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(U.S. Environmental Protection Agency and International Boundary and Water Commission)

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APPENDICES

1. INTRODUCTION

1.1 Background

The Tijuana River watershed is a 1,750-square-mile watershed that includes portions of San Diego County in California and northern Baja California in Mexico. Approximately three-quarters of the watershed is in Mexico, including the cities of Tijuana and Tecate. The remaining quarter is in the United States (U.S.), including portions of the cities of San Diego and Imperial Beach. The Tijuana River originates in Mexico and flows northwest, crossing into the U.S. before ultimately discharging to the Pacific Ocean via the Tijuana River Estuary (see Figure 1-1).

Deficiencies in the treatment, piping, and pump station network in Tijuana contribute to contaminated transboundary flows entering the U.S. via coastal waters of the Pacific Ocean, the Tijuana River, and tributaries that flow north through canyons to the Tijuana River Valley and Estuary. Polluted transboundary maritime flows threaten the health of communities along the border and the coast, impact marine and estuarine ecosystems, damage agricultural resources, negatively impact the economy, and have the potential to affect training flexibility for U.S. military activities, as there are U.S. Navy facilities within the affected area. Transboundary flows in the Tijuana River and its canyon tributaries routinely reach the U.S., bringing untreated wastewater, trash, and sediment into the U.S. These contaminated flows negatively impact U.S. Customs and Border Protection (CBP) personnel and can reach the Pacific Ocean through the Tijuana River Valley and Estuary and migrate north along the coast, compounding the impacts of coastal discharges from the Tijuana area described above. Untreated wastewater contributes to high bacterial concentrations in the Tijuana River and tributaries, creates health risks for recreational users, and introduces other pollutants of concern that have led to the Tijuana River being listed as an impaired water body under Section 303 of the Clean Water Act (CWA).

In 1889, the International Boundary Commission (IBC) was established by the U.S. and Mexico to address concerns related to land jurisdiction and river boundaries. Transboundary flows crossing into the U.S. from Mexico have raised water quality and human health concerns since at least the 1930s. The U.S. and Mexico have relied on binational collaborative efforts to address pollution near the border of Tijuana and San Diego, as summarized below:

- 1944: The Treaty of February 3, 1944 created a joint commission to address issues related to the ownership of waters, sanitation, water quality, and flood control. The Treaty renamed the previously existing IBC to the International Boundary and Water Commission (IBWC). The U.S. is represented on the IBWC by the U.S. International Boundary and Water Commission (USIBWC) and Mexico by the Comisión International de Limites y Aguas (CILA), Sección Mexicana.

- 1965: The IBWC signed Treaty Minute No. 222, allowing for emergency sewer connection of the City of Tijuana to the City of San Diego.

- 1972: The CWA was created, giving federal authority to the U.S. Environmental Protection Agency (EPA) to regulate discharges into U.S. waters to improve water quality.

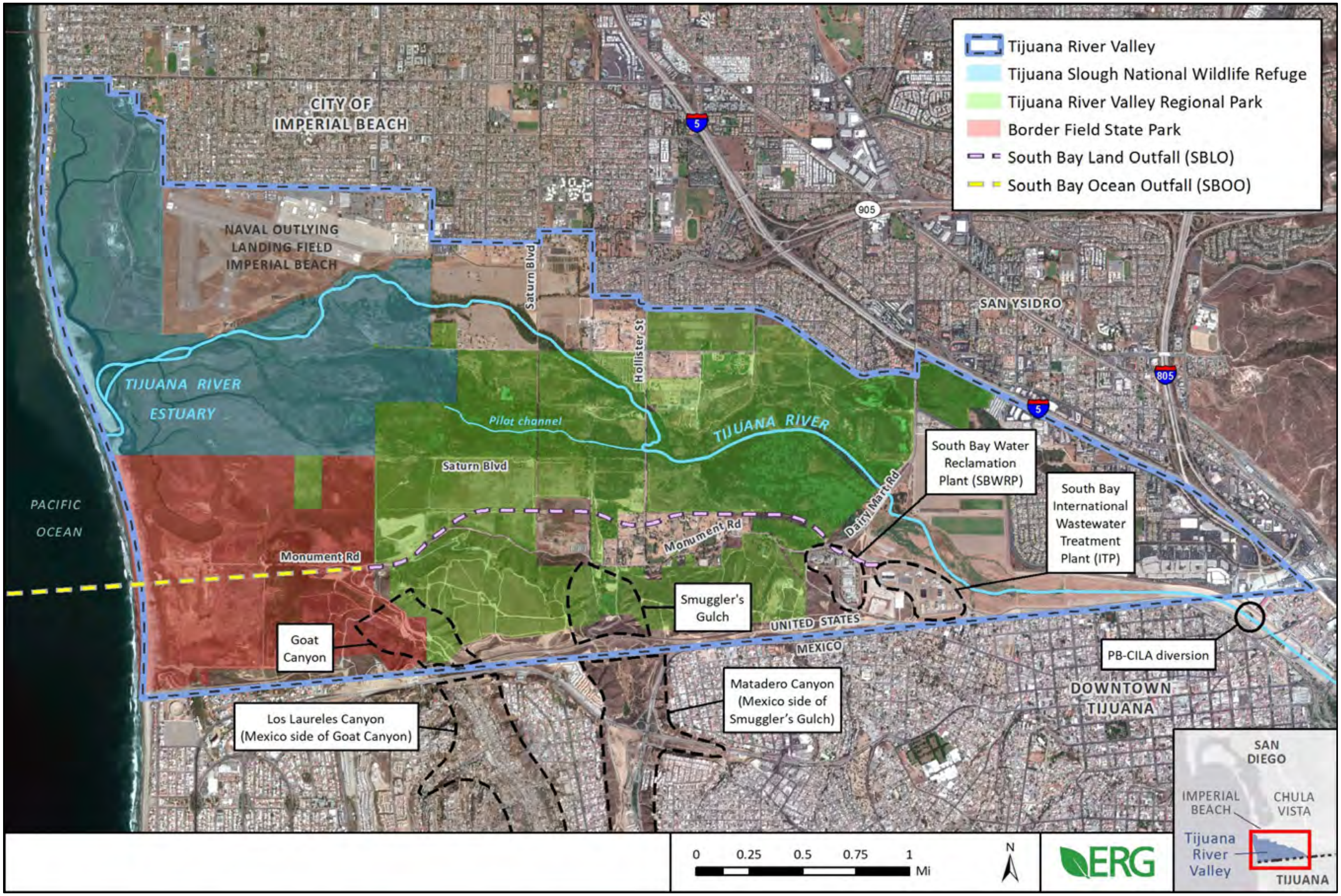


Figure 1-1. Overview of Tijuana River Valley

- 1983: Through the 1983 La Paz Agreement, the U.S. and Mexico agreed to protect and enhance the environment surrounding the U.S.-Mexico border. The La Paz Agreement set the framework to give joint authority to EPA and Mexico's Secretariat of Environment and Natural Resources (Secretaría de Relaciones Exteriores, or SEMARNAT) for addressing border pollution.

- 1985: IBWC signed Treaty Minute No. 270, providing recommendations for first-stage treatment in Tijuana.

- 1990: USIBWC and CILA adopted Treaty Minute No. 283, which stipulates that "the Government of Mexico will assure that there are no discharges of treated or untreated domestic or industrial wastewaters into waters of the Tijuana River that cross the international boundary."

- 1994: Through the North American Free Trade Agreement (NAFTA), the U.S. and Mexico agreed to collaborate to develop joint environmental infrastructure projects, leading to the creation of the Border Environment Cooperation Commission and the North American Development Bank (NADBank), which help implement and finance water and wastewater treatment projects along the U.S.-Mexico border.

- 1997: USIBWC and CILA collaborated to construct the South Bay International Wastewater Treatment Plant (ITP) in the U.S. in response to a noticeable increase in transboundary flows occurring due to population growth in Mexico throughout the 1980s and 1990s. The project was completed in 1997, with advanced primary treated effluent discharged to the Pacific Ocean via the Point Loma outfall. Upon completion of the project, untreated wastewater that would enter the river was diverted to the new treatment plant, resulting in improved water quality in the Tijuana River.

- 1999: USIBWC began discharging treated ITP effluent to the Pacific Ocean via the newly constructed South Bay Ocean Outfall (SBOO) instead of the Point Loma outfall.

- 2000: The Tijuana River Valley Estuary and Beach Sewage Cleanup Act of 2000 (Public Law 106-457) was passed.

- 2005: USIBWC finalized the Supplemental Environmental Impact Statement (EIS) for CWA compliance at the ITP and issued a Record of Decision (ROD) for an advanced primary facility with secondary treatment in Mexico. In 2008, USIBWC rescinded the previous ROD and issued a Revised ROD to upgrade the ITP under the Activated Sludge with Expanded Capacity Alternative.

- 2013: The binational Border 2020 program was established in 2013 in accordance with the 1983 La Paz Agreement. EPA and SEMARNAT identified the reduction of bacteria, sediment, and trash into the Tijuana River Estuary as a top priority in the eight-year binational program. EPA has since engaged with agencies, elected officials, and stakeholder groups in both the U.S. and Mexico to help identify solutions to the persistent water quality issues in the San Diego–Tijuana region.

- 2015: IBWC adopted Treaty Minute No. 320, which aims to reduce bacteria, sediment, and trash in the Tijuana River watershed through binational collaboration. Recent deterioration of infrastructure in Mexico—including many critical collection lines and pumps and the San

Antonio de los Buenos Wastewater Treatment Plant (SABTP)—led to increased frequency of poor water quality events (HDR, 2020a).

- 2018: The U.S. signed the United States–Mexico–Canada Agreement (USMCA), a trade agreement that renegotiated and replaced NAFTA.

- 2020: In January 2020, Congress passed the USMCA Implementation Act, which appropriated $300 million to EPA under Title IX of the Act for architectural, engineering, planning, design, construction, and related activities in connection with the construction of high-priority wastewater facilities in the U.S.-Mexico border area. Subtitle B, Section 821 of the Act authorized EPA to plan, design, and construct wastewater (including stormwater) treatment projects in the Tijuana River area. Based on that direction, EPA began coordinating an interagency and binational effort to plan, design, and construct infrastructure to reduce transboundary flows of untreated wastewater (sewage), trash, and sediment that routinely enter the U.S. from Mexico via the Tijuana River, its tributaries, and across the maritime boundary along the San Diego County coast. The projects identified through this effort form the basis of the alternatives evaluated in this PEIS.

- 2022: IBWC adopted Treaty Minute No. 328, which designates sanitation projects for immediate implementation in San Diego and Tijuana as well as projects for future consideration and negotiation. The treaty minute also identifies funding commitments from the U.S. and Mexico for each of the immediate projects. See Section 2.8 (Funding Sources and Binational Agreement) for additional information regarding this treaty minute.

On April 5, 2021, EPA published a Notice of Intent (NOI) to prepare an EIS (86 *Federal Register* [FR] 17595) for the Proposed Action pursuant to the requirements of the National Environmental Policy Act (NEPA) (42 United States Code [U.S.C.] 4321–4347). Since the NOI was issued, EPA decided to prepare a Programmatic EIS (PEIS) for the USMCA Mitigation of Contaminated Transboundary Flows Project, which sets forth a framework for tiered decision making. USIBWC is a joint lead agency for preparation of the PEIS. On June 17, 2022, EPA and USIBWC published a Notice of Availability (NOA) for the Draft PEIS (87 FR 36487). Section 7.3.5.4 (Summary of Changes Since the Draft PEIS) summarizes EPA and USIBWC's revisions to this document since release of the Draft PEIS. The Proposed Action in this PEIS includes projects that address the purpose and need described in Section 1.4 (Purpose and Need for Action) by achieving one or more of the following:

- Reducing the generation and/or discharge of contaminated flows from point and nonpoint sources of pollution in the Tijuana region.
- Improving the collection and/or treatment of contaminated flows in the Tijuana region before they reach the U.S.-Mexico border.
- Improving the collection and/or treatment of contaminated transboundary flows in the U.S.

This PEIS evaluates three alternatives: the No-Action Alternative, Alternative 1, and Alternative 2.EPA and USIBWC have identified Alternative 2 as the preferred alternative. This PEIS is prepared in accordance with the Council on Environmental Quality (CEQ) NEPA Implementing Regulations (40 Code of Federal Regulations [CFR] Parts 1500–1508 [2022]), EPA Procedures for Implementing NEPA (40 CFR Part 6), USIBWC NEPA Implementing Procedures (48 FR 44083), and Executive Order (EO) 12114 (44 FR 1957).

