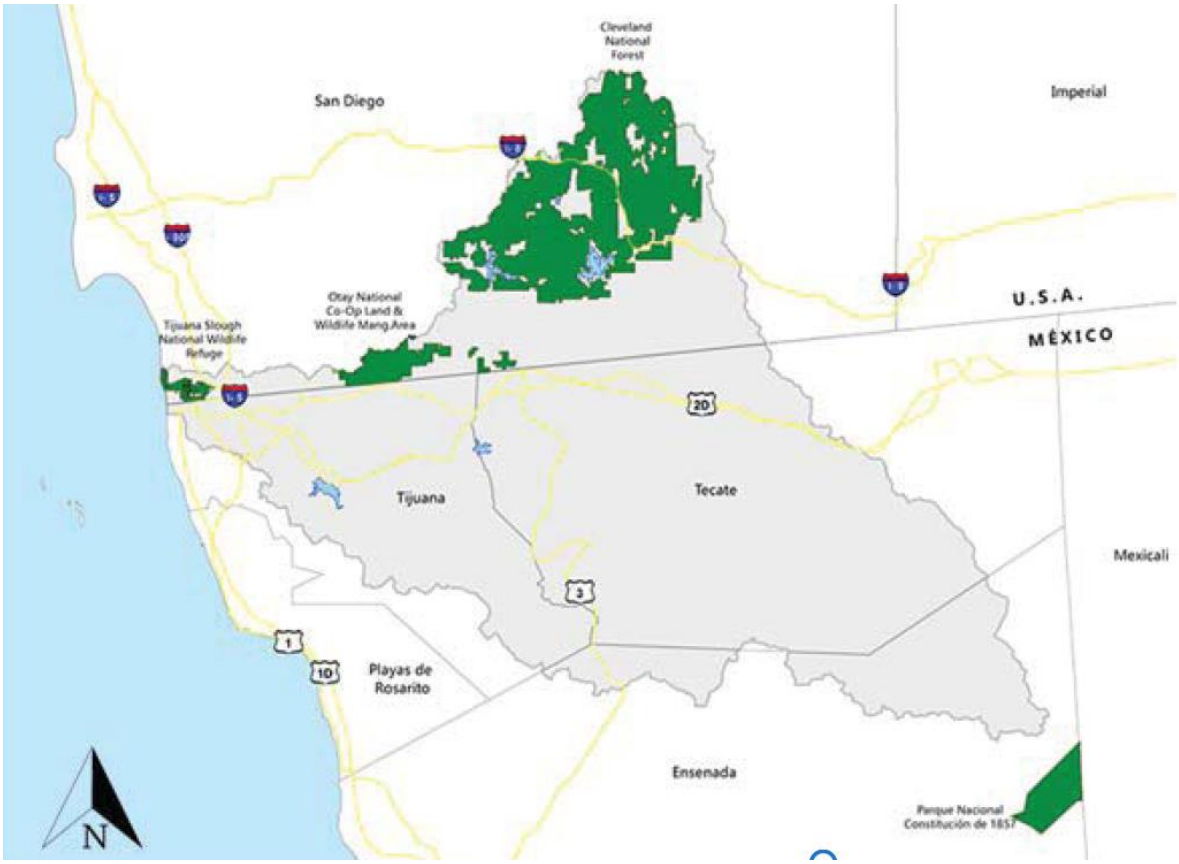
Ocean water quality off the coast of Tijuana and San Diego is affected by surface runoff that flows to the ocean and by discharges from wastewater plants. The San Antonio de los Buenos WWTP, located approximately 4.3 miles (7 km) south of the border, has recently faced technical and administrative deficiencies, leading to untreated wastewater being discharged directly into the ocean. Through a research partnership with SCRIPPS Institute of Oceanography, it has been found that the coastal currents in the region occasionally move from south to north. In the right conditions, discharges from the San Antonio de los Buenos WWTP reach San Diego Bay, as far north as Coronado, California, affecting ocean water quality throughout the area.