1.2 Existing Diversion and Treatment Infrastructure

Existing treatment facilities and associated infrastructure in the U.S. include the South Bay International Wastewater Treatment Plant, the South Bay Water Reclamation Plant, the South Bay Land Outfall, the South Bay Ocean Outfall, and the canyon collector system, which are described as follows (PG Environmental, 2021g) and identified in Figure 1-1, Figure 1-2, and Figure 1-3:

- The **South Bay International Wastewater Treatment Plant (ITP)** is located approximately 1.3 miles west of where the Tijuana River enters the U.S., and about one-half mile south of where Dairy Mart Road crosses over the Tijuana River. The existing plant is a primary and secondary treatment system designed to treat an average daily flow of 25 million gallons per day (MGD) of wastewater from the International Collector in Mexico (including diverted Tijuana River flows), as well as dry-weather flows from the canyon collector system. The ITP began operation in 1997 with advanced primary treatment, was expanded in 2011 to include secondary treatment, and was further expanded in 2018 to include additional secondary sedimentation tanks to improve activated sludge process performance. The ITP is owned by USIBWC and operated by a contract operator, Veolia.

- The **South Bay Water Reclamation Plant (SBWRP)** was constructed in 2002 by the City of San Diego on a 22-acre site adjacent to the ITP and currently treats wastewater collected from U.S. communities only. The existing SBWRP is designed to treat an average daily flow of 15 MGD and a peak daily flow of 35 MGD. The treatment process consists of preliminary, primary, and secondary treatment for discharged effluent, plus tertiary treatment and disinfection of effluent for beneficial reuse.

- The **South Bay Land Outfall (SBLO)** is a tunnel extending from the effluent distribution vault near the ITP and SBWRP to a point near the coastline and then discharges to the **South Bay Ocean Outfall (SBOO)**. The SBOO is a pipe, designed to handle an average flow of 174 MGD, with a wye diffuser system at the end that extends 3.5 miles offshore to discharge treated effluent from both the ITP and the SBWRP into the Pacific Ocean.

- The **canyon collector system** (Figure 1-2 and Figure 1-3) consists of canyon flow diversion structures[1] in Goat Canyon, Smuggler's Gulch, Cañón del Sol, Silva Drain, and Stewart's Drain in the U.S., which are designed to capture transboundary dry-weather flows from Mexico and convey them through canyon collector pipelines to the ITP for treatment and discharge to the Pacific Ocean through the SBOO. The average design flow rates of the diversion structures are 2.33 MGD at Goat Canyon, 4.67 MGD at Smuggler's Gulch, 0.67 MGD at Cañón del Sol, 0.33 MGD at Silva Drain, and 1.67 MGD at Stewart's Drain (Arcadis, 2019). Actual flows from the canyon collector system to the ITP average approximately 0.6 MGD in total (PG Environmental, 2021g).

[1] The canyon flow diversion structures along the U.S.-Mexico border consist of culverts, concrete approach pads, and grated intakes that drain to the ITP headworks via subsurface gravity piping. These are also referred to as "canyon collectors" in HDR (HDR, 2020a).

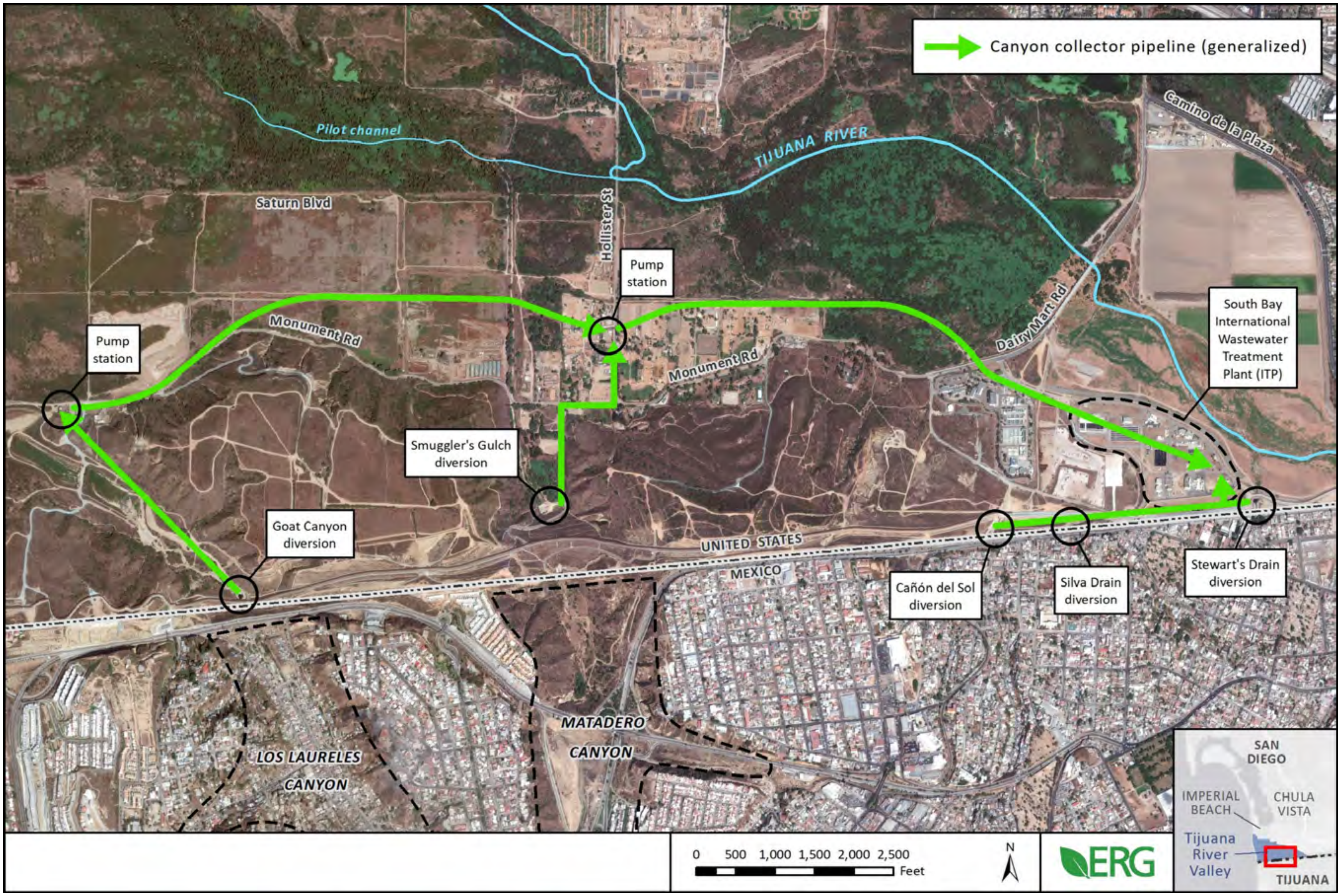


Figure 1-2. Overview of ITP Canyon Collector System

Goat Canyon

2.33 MGD design flow


Smuggler's Gulch

4.67 MGD design flow


Cañón del Sol

0.67 MGD design flow


Silva Drain

0.33 MGD design flow


Stewart's Drain

1.67 MGD design flow


Figure 1-3. Photographs of Canyon Flow Diversion Structures

Tijuana has a complex piping and pumping network to transfer both wastewater and wet-weather flows from a series of sources for treatment. Figure 1-4 shows the locations of key components of the system in Tijuana. Figure 1-5 provides a schematic illustration of the existing river and wastewater diversion system in Tijuana and its connection to the ITP. The existing infrastructure is described as follows (PG Environmental, 2021g, 2021j):

- Diverted river water and wastewater from the Tijuana River, and wastewater from the International Collector (the portion that is not conveyed to the ITP), are pumped to the **San Antonio de los Buenos Wastewater Treatment Plant (SABTP)**, which discharges into the Pacific Ocean via **San Antonio de los Buenos (SAB) Creek** at Punta Bandera. The SABTP began operation in 1987 as an aerated lagoon system with a design flow rate of 750 liters per second (lps) (17 MGD). It was expanded in 2003 with surface aerators to treat a flow rate of 1,100 lps (25 MGD). By the original design, the SABTP is intended to treat wastewater received from the International Collector via Pump Station 1B (PB1-B); however, as discussed in Section 1.3.1 (Causes of Contaminated Transboundary Flows), current operations at the SABTP do not effectively improve water quality prior to discharge.

- The **La Morita Wastewater Treatment Plant (WWTP)** is the easternmost WWTP in Tijuana, serving communities in the far southeast portion of the city and surrounding areas beyond the city boundary. The plant is designed for a capacity of 5.8 MGD. The **Arturo Herrera WWTP** is also located in eastern Tijuana, about 2 miles downstream from the La Morita WWTP and serving communities in southeast Tijuana. The plant is designed for a capacity of 10.5 MGD. Both plants' effluent is discharged, with reportedly high water quality (biochemical oxygen demand over a five-day period [BOD_5] under 10 milligrams per liter [mg/L]) (IBWC, 2020), to the Tijuana River upstream of the diversion.

- The **Planta de Bombeo CILA pump station (PB-CILA)** is located along the Tijuana River channel just south of the U.S.-Mexico border and is owned and operated by CILA. When the PB-CILA river diversion system is functioning properly, all dry-weather flow (up to 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. The PB-CILA river diversion system was upgraded in 2021 with a new river intake, new bar screens, a new vortex desander, and new pumps to improve reliability and provide the capability to divert up to 35 MGD of river flows.[2]

- The **International Collector** is located in the north area of Tijuana near the Tijuana River and the international border. It consists of about 1.5 miles of 72-inch reinforced concrete pipe with a design flow capacity of about 103 MGD. The International Collector receives untreated wastewater collected in downtown Tijuana and the portion of diverted river water from PB-CILA that is not sent to PB1-A. The mixture of untreated wastewater and river water flows by gravity in the International Collector from east to west. At the west end

[2] The recent PB-CILA capacity upgrade to 35 MGD is not, on its own, sufficient to allow diversion and treatment of more than 23 MGD unless supplemented by operational protocol changes (specifically, a new treaty minute to require diversion of 35 MGD) and modifications to address other failing components of the diversion and pumping system (specifically, PB1-A).

of the conveyance, a diversion box directs about 25 MGD to the ITP with the remainder being pumped to the SABTP by PB1-B.

- The **Tijuana metropolitan area wastewater collection system** collects wastewater from about 89 percent of city residents and, when functioning properly, conveys it to the ITP, SABTP, La Morita WWTP, or Arturo Herrera WWTP. The remaining 11 percent of Tijuana's current population does not have access to sanitary service (Arcadis, 2019). The population of Tijuana is projected to increase by nearly 40 percent from 2020 to 2050 (NADBank et al., 2020; PG Environmental, 2021g), resulting in significant additional volumes of domestic wastewater that require collection and conveyance to treatment facilities.

- **Pump Station 1A (PB1-A)** is a sanitary sewer pump station in Tijuana that receives flow from PB-CILA. It is operated by the Comisión Estatal de Servicios Públicos de Tijuana (State Public Service Commission of Tijuana [CESPT]), the Mexican public utility responsible for supplying drinking water and sewage services to Tijuana. PB1-A has a single operational parallel pump train consisting of a dual set of pumps in series. Under proper operating conditions, PB1-A receives diverted river water from PB-CILA and conveys these flows via one of two 10-mile pipelines (the "parallel conveyance pipelines") to an outfall into SAB Creek as shown in Figure 1-4. PB1-A's current pumping capacity of about 11.5 MGD (500 lps) is considered to be the limiting factor that prevents PB-CILA from diverting more flow from the Tijuana River. When PB1-A is not operating properly (often due to mechanical or electrical challenges), PB-CILA either pumps diverted river water into the International Collector or shuts off and allows transboundary flows to occur in the Tijuana River main channel.

- **Pump Station 1B (PB1-B)** is a sanitary sewer pump station in Tijuana operated by CESPT that receives flow from the International Collector. PB1-B has two parallel pump trains, each with a dual set of pumps in series. Flows from PB1-B are pumped south to the SABTP and SAB Creek via the parallel conveyance pipelines. PB1-B's total station pumping capacity is 23 MGD (1,000 lps). When PB1-B is operating at a reduced capacity (e.g., due to insufficient power availability), the ITP must receive a higher proportion of the flows in the International Collector, even if this results in exceeding the plant's design average daily flow capacity of 25 MGD.

- The Mexico-side **canyon pump stations** include the Matadero Pump Station in Matadero Canyon (i.e., the portion of Smuggler's Gulch in Mexico) and the Los Laureles 1 and Los Laureles 2 Pump Stations in Los Laureles Canyon (i.e., the portion of Goat Canyon in Mexico). When the pump stations are operating properly, approximately 6.3 MGD of dry-weather wastewater flows in the canyons are conveyed via the Tijuana sanitary sewer system to the SABTP, along with approximately 2.2 MGD of wastewater flows from the Playas Pump Station serving the Playas de Tijuana neighborhood. The canyon pump stations do not convey any "disconnected" flows that drain directly into the canyons.

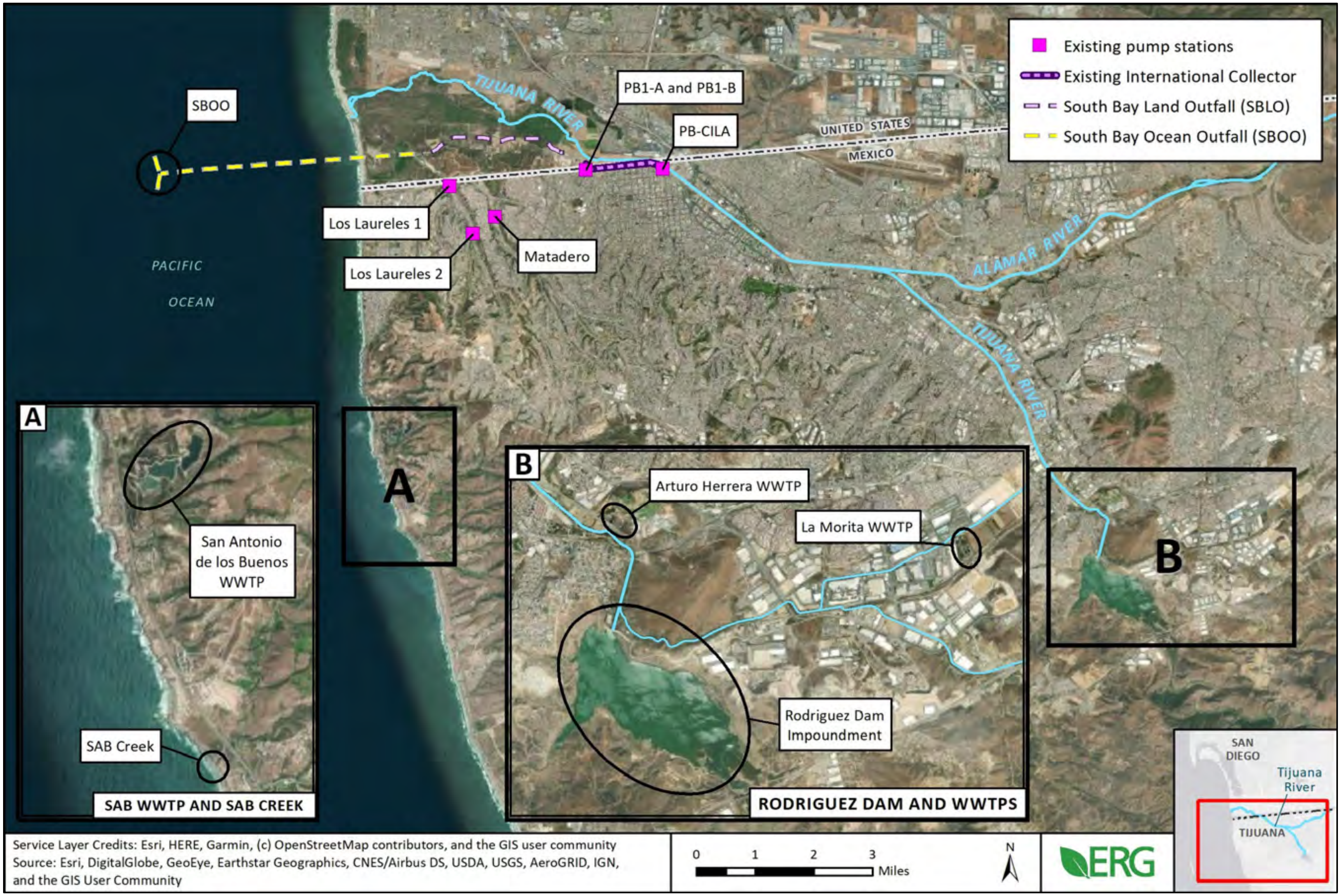


Figure 1-4. Overview of Existing Diversion and Treatment Infrastructure in Tijuana

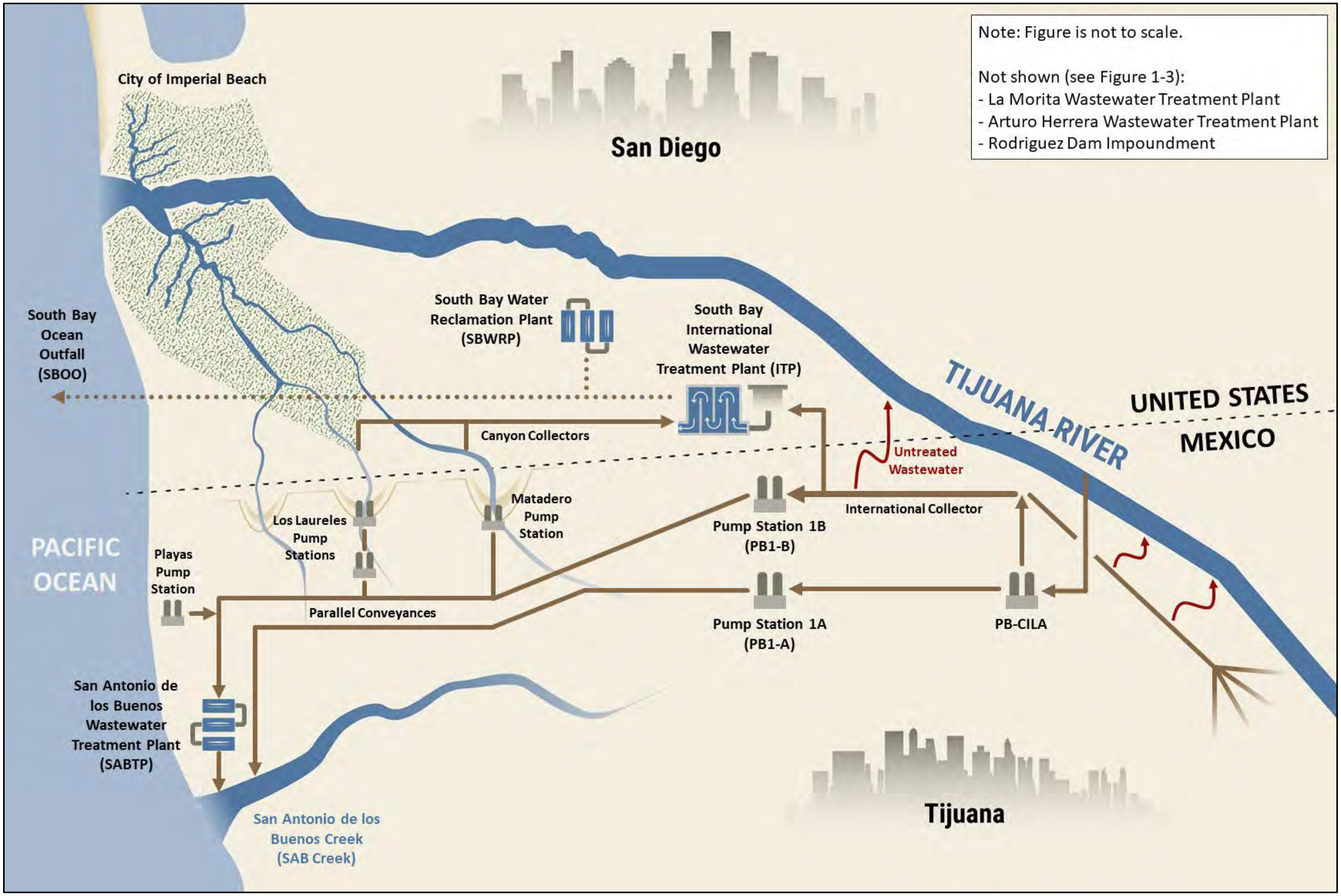


Figure 1-5. Schematic of Existing Wastewater Diversion and Treatment System

Rodriguez Dam, while not a component of the wastewater diversion and treatment system, controls flows from approximately 56 percent of the Tijuana River watershed (City of San Diego, 2012) and greatly influences flows in the Tijuana River and therefore the operation of the diversion system. The dam, located approximately 11 miles upstream from where the Tijuana River crosses the U.S.-Mexico border, impounds flows from the Río de las Palmas, creating the Rodriguez Dam impoundment. The watercourse downstream of the dam is identified as the Tijuana River. With construction completed in 1936, the Rodriguez Dam impoundment was originally intended to satisfy the water needs of Tijuana, a small city at that time (City of San Diego, 2012). However, the impoundment can no longer satisfy the current water demand of Tijuana. The Rodriguez Dam has a capacity of 76,210 acre-feet at the spillway crest and 111,070 acre-feet at the top of the spillway gates (IBWC, 1966). During the 2021 calendar year, the Rodriguez Dam had an average total storage of approximately 11,620 acre-feet. The dam only releases water to the Tijuana River during extreme runoff events. The water in the Rodriguez Dam impoundment falls under the jurisdiction of Comisión Nacional del Agua (CONAGUA) (PG Environmental, 2021f).

1.3 Causes and Impacts of Contaminated Transboundary Flows from Tijuana

1.3.1 Causes of Contaminated Transboundary Flows

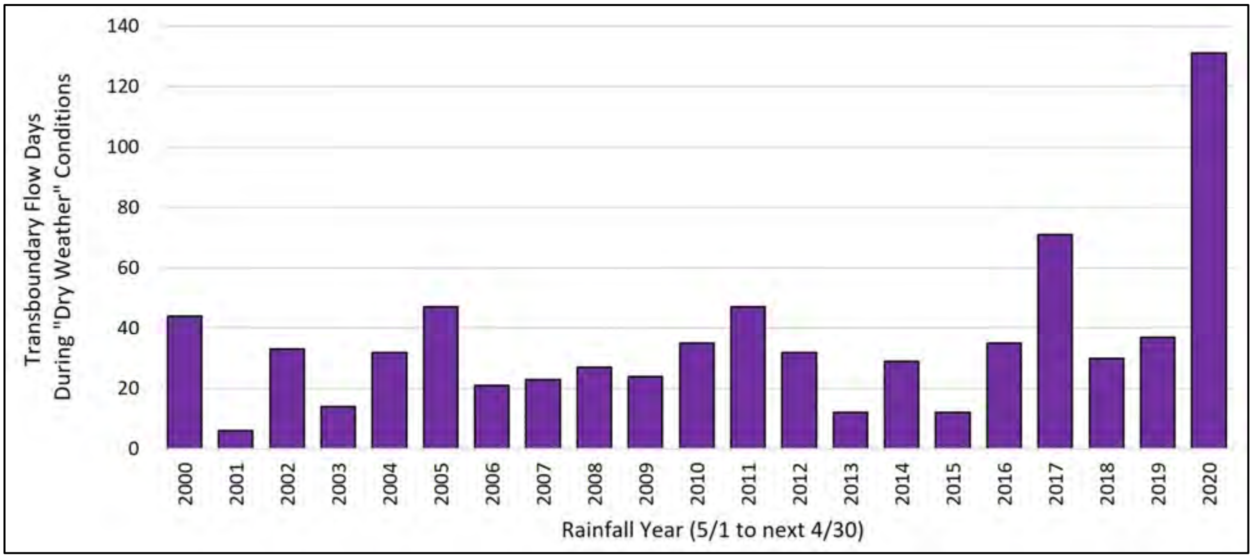
Deficiencies in the treatment, piping, and pump station network in Tijuana described in Section 1.2 (Existing Diversion and Treatment Infrastructure) contribute to contaminated transboundary flows entering the U.S. via coastal waters of the Pacific Ocean, the Tijuana River, and tributaries that flow north through canyons to the Tijuana River Valley and Estuary. Specific deficiencies, as summarized below, are described in further detail in the Feasibility Analysis memoranda for each project option and the Baseline Conditions Summary (PG Environmental, 2021d, 2021a, 2021b, 2021c, 2021e, 2021f, 2021g, 2021h, 2021j, 2021i, 2021k, 2021l, 2021m).

- **Conveyance of untreated wastewater and diverted river water to SABTP, and inability to treat these flows prior to coastal discharge via SAB Creek**. A variety of operational and capacity issues have necessitated that untreated wastewater flows from PB1-B be mixed with the river diversion flows from PB1-A, resulting in mixed Tijuana River water and wastewater being conveyed through the parallel conveyance pipelines to the SABTP or directly to SAB Creek. The SABTP in its current condition does not improve the water quality of the effluent. Additionally, river flows from PB1-A are designed to bypass the SABTP and are conveyed directly to SAB Creek. As a result of these two factors, approximately 35.5 MGD of mixed Tijuana River water and wastewater is discharged from the parallel conveyance pipelines to the Pacific Ocean via SAB Creek, approximately 28.2 MGD of which is untreated wastewater. These dry-weather flows can vary depending on a variety of factors, including PB-CILA operations, spills, and time of day. Seasonal marine currents cause these coastal discharges of largely untreated wastewater (sewage) to migrate north along the Pacific Ocean coast into the U.S.