The SBIWTP is located in San Diego and treats wastewater from Tijuana at a secondary level. The SBIWTP discharges into the bay through an underwater outfall pipe (i.e., the South Bay Ocean Outfall – SBOO), which helps to dilute effluent entering the ocean and to reduce environmental impacts.

3.3.2 Groundwater

Tijuana is located over the Tijuana Groundwater Basin seen in Figure 3-1. The basin has a surface area of 11.6 square miles and extends across the international border between Mexico and the U.S. According to the California Department of Water Resources, the groundwater "contains sodium chloride characteristics and Total Dissolved Solids (TDS) that range from 1,120 to 3,620 mg/L (California Department of Water Resources, 2006).

Figure 3-1 Groundwater Aquifer (Gonzalo Rio Arronte Foundation 2016)



3.3.3 Floodplains

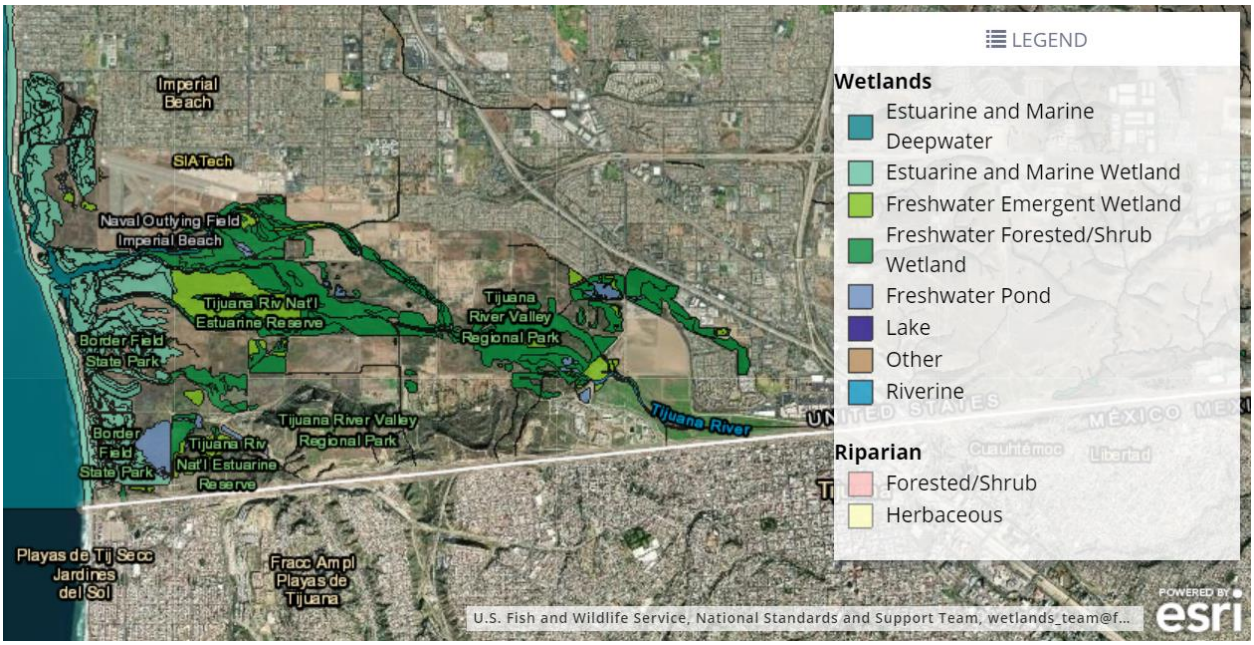
The Tijuana River transitions from a natural riverbed, south of Tijuana, to a concrete lined canal designed to hold floodwaters once it reaches the highly urbanized City of Tijuana. After making its way north across the border into the United States, the river channel runs through the Tijuana River valley. Any remaining flows ultimately end up flowing into the Pacific Ocean.

Downstream of the border, the U.S. IBWC operates the Tijuana River Flood Control Project, which extends for 2.3 miles (3.7 km) (IBWC, 2005). Downstream of the IBWC flood control project, the Tijuana River valley in the U.S. consists of a broad natural floodplain containing a variety of wetland and riparian areas. A wide swath of the Tijuana River valley in the U.S. is in the 100-year floodplain. A 100-year flood has a 1 percent chance of occurring in any given year.

3.3.4 Wetlands

The 2,800-acre estuary reserve was designated as a wetland of international importance within the nation. It extends east from where the Tijuana River meets the Pacific Ocean and encompasses tidally flushed wetlands, riparian and upland habitats extending immediately north of the U.S. and Mexico border (City of San Diego 2007). The closest key wetland in Mexico to Tijuana identified by Ducks Unlimited de México is a palustrine emergent wetland measuring 4,675 acres (1,892 hectares) located approximately 127 miles (205 kilometers) to the southeast of Tijuana.

Figure 3-2 Wetlands adjacent to Tijuana River (USFWS, 2021)



3.4 AIR RESOURCES

The San Diego Air Basin (SDAB) would, in general, be the area of influence for this project.
The climate in San Diego County is typical of a Mediterranean climate. In general, most rains fall from January to March. Average temperatures reach annual lows of 46°'F (8°C) in winter and rise to 74°F (23°C) in summer. Prevailing winds come from the northwest in winter and from the

southwest in summer. Weather is monitored at the TRNERR as part of the National Estuary Research Reserve System-Wide Monitoring Program (SWMP) (TRNERR 2010).

3.4.1 Air Quality

The Clean Air Act (CAA) of 1970 and the CAA amendments in 1977 and 1990 required the adoption of national ambient air quality standards (NAAQS) for sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), 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 national ambient air quality standards (NAAQS), and include sulfates, hydrogen sulfide (H_2S), vinyl chloride, and visibility reducing particles.

Table 3-2 shows the annual number of days that pollutants exceeded the state and federal ambient air quality standards in the SDAB during 2017 to 2019.

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

Pollutant		Number of Days over Standard		
		2017	2018	2019
Ozone (8-Hour Standard)	Federal[A]	54	23	19
	State	57	25	21
Particulates (PM10)	Federal	0	0	1
	State	4	3	8
Particulates (PM2.5)	Federal	1	1	0
	State*			

Source: http://www.arb.ca.gov/adam/
*Insufficient Data Available
[A] National '15 8-Hour

The SDAB currently has a federal and state ozone designation of nonattainment (CARB 2021). For PM-10, the SDAB is listed as unclassified with the federal standards and under nonattainment for state designation. Finally, its federal designation for PM-2.5 stands at attainment and nonattainment for its state designation. (CARB 2021).

3.4.2 Odor

Odors have been reported near the Tijuana River channel and coastal zones, particularly around the City of Imperial Beach, CA. They are thought to originate from wastewater discharges carried by the Tijuana River from Mexico.

3.5 NOISE

The area of concern is limited to U.S. zones immediately adjacent to the international boundary. Due to the highly urbanized nature of Tijuana, the area of concern is characterized primarily by vehicular noise from car and truck travel, commercial aircraft noise from operations at the Tijuana Airport, aircraft operations associated with Brown Field and the Imperial Beach Naval Auxiliary Landing Field, and general urban activities.

3.6 VEGETATIVE HABITAT

San Diego County falls under the Southern and Central California Chaparral and Oak Woodlands ecoregion. This region is characterized as having a Mediterranean climate of hot dry summers and cool moist winters, and associated vegetative cover comprising mainly chaparral and oak woodlands with grasslands occurring in some lower elevations and patches of pine being found at higher elevations (EPA 2013).