- **Inconsistent diversion of dry-weather river and canyon flows.** Transboundary flows via the river and canyons along the border can occur at any time of the year when the diversion and pumping system is not functioning as designed. Breakdowns or power outages at the river diversion or canyon pump stations or physical blocking of the diversion inlets by trash frequently result in dry-weather flows crossing the border, bringing untreated wastewater, sediment, and trash into the U.S. Figure 1-6 shows a graphical representation of the number of days per year in which dry-weather transboundary river flows entered the U.S. during each rainfall year from 2000 to 2020. This figure shows significant increases in the occurrence of dry-weather transboundary flows during the 2017 and 2020 rainfall years, corresponding with extended periods where PB-CILA was shut down. As noted earlier in this section, the recent PB-CILA capacity upgrade to 35 MGD will not prevent these dry-weather river flows unless supplemented by further infrastructure and protocol modifications.

- **Inability to divert wet-weather river and canyon flows.** While dry-weather flows from the Tijuana River are intended to be diverted in Tijuana before reaching the U.S., the amount of river flow that occurs during and after rain events generally exceeds the capacity of the Tijuana diversion system. In such instances, to protect the pumps from sediment and trash, the river diversion and PB-CILA shut down (typically for a multi-day period), and flows cross the border into the U.S. instead. The flow rate in the river can reach several billion gallons per day during large rain events. Operators in Mexico reengage PB-CILA once river flows have subsided to within the pump’s operating capacity, a period that can range from a few days to weeks. Additionally, transboundary wet-weather flows in the canyons occasionally exceed the capacity of U.S.-side drainage systems, resulting in localized flooding and persistent road closures.

- **Deteriorating infrastructure in Mexico.** Other existing infrastructure in Mexico is in poor condition or is not properly maintained and contributes to transboundary flows of untreated wastewater. An average of approximately 10 MGD (based on 2016–2019 data) of wastewater escapes the Tijuana metropolitan area wastewater collection system and flows into the Tijuana River, primarily because of sewer system deterioration and pump station mechanical failures. Sanitary wastewater generated by the unsewered 11 percent of Tijuana’s current population appears to flow directly to the Tijuana River. In Goat Canyon, transboundary wastewater flows during dry weather have increased in the last two years, possibly due to increased leaks from the wastewater collection system in Los Laureles Canyon in Tijuana. This further exacerbates the impacts of the canyon flow diversion failures described above. Additionally, the International Collector requires rehabilitation to prevent untreated wastewater from spilling into the Tijuana River and Stewart’s Drain.



Note: For purposes of this analysis, "dry-weather" conditions indicate that the flow occurred at least five days after the most recent precipitation registered at San Diego International Airport, and the flow rate did not exceed 23 MGD. A select few flow events that exceeded the 23-MGD threshold were considered dry-weather due to either the time of year they occurred with no registered precipitation, or they varied only slightly above 23 MGD during a period that was predominantly dry-weather.

Figure 1-6. Dry-Weather Transboundary Tijuana River Flow Days per Rainfall Year (2000–2020)

Mechanical issues at the ITP can occasionally contribute to these transboundary flows. For example, a mechanical failure at Junction Box 1 (JB-1) in January 2022 restricted influent flow to the ITP, thus increasing back pressure and resulting in leakage through a deteriorated section of the International Collector in Mexico. This leak flowed through Stewart's Drain, exceeding the diversion capacity and reaching the Tijuana River in the U.S. for a period of approximately one week.

Dry-weather flows in the main channel of the Tijuana River south of the border (i.e., upstream) typically range between 20 to 30 MGD, including approximately 10 MGD of treated effluent from La Morita WWTP and Arturo Herrera WWTP and 4 to 5 MGD of flows from the Alamar River. The remainder consists of untreated wastewater and "urban drool" (i.e., unnatural, unpermitted, non-exempted dry-weather flows) (PG Environmental, 2021g). If wastewater production and discharges to the Tijuana River continue to increase from population growth and/or urbanization, future dry-weather flows will increasingly stress the operational capabilities of the diversion and pumping system in Tijuana, and the frequency, volume, and impact of transboundary river flows on the U.S. side could increase.

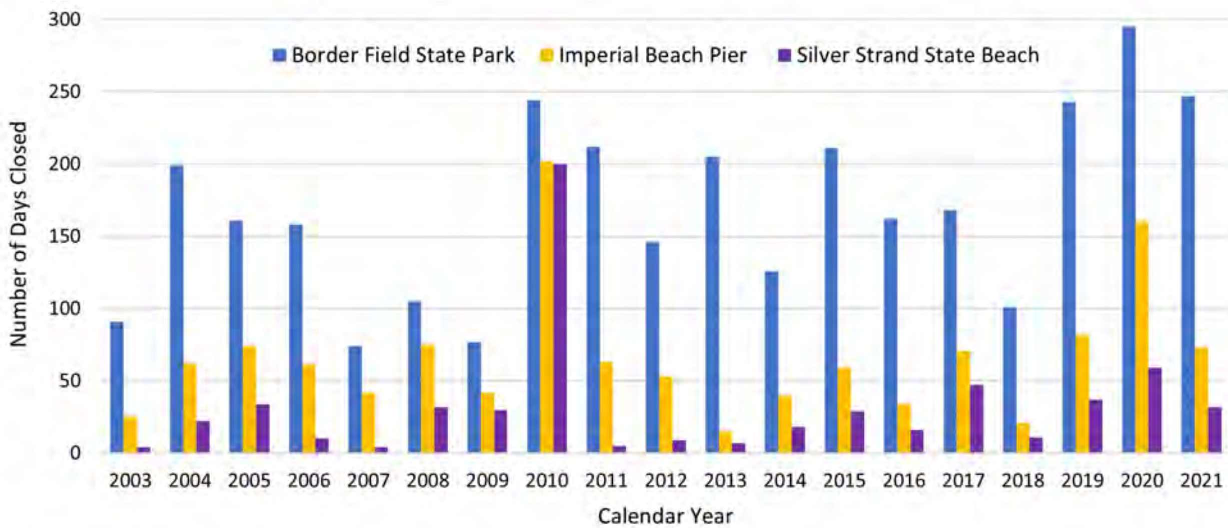
Uncontrolled trash, waste tires, and sedimentation are ongoing issues in the Tijuana River watershed. Uncontained trash and solid waste from Tijuana cause damage and increase operations and maintenance (O&M) requirements at the conveyance and treatment systems designed to mitigate transboundary flows. Unpaved roads, channel erosion, broken water mains, and erosion of disturbed areas contribute to transboundary flows of sediment via the Tijuana River and tributary canyons.

1.3.2 Impacts of Contaminated Transboundary Flows

The three primary entryways of contaminated transboundary flows from Tijuana into the U.S. are in coastal waters of the Pacific Ocean, in the Tijuana River, and in tributaries that flow north through the canyons to the Tijuana River Valley and Estuary.

Polluted transboundary maritime flows threaten the health of communities along the border and the coast, impact marine and estuarine ecosystems, damage agricultural resources, negatively impact the economy, and have the potential to limit training flexibility for U.S. military activities. See Figure 1-7 for locations of coastal communities and U.S. Navy facilities in the South Bay area. Poor coastal water quality, driven by both maritime and riverine transboundary flows, has caused frequent beach closures in southern San Diego County, particularly for the beaches closest to the U.S.-Mexico border. The beaches at Imperial Beach Pier and Border Field State Park have averaged 66 and 170 closure days per year since 2003, respectively, with even more frequent closures at Border Field State Park in recent years (averaging 262 closure days per year since 2019). Figure 1-8 depicts the annual number of beach closure days at Border Field State Park, Imperial Beach Pier, and Silver Strand State Beach from 2003 to 2021. Additionally, as discussed in Section 3.2.2 (Marine Water Quality), beach closures and warning days in southern San Diego County have significantly increased since May 2022, when the county implemented a new and more sensitive water quality monitoring method for bacteria (Elmer, 2022a). Recent ocean modeling simulations indicate that transboundary maritime flows of untreated wastewater discharged via SAB Creek at Punta Bandera pose a substantial health risk to swimmers at beaches in southern San Diego County during the dry (tourist) season (Feddersen et al., 2021). Eliminating or dramatically reducing these inflows would strongly benefit water quality and public health at beaches in the City of Imperial Beach, Silver Strand State Beach, and the City of Coronado. Poor coastal water quality also contributes to the relocation, rescheduling, and cancellation of in-water Navy training and activities (Navy Region Southwest, 2022).

Figure 1-7. Locations of Coastal Communities and U.S. Navy Facilities in the South Bay Area



Source: (City of Imperial Beach, 2022).

Figure 1-8. Annual Beach Closures in Southern San Diego County (2003–2021)

In addition to the transboundary maritime flows described above, transboundary flows in the Tijuana River and its canyon tributaries routinely bring untreated wastewater, trash, and sediment into the U.S. These contaminated flows negatively impact CBP personnel and can reach the Pacific Ocean through the Tijuana River Valley and Estuary and migrate north along the coast, compounding the impacts of coastal discharges from the Tijuana area described above. Contaminated flows from the Tijuana River, when they reach coastal areas, cause numerous beach closures, and recent ocean modeling simulations indicate that these flows pose a substantial health risk to swimmers at beaches in southern San Diego County during the wet (non-tourist) season (Feddersen et al., 2021). Untreated wastewater contributes to high bacterial concentrations in the Tijuana River and tributaries, creating health risks for recreational users, and introduces other pollutants of concern (see Section 3.1.2 [Surface Water Quality]) that have led to the Tijuana River being listed as an impaired water body under Section 303 of the CWA. Trash accumulation presents human health concerns by way of exposures to toxic substances and ponding that can encourage spread of disease vectors, diminish aesthetics, and contribute to odor issues. Sediment deposition reduces the flow capacity of the river and tidal flow exchange in the estuary. Despite repeated efforts to mitigate transboundary wastewater flows, the Tijuana River remains the most polluted river in the San Diego region (HDR, 2020a).

1.4 Purpose and Need for Action

The Proposed Action, as summarized in Section 2.2 (Proposed Action and Range of Alternatives Evaluated in This PEIS), is the funding and implementation of water infrastructure projects using U.S. appropriations, including but not limited to USMCA Implementation Act appropriations. In accordance with the CWA and the USMCA Implementation Act, the purpose and need of the Proposed Action is to reduce transboundary flows from Tijuana that convey pollutants, sewage, and/or trash into the U.S. and cause adverse public health and environmental impacts in the Tijuana River watershed and adjacent coastal areas as described in Section 1.3 (Causes and Impacts of Contaminated Transboundary Flows from Tijuana).

2.4 Alternative 1: Core Projects

For consideration in the environmental review, EPA and USIBWC have developed a solution to address transboundary flows that consists of four Core Projects identified as Projects A, B, C, and D. These four projects, in total, constitute Alternative 1 and are analyzed in detail in this PEIS. For the Core Projects, implementation would also include the mitigation and monitoring measures described in Section 5 (Mitigation Measures and Performance Monitoring).

Some components of Alternative 1 would take place in Mexico. As described in Section 2.8 (Funding Sources and Binational Agreement), binational negotiations are underway regarding the scope, funding, and implementation of projects in Mexico being contemplated as part of the USMCA Mitigation of Contaminated Transboundary Flows Project. EPA and USIBWC would move forward with funding and/or implementing projects in Mexico only if such projects have support and funding contributions from appropriate Mexican authorities.

2.4.1 Projects A, B, and C: Improve Collection and Treatment of Wastewater

Alternative 1 includes three Core Projects (Projects A, B, and C) that are intended to improve collection and treatment of wastewater from Tijuana. Project A involves expanding wastewater treatment capacity at an existing facility in the U.S. (the ITP). Projects B and C are focused on modifying and improving wastewater collection systems to ensure that more wastewater is conveyed to treatment, rather than released directly to the Tijuana River or the Pacific Ocean without treatment.

2.4.1.1 Project A: Expanded ITP

Project A includes the expansion of the 25-MGD ITP for secondary treatment of wastewater at one of three different average daily flow capacity options, 40 MGD (Option A1), 50 MGD (Option A2), or 60 MGD (Option A3); construction of a new solids processing facility; installation of other new supporting facilities; and associated site modifications. The primary purpose of expanding the ITP is to reduce impacts to the U.S. coast by treating wastewater from the International Collector that otherwise would be discharged to the Pacific Ocean via SAB Creek without adequate treatment, or any treatment at all. The expanded ITP may also reduce untreated wastewater overflows from the sanitary sewer to the Tijuana River caused by mechanical failures at PB1-B. Depending on the proposed capacity of the plant, the expanded ITP may also provide treatment for sewage collected in the canyons (Project B), as well as for additional sewage flows produced by the future population of Tijuana. Project A construction is estimated to be completed by no later than 2027.

The proposed new and expanded facilities and processes for Project A are described below. Additionally, USIBWC is in the process of initiating a plant-wide condition assessment of existing ITP components, the results of which could identify additional upgrades necessary to support expanded operations (e.g., rehabilitation of valves, junction boxes, and piping).