Habitat types within the Tijuana River Valley and Tijuana Estuary include beach, saltpan, southern foredunes, tidal estuary, coastal salt marsh, riparian wetlands, coastal sage scrub, southern maritime chaparral, maritime succulent scrub, southern willow scrub, and mulefat scrub (USIBWC 2005).

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 while areas west of Dairy Mart Road and north of Monument Road 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 extends approximately 3 miles east from the Pacific Ocean (BECC 2008). The Tijuana Estuary is an essential breeding, feeding, and nesting ground for over 370 bird species (California Department of Parks and Recreation 2013). Here, freshwater from the Tijuana River mixes with the saltwater from the Pacific Ocean, this fusion creates a salt marsh -- a 'large wetland habitat dominated by low lying vegetation' (TRNERR, 2021).

3.7 WILDLIFE RESOURCES

The Tijuana River estuary is home to at least 370 species of birds, 320 of which are migratory. Mammals that inhabit the estuary land include mice, California ground squirrels (*Otospermophilus beecheyi*) and rabbits. The estuary's small tidal creeks and channels contain at least 20 species of fish, plus crabs, rove beetles (*Staphylinus sp.*), tiger beetles (*Cicindela sp.*), and wandering skippers (*Panoquina errans*) (IBWC 2005).

3.7.1 Threatened and Endangered

The U.S. Fish and Wildlife Service has listed 59 threatened or endangered species as having the potential to occur in San Diego County (USFWS, 2021). Federally listed endangered and sensitive species may be found in the general vicinity of the estuary where suitable habitat is present (IBWC 2005).

3.8 CULTURAL RESOURCES AND AESTHETICS

There are no Native American reservations in the area of concern in the U.S. (EPA, 2016). There are 206 locations in San Diego County listed on the National Register of Historic Places, California State Historical Landmark, California Register of Historical Resources or as a Point of Historical Interest (OHP, 2021).

3.9 SOCIOECONOMICS

The racial composition of the County of San Diego and the State of California are both predominantly white with the County of San Diego, per the latest U.S. Census Bureau data, boasting a 1.5 percent lower poverty rate. San Diego County is projected to grow at a slower rate than the State of California through 2050.

3.10 MUNICIPAL SERVICES

3.10.1 Water and Wastewater Services

The Comisión Estatal de Servicios Públicos de Tijuana (CESPT) provides water and sewer service for Tijuana and Playas de Rosarito. The vast majority of residents and businesses in the project area are connected to the water distribution and wastewater collection systems.

3.10.2 Waste Management

Solid waste collection is provided by the Municipality with a coverage rate of 94 percent within the city limits. This coverage is far higher than Mexico's average of 68 percent for cities with a population of 50,000 or higher (SciELO, 2012). Solid waste is sent to private landfills, in Tijuana and Playas de Rosarito, operated by the company GEN Tijuana.

3.10.3 Transportation

The District of San Ysidro's location on the US/Mexico border allows events in Tijuana to potentially influence conditions in Mexico, and vice versa. The distance from the center of San Ysidro to downtown Tijuana is only about 2.85 miles (4.59 kilometers). As the busiest land port of entry in the western hemisphere, since 1996 when data first became available, the San Ysidro Land Port of Entry processes an annual average of 35.6 million people, including pedestrians, private vehicle passengers, and bus passengers (USDOT, 2021).

3.10.4 Energy

Ninety nine percent of residents of the Tijuana municipality have access to electricity (SEGOB 2010). Electricity is provided by the Federal government through the *Comisión Federal de Electricidad* throughout Mexico.

3.11 HUMAN HEALTH AND SAFETY

Current health concerns are associated with discharges of raw or inadequate sewage collection in neighborhoods in Tijuana. Discharges occur in part due to failing infrastructure that is already past its useful life and is in need of repair or replacement. However, the exponential urban growth of Tijuana has also contributed to wastewater discharges. Much of this growth consists of unlawfully established settlements lacking wastewater connections and typically located on hillsides prone to erosion.

4.0 ENVIRONMENTAL CONSEQUENCES

Potential impacts are described for each of the alternatives considered. For the resource areas where effects will occur, the different types of effects (e.g. beneficial, adverse) are identified for each resource (e.g. air, water). Furthermore, cumulative impacts and irreversible commitment of resources for each alternative are described.

The description of impacts is focused specifically on impacts to U.S. resources, but may contain descriptions of impacts in the entire area of concern, which encompasses the City of Tijuana, the community of San Ysidro, the Tijuana River from Tijuana to the Pacific Ocean, the sites of proposed wastewater collection improvements, the existing wastewater treatment plants, and effluent discharge locations.

Under the no action alternative (Alternative 1), rehabilitation and/or replacement of the lift stations and construction of a new Tijuana River intake would not occur and the use of the existing infrastructure would continue. Alternative 2 seeks to rehabilitate lift stations PBCILA, PB1A and PB1B and incorporate the construction of a new Tijuana River intake of approximately 289 ft (88 meters) with a 48-in fiberglass reinforced (FRP) pipe.

4.1 Land Use

Under the no action alternative, rehabilitation and/or replacement of the lift stations and construction of a new Tijuana River intake would not occur and the use of the existing infrastructure would continue. The no action alternative would not affect land, use since no construction would take place.

There would be no transboundary effects on land use for Alternative 2. All construction would take place in existing streets and rights-of-way in Mexico. No construction would take place that would affect important farmland or coastal zones.

4.2 Soils and Topography

Under the no action alternative, adverse impacts to soil from raw sewage and spillovers from failing collector lines would continue since no rehabilitation and/or replacement of the lift stations and construction of a new Tijuana River intake would occur.

The proposed action would address the adverse impacts to soil of raw sewage from the aging lift stations. During construction, standard measures will be in place to control erosion and dust.

4.3 WATER RESOURCES

4.3.1 Surface Water

Under the no action alternative, the risk of raw sewage leaks and spillovers would remain due to the continuous operation of aging lift stations. These leaks have a negative impact on surface water quality in Mexico. In addition, on those days when the Tijuana River flows into the U.S., there could be adverse impacts to water quality on the U.S.-side from contamination of the river water from raw sewage.

With the proposed action, surface water quality within the Tijuana River will improve once lift stations are rehabilitated. More improvements will be expected once rehabilitation operations to the SAB WWTP are completed. Thus, on those days when Tijuana River flows into the U.S., the potential adverse impact to U.S. surface water would also be reduced.

During construction, wastewater flows would be diverted to unaffected collection lines within the Tijuana wastewater collection system and to SAB WWTP, pending rehabilitation operation. Impacts on surface water resources due to construction activities would not be significant, given that all storm water pollution prevention regulations would be followed. Water resources, particularly the Tijuana River, are expected to improve in water quality over the long term due to a decrease in wastewater contamination under this alternative (TEID, 2019).

4.3.2 Groundwater

Under the no action alternative, intermittent raw sewage leaks and spillovers would continue due to the continuous operation of aging lift stations. These leaks have a negative impact on groundwater water quality in Mexico. In addition, on those days when the Tijuana River flows into the U.S., there could be adverse impacts to groundwater quality on the U.S.-side not only from contamination of the river water from raw sewage but also from contamination of the Tijuana Groundwater Basin Aquifer.

With the proposed action, groundwater quality will improve as a result of the reduction in wastewater spills. During construction, wastewater flows would be diverted to unaffected collection lines within the Tijuana wastewater collection system. Impacts on surface water resources due to construction activities would not be significant, given that all storm water pollution prevention regulations would be followed. Water resources, particularly the Tijuana River, are expected to improve in water quality over the long term due to a decrease in wastewater contamination under this alternative (TEID, 2019).

4.3.3 Floodplains

Floodplains would not be affected under the no action alternative since no construction would take place with this alternative.