- **Preliminary treatment.** Upgrades would include replacing and/or installing new raw wastewater pumps to increase capacity, replacing influent screens at the ITP headworks, and renovating the existing grit chamber. Renovations to the grit chamber, depending on final design, could include installation of a more advanced automatic pump sequencing system, upgrading the grit pumps, and expanding the grit basin itself.

- **Primary treatment.** Upgrades would include installing new primary clarifiers, contiguous with and west of the existing primary clarifiers. The new clarifiers would be built to the same dimensions as the existing ones.

- **Secondary treatment.** Upgrades would include adding new biological reactors south of the seven existing reactors; constructing a new, centrally located blower building with new centrifugal blowers and decommissioning equipment in the existing blower building; installing new sludge storage tanks immediately west of the two existing sludge storage tanks; and installing new rectangular secondary sedimentation tanks south of the existing secondary settling tanks, with new pumps to support operations.

- **Discharge.** The capacity of the effluent metering pipe would increase, and treated effluent would continue to be discharged through the SBLO, which then discharges into the SBOO and then into the Pacific Ocean. Modifications to the wye diffuser array on the SBOO could be necessary to promote dispersal of the increased loadings (e.g., opening ports on existing capped risers and/or installing new diffuser heads and ports to existing closed, blind flanged risers).

- **Solids processing.** Upgrades would include new equipment to process the increased amount of solids produced by primary and secondary wastewater treatment. This would include new dissolved air flotation (DAF) units to thicken sludge from secondary treatment, new belt filter presses for additional dewatering of waste solids, expansion of the existing dewatering building to accommodate new equipment, and expansion or replacement of solids handling facilities. Project A would also incorporate anaerobic digestion of primary and secondary sludge to substantially reduce the amount of waste solids produced per gallon of wastewater treated at the ITP. Reducing solids is necessary due to anticipated logistical challenges with securing enough trucks and drivers to transport sludge offsite for disposal; however, incorporating anaerobic digestion increases the complexity of plant operations and necessitates the installation of air pollution control equipment. This could include, among other controls, installation of an electric generator to combust biogas emissions and produce electricity to offset a portion of the ITP's energy demand.

- **Other improvements.** The ITP expansion would include auxiliary facilities to provide support functions such as office space, a control room, and restrooms. This would involve constructing at least one new building and/or renovating the existing office building used by contract staff. Other improvements would include additional roads and parking within the ITP parcel; new utility connections, such as electrical (including a backup electrical generator) and communications; and expanded security fencing and lighting around the ITP.

EPA and USIBWC estimate that the treatment process at the expanded ITP would have similar removal efficiencies to those of the existing ITP—approximately 96 percent for BOD_5,[6] 68 percent for total nitrogen, 71 percent for total phosphorus, 97 percent for total suspended solids (TSS), and 99 percent for fecal coliform.

[6] BOD_5 is an indicator of the amount of organic pollution in wastewater.

Site modifications would be necessary to accommodate the new and expanded facilities. This would include providing fill material to create a level foundation for the proposed secondary reactors and clarifiers, as the areas southwest of Dairy Mart Road are approximately 10 feet lower in elevation than the rest of the ITP parcel. Fill material would be sourced from elsewhere within the Tijuana River Valley, such as the transboundary sediment deposits in Goat Canyon or Smuggler's Gulch. Other site modifications would include relocating the portion of Dairy Mart Road that crosses through the ITP parcel by demolishing it and paving a replacement road along the western boundary of the ITP parcel, and enclosing or relocating the stormwater swale that runs alongside this portion of Dairy Mart Road. Construction activities would also potentially involve temporary work (e.g., material/equipment staging and stormwater management) throughout the undeveloped 25-acre southwest quadrant of the ITP parcel and in portions of the 4-acre parcel northwest of the ITP.

The infrastructure at the expanded ITP would require regular and ongoing O&M activities to ensure operational reliability and efficiency. Additional staff members would also be required to accommodate the anticipated increase in O&M needs. As part an agreement between the U.S. and Mexico (Treaty Minute No. 283), long-term recurring operations would include hauling of sludge produced by the treatment process to Mexico for disposal. The pumps and equipment supporting the ITP would also require regular and ongoing O&M activities such as rehabilitation and replacement at varying time intervals.

Figure 2-1 provides a schematic of the proposed treatment train at the expanded ITP. Figure 2-2 depicts the anticipated general locations of project elements and construction activities for Project A. Figure 2-3 provides an example conceptual site plan of the individual facilities that would be constructed for Project A.

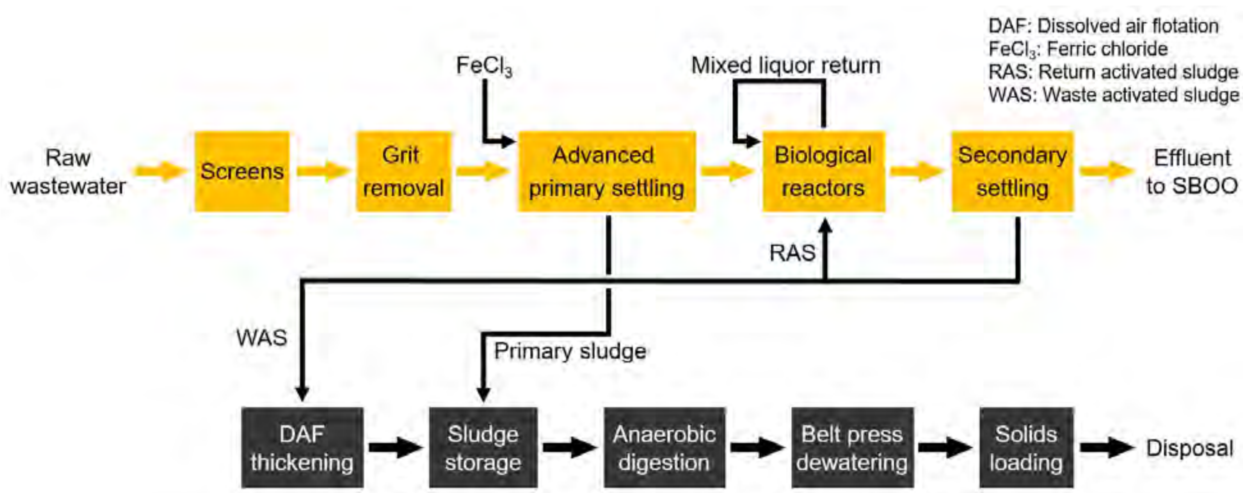


Figure 2-1. Project A (Expanded ITP) – Schematic of Expanded ITP Treatment Train

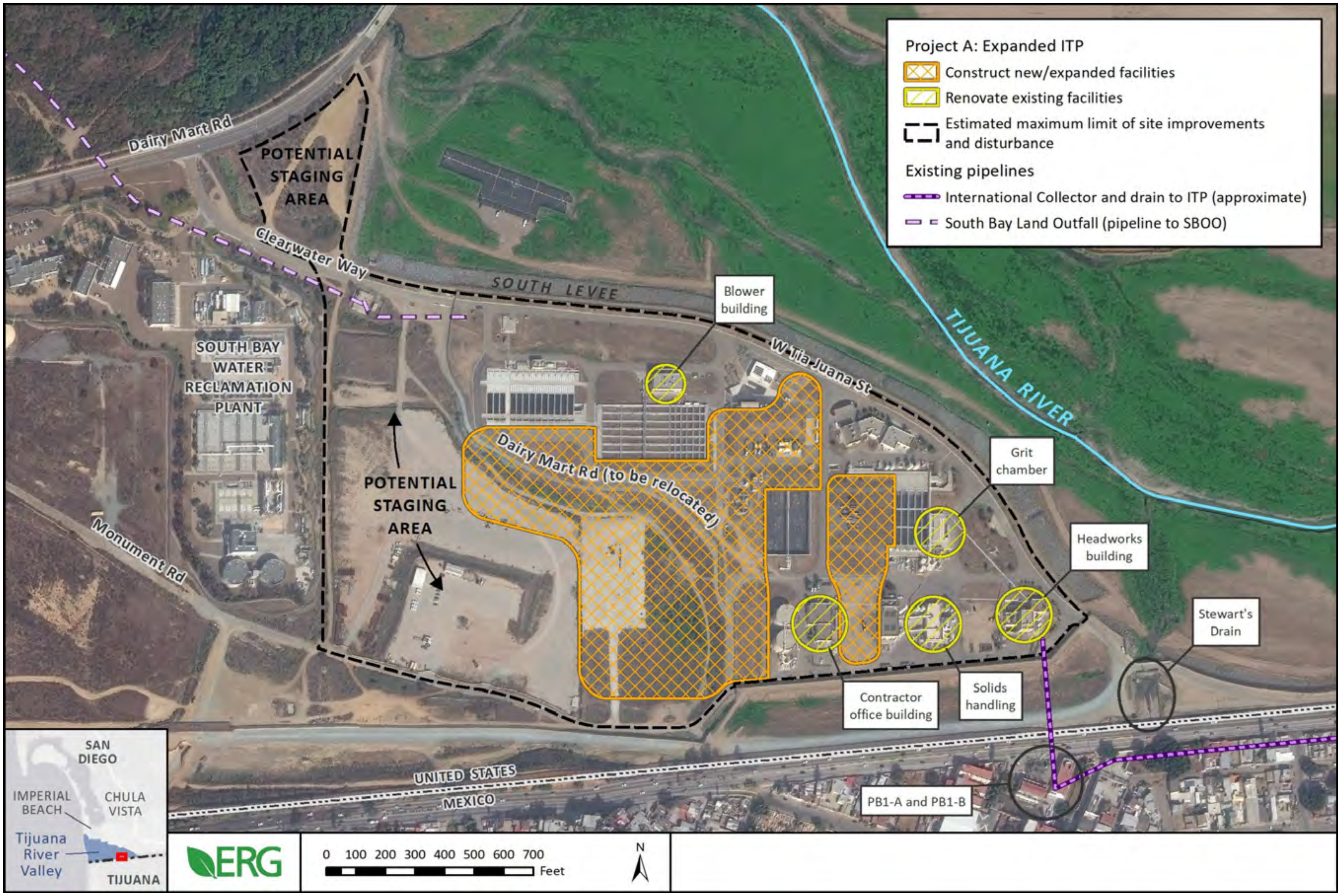


Figure 2-2. Project A (Expanded ITP) – Locations of Project Components

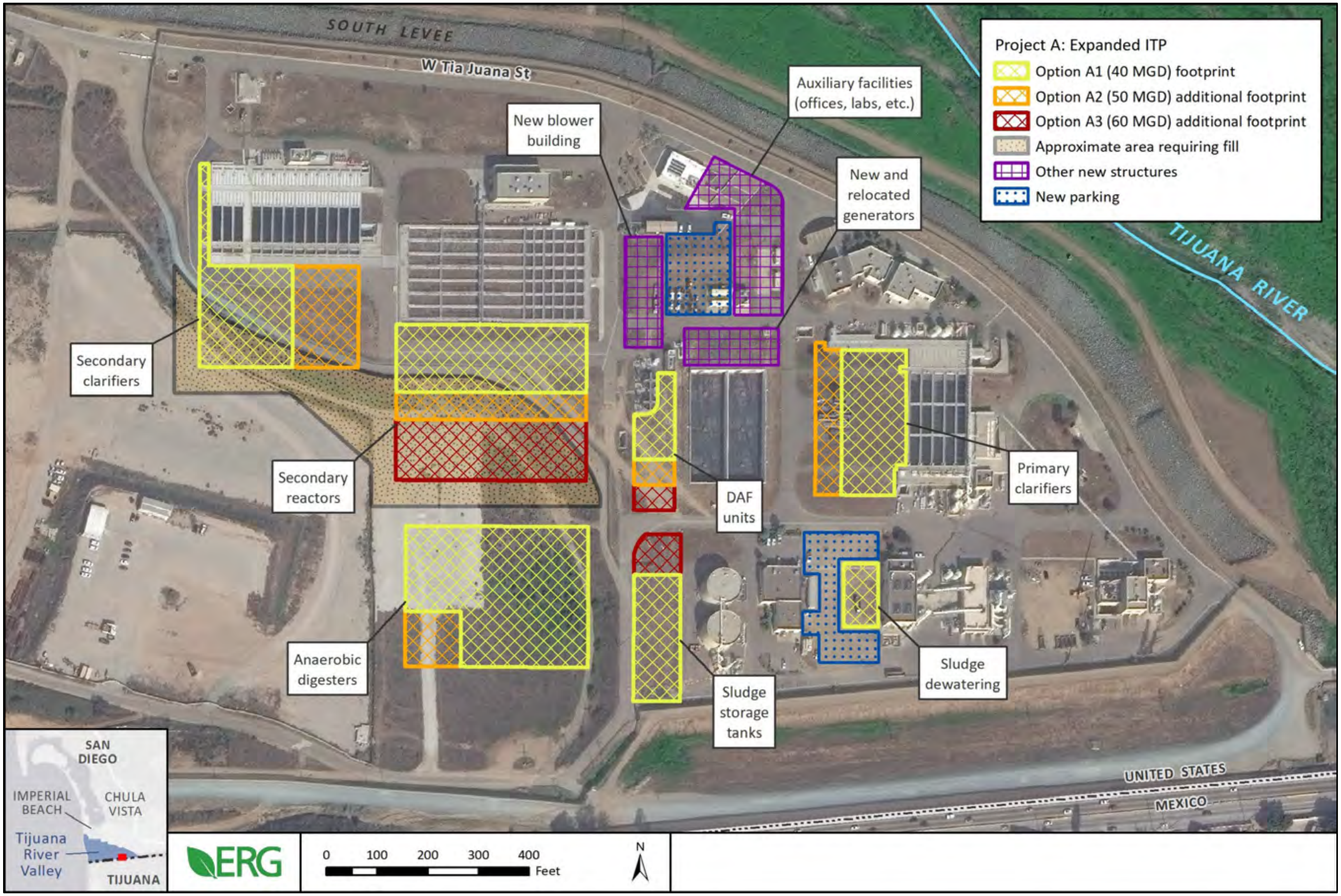


Figure 2-3. Project A (Expanded ITP) – Conceptual Site Plan of Proposed Facilities

Project A includes three proposed average daily flow capacity options for the proposed ITP expansion from the current 25-MGD capacity: Options A1, A2, and A3. The differences between the three options are summarized below and in Table 2-2.