With the proposed action, there no construction activities would take place within established floodplains and thus, there would be no impacts. Similarly, there would not be any impacts to the volume of surface water flows to the Tijuana River during construction or operation.

4.3.4 Wetlands

Wetlands would not be directly affected by the no action alternative since no construction would take place.

Wetlands would not be directly affected by the proposed action alternative since no construction would take place in or around wetlands. In addition, the volume of surface water to the Tijuana River would not substantially increase, thus there would not be any indirect impacts to wetlands.

4.4 AIR RESOURCES

4.4.1 Air Quality

No impacts to air quality would occur from the no action alternative.

Under proposed action, impacts to air quality from construction activities would involve fugitive dust and emissions from construction equipment. These would be temporary and would return to their original ambient levels once construction activities cease. There would be no longer-term impacts to air quality from the proposed project.

4.4.2 Odors

Under the no action alternative, there would be no changes to odors within the project area. Air quality may be improved with the proposed action as a result of wastewater spills reduction, once the lift stations are rehabilitated.

4.5 NOISE

Under the no action alternative, there would be no changes to noise levels within the project area. Due to the highly urbanized nature of Tijuana, there would be not be any significant increase in noise levels under the proposed action.

4.6 VEGETATIVE HABITAT

Under the no action alternative, there would be no impacts to vegetative resources since no construction would occur. Under the proposed action, all activities would occur within already disturbed sites, located in a highly urbanized area of Tijuana. Vegetation within the project area is highly disturbed.

4.7 WILDLIFE RESOURCES

Under the no action alternative, there would be no impacts to wildlife resources since no construction would occur. Under the proposed action, all activities would occur within already disturbed sites, located in a highly urbanized area of Tijuana. Vegetation within the project area is highly disturbed and does not support wildlife resources.

4.8 CULTURAL RESOURCES AND AESTHETICS

No impacts to cultural resources or aesthetics would occur from the no action alternative. There would also be no impacts to cultural resources or aesthetics from the proposed action, all construction would occur in previously developed roadways.

4.9 SOCIOECONOMICS

There would not be any adverse impacts on socioeconomics from the no action alternative and the proposed project. The proposed project would help mitigate raw sewage spills, which would provide a positive impact to the community within the project area.

4.10 MUNICIPAL SERVICES

Under the no action alternative, there continues to be a risk to human health and the environment due to exposure to raw sewage from failing lift stations.

Short-term impacts on municipal services from the proposed project would include traffic disruption in Mexico during work on roadways and within easements. There would be no transboundary effects on municipal services for this alternative. Under the proposed action alternative, provisions will be made to maintain wastewater collection service to residents within the project area during construction. There would be no effects to energy or waste management.

4.11 PUBLIC HEALTH AND SAFETY

Without an adequate wastewater collection system in Tijuana, exposure to raw wastewater would continue to occur. This exposure negatively impacts public health in Tijuana and the United States once it crosses north into San Diego, California. By continuing to use deteriorated wastewater infrastructure, a risk of roadway, lift station failure, or collector collapse would continue. These events, though infrequent, pose a serious risk to public health safety in both countries.

The proposed alternative would mitigate exposure to raw sewage and would promote improvements in sanitary conditions within the project area and consequently reduce risks to public health.

4.12 CUMULATIVE EFFECTS

CEQ defines cumulative impacts as an "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (by various agencies or individuals)" (40 CFR 1508.7). Informed decision-making is served by consideration of cumulative impacts resulting from projects that are proposed under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future.

The proposed action would rehabilitate lift stations PBCILA, PB1A and PB1B and incorporate the construction of a new Tijuana River intake of approximately 289 ft (88 meters) with a 48-in fiberglass reinforced (FRP) pipe. These improvements are expected to generate positive cumulative impacts on both side of the border, since water quality within the Tijuana River Watershed will be improved. The proposed project would reduce potential risks to human health and the environment.