- **Option A1: Expand to 40 MGD.** Expanding the ITP to a design treatment capacity of 40 MGD (average daily flow) would enable the plant to treat all wastewater in the International Collector and wastewater that would be collected by the rehabilitated sewer collectors in Tijuana (see Project C). However, the 40-MGD option would have minimal if any reserve capacity for future population growth.
- **Option A2: Expand to 50 MGD.** Expanding the ITP to a design treatment capacity of 50 MGD (average daily flow) would provide the same treatment capabilities as the 40-MGD option (see Option A1) while also accommodating wastewater collected in the canyons in Mexico (see Project B) and providing capacity for current and projected wastewater flows through 2030.
- **Option A3: Expand to 60 MGD.** Expanding the ITP to a design treatment capacity of 60 MGD (average daily flow) would provide the same treatment capabilities as the 50-MGD option (see Option A2) while providing capacity for current and projected wastewater flows through 2050.

The estimated capital costs for each option are shown in Table 2-2. In addition to capital costs for construction, operation of the expanded ITP would require additional recurring O&M funds. Annual O&M is funded through appropriations to USIBWC. For an expanded ITP, USIBWC would request additional resources needed for increased O&M activities as part of its annual request to the Office of Management and Budget through the Department of State.

Table 2-2. Comparison of Project A Options

Component [a]	Option A1	Option A2	Option A3
ITP treatment capacity (average daily flow)	40 MGD	50 MGD	60 MGD
ITP treatment capacity (peak daily flow)	100 MGD	100 MGD	100 MGD
New primary clarifiers (#)	5	8	8
New secondary reactors (#)	5	7	10
New centrifugal blowers (#)	5	5	6
New secondary clarifiers (#)	7	12	12
New DAF units (#)	4	5	6
New anaerobic digestors (#)	5	6	6
New sludge storage tanks (#)	2	2	3
New facility footprint, total (approximate)	400,000 SF	475,000 SF	530,000 SF
New ITP employees (#)	30	40	50
Estimated capital cost for construction [b, c]	$227 million	$299 million	$372 million

a – All scope estimates presented in this PEIS are based on feasibility-level engineering and are subject to refinement during the design process.
b – Cost estimates do not include renovations to the existing grit chambers and solids handling facilities.
c – All cost estimates were developed with an estimated accuracy of +50%/-25% for U.S.-side projects and +100%/-50% for Mexico-side projects. See Section B.7 of the Water Infrastructure Alternatives Analysis (PG Environmental, 2021f) for more information on how the cost estimates were developed.

2.4.1.2 Project B: Tijuana Canyon Flows to ITP

Project B includes the installation of a wastewater conveyance system from Matadero Canyon and Los Laureles Canyon in Mexico to the expanded ITP for treatment (see Project A for details on the ITP expansion) and associated temporary construction activities. Following treatment, these flows would be discharged to the Pacific Ocean through the SBLO/SBOO as described for Project A. Three configurations and/or installation methods of the conveyance line are being considered: trenching through Smuggler's Gulch and Monument Rd (Project B1), trenchless installation in Smuggler's Gulch and under the mesa (Project B2), and connection to the existing canyon collector system (Project B3). The primary purpose of the proposed conveyance system is to reduce the amount of dry-weather wastewater flows that are currently discharged with little to no treatment to the Pacific Ocean via SAB Creek. As a secondary benefit, Project B would potentially reduce the volume and frequency of dry-weather transboundary flows in Goat Canyon and Smuggler's Gulch by eliminating the reliance on pump stations whose mechanical issues may cause occasional wastewater overflows into the canyons in Mexico (see Section 1.3 [Causes and Impacts of Contaminated Transboundary Flows from Tijuana]).

Up to 12.7 MGD (peak daily) of wastewater from the canyons would be collected by the new conveyances and transported to the ITP for treatment. The current wastewater flow from the canyons is 6.3 MGD, so the new conveyances would have available capacity to accommodate flow increases over time.

The new wastewater conveyance system would include new pipelines (Reaches 1–4) in Mexico that use gravity to convey wastewater to the U.S., which would eliminate reliance on the existing pump stations in the canyons—specifically, the Matadero pump station in Matadero Canyon and the Los Laureles 1 and Los Laureles 2 pump stations in Los Laureles Canyon.[7] The new Reach 5 pipeline in the U.S. is described later in this section. The new conveyance lines in Mexico would consist of the following:

- **Reach 1:** A 15-inch nominal diameter gravity sewer that would flow directly east from the Los Laureles 2 pump station and connect to Reach 2. Reach 1 would be approximately 2,000 feet long, would pass underneath the high ground between the two canyons, and would be installed using directional drilling.
- **Reach 2:** A 15-inch nominal diameter gravity sewer that would flow generally north from the eastern end of Reach 1 to the Matadero pump station. Reach 2 would be approximately 1,700 feet long and would be installed using conventional open-cut trenching methods.
- **Reach 3:** A 21-inch nominal diameter gravity sewer that would flow generally north along Matadero Canyon from the Matadero pump station until it intersects Reach 4 approximately 150 feet south of the border. Reach 3 would be about 3,500 feet long and would be installed using conventional open-cut trenching methods (except for approximately 700 feet passing beneath the International Highway, which would be installed using micro-tunneling).
- **Reach 4:** A 15-inch nominal diameter gravity sewer that would flow generally east from the Los Laureles 1 pump station until it intersects with Reach 3. Reach 4 would be

[7] These three pump stations would remain in place as backup to pump flows from the canyons to SABTP or SAB Creek in the unlikely case of failure of a Project B pipeline in the U.S.

approximately 4,000 feet long, would pass beneath the high ground between the canyons, and would be installed using directional drilling.

The sections of the proposed conveyance line that would be installed using open-cut trenching (Reach 2 and a part of Reach 3) would occur in undeveloped areas in Matadero Canyon and would require temporary land disturbance and lighting along the proposed route during construction, as well as for staging areas. The sections of the proposed conveyance line that would be installed using micro-tunnelling or directional drilling (Reach 1, 4, and part of Reach 3) would require temporary pits at each end of the micro-tunnel or drilling location with construction staging areas to feed the pipe sections underground. The construction areas on each side of the micro-tunnel or drilling operation would require temporary fencing, lighting, a truck-mounted generator to run equipment, and other construction equipment. The pipes would have shallow installation, so dirt would be backfilled following installation.

In the U.S., Project B includes three proposed configurations of Reach 5 to convey flows from the end of Reach 4 to the expanded ITP: Options B1, B2, and B3. The differences between the three options are summarized below.

- **Reach 5, Option B1: Trenching via Smuggler's Gulch and Monument Road.** Option B1 includes installing Reach 5 using open-cut trenching methods through Smuggler's Gulch and along Monument Road. Reach 5 would consist of a 24-inch nominal diameter force main that would run from 150 feet south of the border in Matadero Canyon to the headworks of the ITP. This sewer would run north beneath the border for approximately 1,000 feet; north under the Smuggler's Gulch access road for approximately 1,300 feet; east under Monument Road for approximately 6,100 feet; and east/southeast adjacent to Clearwater Way and West Tia Juana Street for approximately 3,600 feet before reaching the headworks of the ITP.

  Reach 5 would be installed using conventional open-cut trenching methods except for the section beneath the U.S.-Mexico border, which would be installed using micro-tunneling. Temporary pits would be required at each end of the micro-tunnel section and may require additional security during construction due to their proximity to the border. Depending on the results of utility surveys, open-cut trenching would be confined to the existing roadway in Smuggler's Gulch and along Monument Road and would be confined to the undeveloped strip of land adjacent to Clearwater Way and West Tia Juana Street. Unvegetated areas would be used for construction staging activities, as necessary.

- **Reach 5, Option B2: Trenchless Installation via Smuggler's Gulch and Under Mesa**. Option B2 includes installing Reach 5 using a combination of open-cut trenching and trenchless methods to avoid or minimize disturbances within Smuggler's Gulch and along Monument Road. Reach 5 would be a 24-inch nominal diameter polyvinyl chloride (PVC) force main that starts 150 feet south of the border and runs approximately 1,000 feet north into Smuggler's Gulch; east underneath the mesa for approximately 5,000 feet; and east/southeast along Dairy Mart Road, Clearwater Way, and West Tia Juana Street for approximately 4,500 feet before reaching the headworks of the ITP.

  The sections of Reach 5 underneath the border, Smuggler's Gulch, and the mesa between Smuggler's Gulch and the ITP would be installed using directional drilling. These sections would require three temporary pits: one located 150 feet south of border in Smuggler's Gulch, one located approximately 900 feet north of the border in Smuggler's Gulch (adjacent to the canyon flow diversion structure), and one located near the intersection of Dairy Mart Road and Monument Road. The temporary construction pits in Smuggler's Gulch may require additional security during construction due to their proximity to the border. Open-cut trenching would be used for the final section to the ITP headworks (identical to that for Option B1).

- **Reach 5, Option B3: Connect to Existing Canyon Collector System**. Option B3 includes installation of Reach 5 beneath the border to connect to the existing canyon collector pipeline in Smuggler's Gulch (part of the existing canyon collector system described in Section 1.2 [Existing Diversion and Treatment Infrastructure]) for conveyance to the ITP. This option would minimize disturbances and leverage existing infrastructure. Reach 5 would be a 24-inch nominal diameter high-density polyethylene (HDPE) gravity pipe that runs north beneath the border for approximately 1,000 feet and connects to the existing 30-inch gravity sewer ("canyon collector") that currently conveys flows from the Smuggler's Gulch canyon flow diversion structure to the Hollister Street pump station. The existing equipment at the pump station would be used to pump these combined flows (from Reach 5 and the U.S.-side canyon flow diversion structures) to the ITP using the existing 16-inch and 30-inch force mains.[8]

  Reach 5 would be installed using micro-tunnelling underneath the border. The U.S.-side micro-tunnelling pit would also be used to connect Reach 5 to the existing canyon collector. Temporary pits would be required at each end of the micro-tunnel section and may require additional security during construction due to their proximity to the border.

The estimated capital costs for Project B are $30.8 million, $44.7 million, and $22.3 million for Options B1, B2, and B3, respectively. Project B construction activities, including components in Mexico, are projected to take approximately two years to complete following mobilization but the specific schedule for starting and completing construction is not known at this time.

The infrastructure proposed for Project B would be expected to require regular and ongoing O&M activities to ensure operational reliability and efficiency. Maintenance on the U.S. side would generally consist of inspecting the ground along the sections of pipe installed using open-cut trenching to look for potential leaks. The new conveyance pipelines would use gravity to transport wastewater; therefore, minimal mechanics would be involved, reducing the overall maintenance requirements. Maintenance of the new gravity pipelines in Mexico would generally consist of routine CCTV inspections, cleaning, and leak repairs. Binational negotiations regarding O&M responsibilities and funding for Project B are ongoing.

Figure 2-4, Figure 2-5, and Figure 2-6 depict the anticipated general locations of project elements and construction activities for Options B1, B2, and B3, respectively, of Project B.

[8] Depending on the results of the USIBWC condition assessment of existing ITP components, the scope of Option B3 could also include rehabilitation of the Hollister Street pump station and associated force mains. However, this PEIS does not evaluate impacts of extensive rehabilitation of the force mains (e.g., impacts of open-trench rehabilitation or replacement of the force mains). If EPA and USIBWC select Option B3 and determine that extensive rehabilitation of the force mains is necessary, resulting in impacts that could be significant and that are not documented in this PEIS, this would require a supplemental NEPA review (and associated public engagement) to assess impacts to the properties that would be affected by rehabilitation activities.

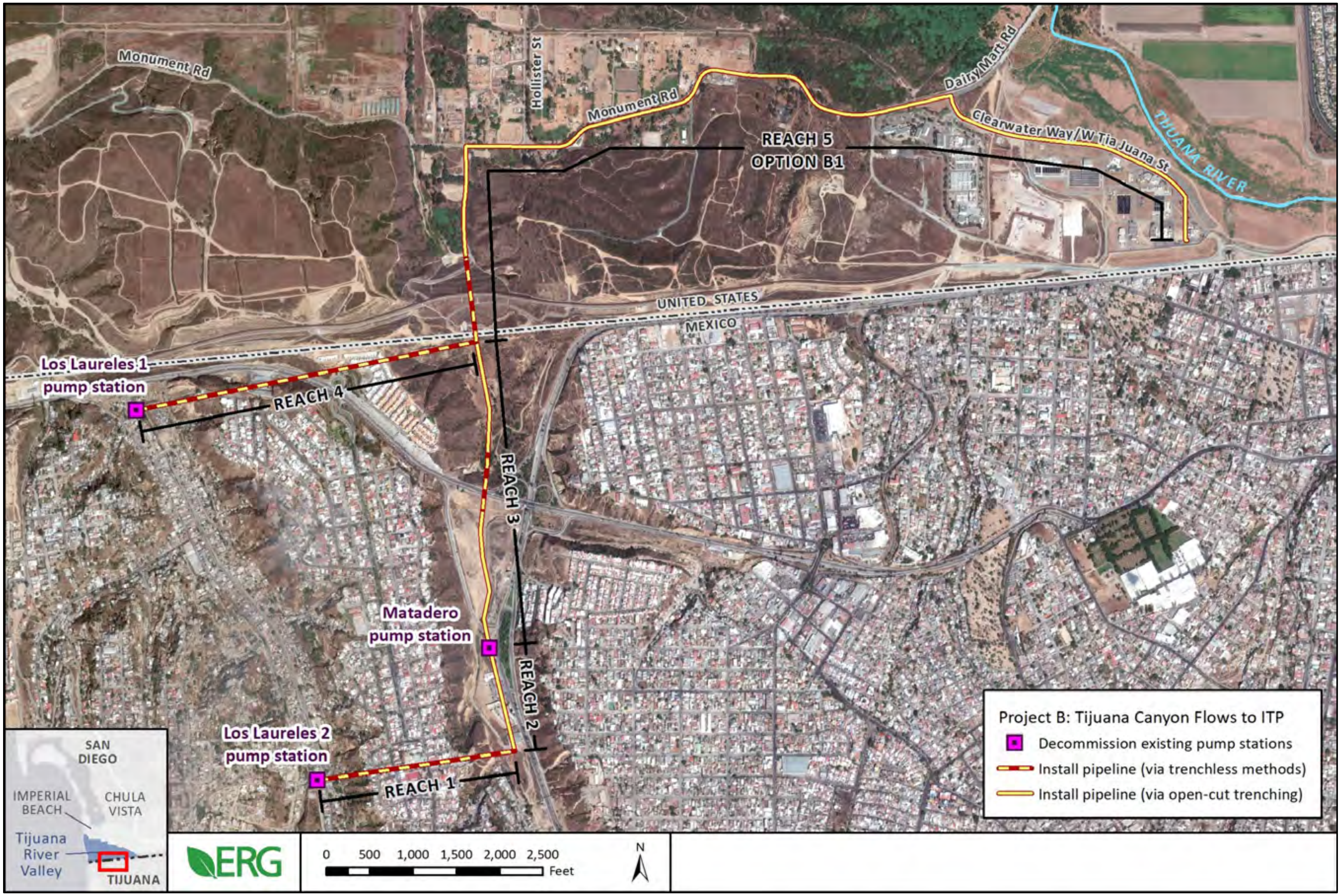


Figure 2-4. Project B (Tijuana Canyon Flows to ITP), Option B1 – Locations of Project Components

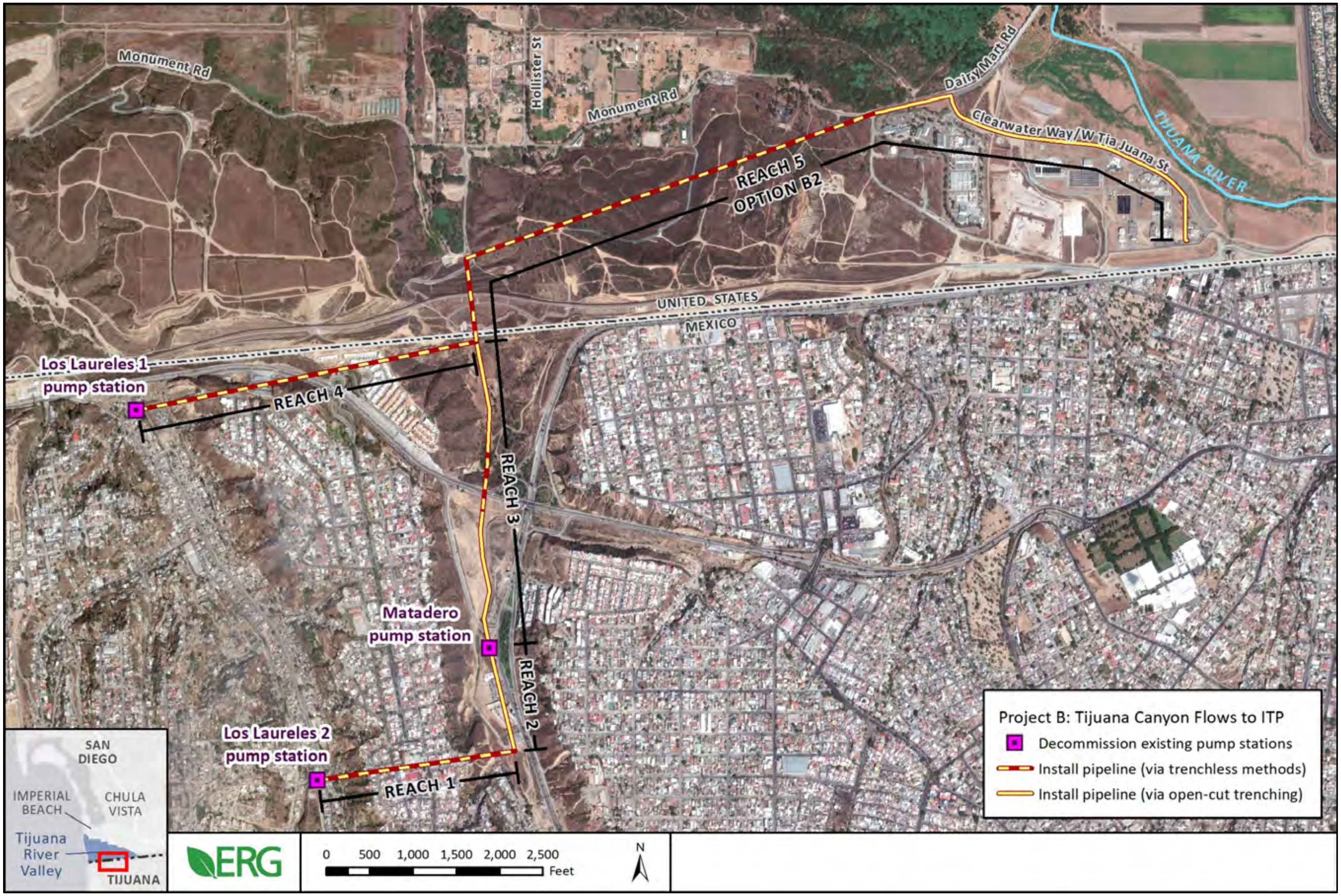


Figure 2-5. Project B (Tijuana Canyon Flows to ITP), Option B2 – Locations of Project Components

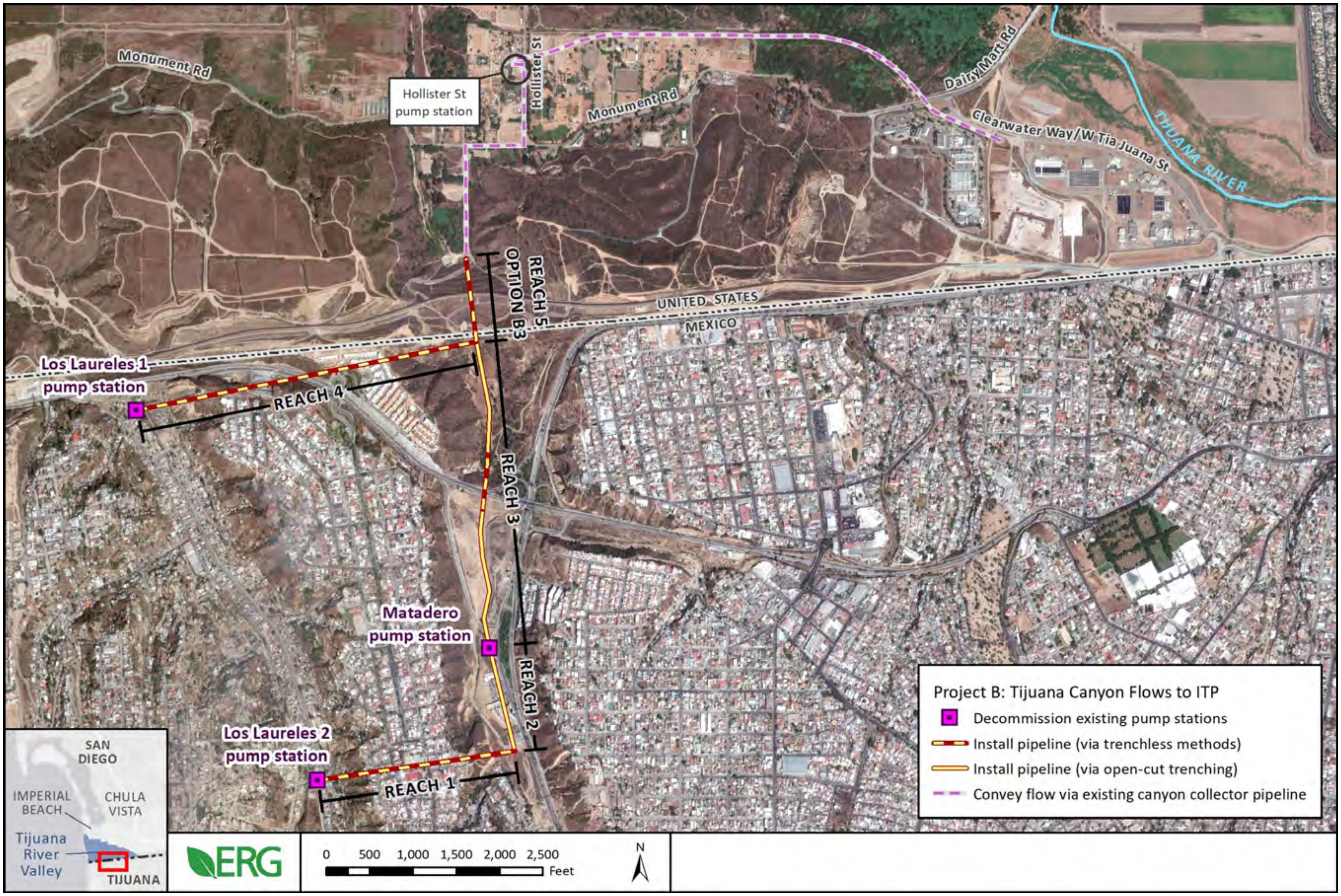


Figure 2-6. Project B (Tijuana Canyon Flows to ITP), Option B3 – Locations of Project Components

2.4.1.3 Project C: Tijuana Sewer Repairs

Project C includes rehabilitating or replacing targeted sewer collectors in the Tijuana metropolitan area in order to reduce the amount of untreated wastewater that currently leaks from the sanitary sewer system in Tijuana and enters the Tijuana River. By reducing wastewater leaks to the river in Tijuana, Project C would improve downstream water quality in the Tijuana River Valley and Estuary by both 1) reducing overall river flow volumes, and thus reducing the frequency of dry-weather transboundary flows caused by river flow rates that exceed the PB-CILA diversion capacity, and 2) ensuring that more wastewater in the Tijuana sewer system is successfully conveyed to the expanded ITP for treatment (see Project A) rather than entering the U.S. as a transboundary flow.

CESPT and CONAGUA, with concurrence from EPA and USIBWC, have identified seven sewer collectors to be rehabilitated or replaced using USMCA, BWIP, and/or Mexico funds as a Core Project under this PEIS. Most of the improvements would include replacement of old concrete pipes with new pipes made from more durable material (e.g., PVC or HDPE) to prevent the risk of leaks and collapses. Most of these collector rehabilitation and replacement projects, listed in Table 2-3, were selected with the goal of reducing existing wastewater leaks to the Tijuana River down to 5 MGD.[9] One project (Force Main Antiguo, project #7) was selected with the goal of reducing transboundary wastewater leaks that reach the U.S. and the Tijuana River via Los Laureles Canyon and Matadero Canyon. Figure 2-7 depicts a schematic of the wastewater collection system in Tijuana and the project locations.

Construction activities for rehabilitation or replacement of these sewer collectors would include the use of heavy construction equipment and open-cut trenching in most locations. In some cases (e.g., when sections of pipelines are particularly deep or would cross busy roadways), trenchless methods would be used. The targeted sewers are located in urban, developed areas predominantly within existing streets.

The estimated capital costs are $59 million for the targeted collector repairs. Project C construction activities are projected to take approximately one to three years to complete (per individual project) following mobilization but the specific schedule for starting and completing construction for all collector repairs is not known at this time. See Section 2.8 (Funding Sources and Binational Agreement) for more information about funding sources and O&M responsibilities for this project.

The sewer collector repair projects listed in Table 2-3 include current projects having priority for rehabilitation or repairs. While Mexico has the prerogative to modify the list to prioritize other repair projects, any such modifications to the list of projects would preserve the overall goal of reducing existing wastewater leaks to the Tijuana River down to 5 MGD. This would ensure that the transboundary impacts and improvements are similar to those of the projects listed in Table 2-3.

[9] In addition to the projects identified in Table 2-2, EPA is planning to provide BWIP funding for separate efforts (pursuant to separate NEPA reviews) that also would perform priority repairs to sewer infrastructure in Tijuana. See Section 2.9 (Related Projects).

Table 2-3. Tijuana Sewer Collectors Included in Project C for Rehabilitation or Replacement

ID Number	Name	Description	Length to Be Rehabilitated (feet)	Existing Pipe	Proposed Pipe
Projects to Reduce Wastewater Leaks to Tijuana River in Mexico					
1	International Collector (Phase 2) [a]	Rehabilitate International Collector piping using trenchless methods due to location along a major highway.	8,200	72-inch concrete	72-inch PVC SPR (PVC spiral inside concrete pipe)
2	Rehabilitation of Insurgentes Collector	Replace Insurgentes Collector piping.	18,400	36-inch concrete	36-inch PVC
3	Rehabilitation of Poniente Collector (missing sections in col. 20 de Noviembre)	Rehabilitate Poniente Interceptor pipeline, which is old, at risk of collapse, and causes major spills and wastewater discharges to the Tijuana River.	2,300	42-inch concrete	42-inch and 48-inch PVC
4	Rehabilitation of Collector Carranza	Replace Carranza Collector piping in Colonia Carranza.	9,200	36-inch concrete	36-inch PVC
5	Rehabilitation of Interceptor Oriente	Replace the Oriente Collector in the eastern section of the Tijuana River.	22,800	42- and 48-inch concrete	42-inch and 48-inch PVC
6	Tijuana River Gates	Replace piping along the Alamar and Tijuana River wastewater collection system to reduce untreated wastewater discharges to the Tijuana River.	23,300	8- to 60-inch concrete	8-inch to 60-inch PVC
Project to Reduce Wastewater Leaks to Los Laureles Canyon and Matadero Canyon in Mexico					
7	Force Main Antiguo	Rehabilitate the force main section of the old conveyance from PB1 to SABTP.	14,400	42-inch steel core concrete	42-inch steel or PVC pipe

a – Phase 1 of the International Collector repairs, which includes construction of new alternative piping through the streets of Tijuana using 60-inch PVC, is being funded through BWIP and received a Categorical Exclusion in March 2022 to complete its NEPA review.

Figure 2-7. Project C (Tijuana Sewer Repairs) – Schematic of Tijuana Sewer Collectors for Rehabilitation or Replacement

2.4.2 Project D: APTP Phase 1

Project D includes the construction and operation of a 35-MGD Advanced Primary Treatment Plant (APTP) for advanced primary treatment of diverted water from the existing PB-CILA diversion in Mexico, rehabilitation and extension of the existing force main from PB-CILA to the new APTP, installation of other new supporting facilities, and associated site modifications. The primary purpose of Phase 1 of the proposed APTP is to reduce impacts to the U.S. coast by treating diverted river water that otherwise would be discharged to the Pacific Ocean via SAB Creek without adequate treatment, or any treatment at all. This project would also reduce the frequency of transboundary river flows by eliminating the use of a pump station (PB1-A) whose mechanical issues indirectly cause occasional shutdowns of the PB-CILA diversion (see Section 1.2 [Existing Diversion and Treatment Infrastructure]).

The APTP would operate independently of the existing ITP and would consist of the following treatment processes: screening, aerated grit removal, grit dewatering, a ballasted flocculation process, and sludge handling. Figure 2-8 provides a schematic of the treatment train at the proposed APTP.

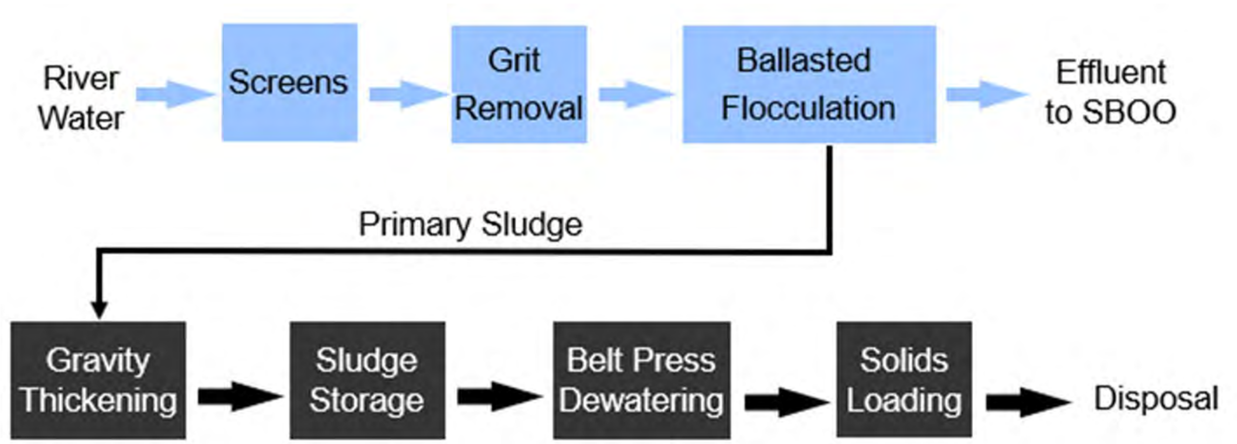


Figure 2-8. Project D (APTP Phase 1) – Schematic of APTP Treatment Train

The proposed 35-MGD APTP for Project D, which represents Phase 1, would be designed and constructed to allow for potential expansion under Phase 2. For example, concrete pads constructed under Phase 1 for ballasted flocculation, sludge storage, and other process units would be large enough to accommodate the potential installation of additional process units under Phase 2, and piping and stub-outs to convey flows between the units would be sized to accommodate the flow rates of a 60-MGD plant. While these expanded pads would not specifically support operation of the 35-MGD plant, this approach is necessary to ensure soil and foundation stability for the overall plant and to ensure that the siting of Phase 1 infrastructure does not inadvertently prevent potential future expansion under Phase 2. See Section 2.5.2.1 (Project E: APTP Phase 2) for additional information on the proposed Phase 2.

The proposed new facilities and processes for Project D are described below.

- **Preliminary treatment.** The preliminary treatment process would include conveying influent from the headworks through self-cleaning bar screens and an aerated grit removal tank. The screening process would protect the advanced primary treatment process from large solid waste, and the grit chambers would remove approximately 25 percent of the suspended solids from river water.

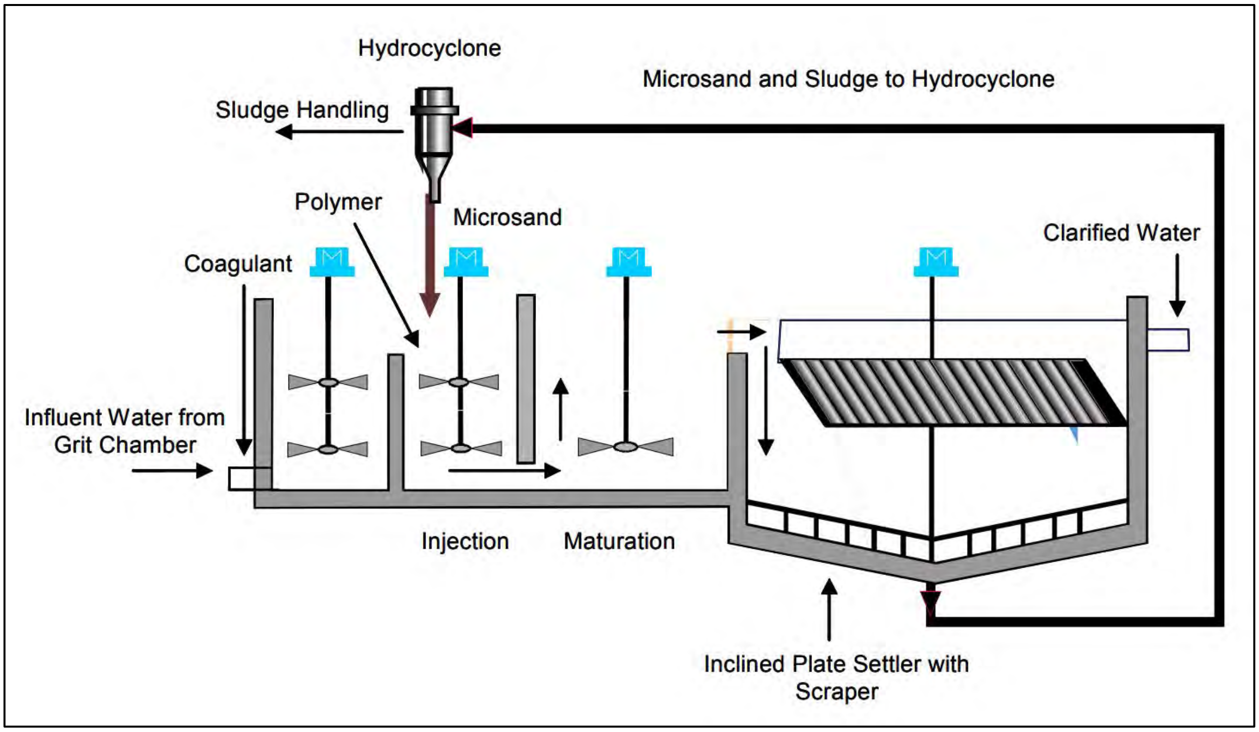
- **Primary treatment.** The APTP would include a ballasted flocculation treatment process. Ballasted flocculation is a physical chemical treatment process that uses recycled media, coagulants, and polymers to improve the settling properties of suspended solids. Two ballasted flocculation treatment trains would be constructed, each with a 25-MGD design capacity. A flow schematic of the ballasted flocculation process is shown in Figure 2-9.

- **Discharge.** Treated effluent from the ballasted flocculation process would be conveyed through a new 300-foot pipeline located within the ITP parcel to tie into the existing ITP effluent structure and then discharged through the SBLO, which then discharges into the SBOO and then into the Pacific Ocean. Modifications to the wye diffuser array on the SBOO could be necessary to promote dispersal of the increased loadings (e.g., opening ports on existing capped risers and/or installing new diffuser heads and ports to existing closed, blind flanged risers).

- **Solids processing.** The APTP would include solids handling facilities to process the grit and sludge removed from the river water. The sludge handling process would include gravity thickening, sludge storage, and dewatering units. The sludge loading facilities would include conveyors and hoppers to load the sludge onto trucks to be hauled offsite for disposal.

- **Other improvements.** The new APTP would include facilities for offices, a control room, and restrooms to support operations. These facilities would potentially be co-located with similar proposed support facilities at the expanded ITP (Project A). The existing blower building at the ITP would be repurposed to house the controls for the APTP process. Electrical upgrades to the current system, including additional backup power, would support the pumps and equipment for the proposed APTP. The APTP site is enclosed by the existing ITP fence, but additional or upgraded lighting would potentially be required.

EPA and USIBWC estimate that the treatment process at the APTP would have removal efficiencies of approximately 50 percent for BOD_5, 13 percent for total nitrogen, 85 percent for total phosphorus, 89 percent for TSS, and 95 percent for fecal coliform.



Source: (EPA, 2003).

Figure 2-9. Ballasted Flocculation Process Flow Schematic

Site modifications for the proposed APTP would be necessary and would include grading and land disturbance for siting of the proposed APTP (shown in Figure 2-10) on the northern edge of the ITP property and for construction staging areas within the ITP parcel. The proposed APTP would be constructed in the north area of the ITP parcel, immediately north of the ITP secondary treatment units and south of West Tia Juana Street. Construction activities would also potentially involve temporary work (e.g., material/equipment staging and stormwater management) throughout the undeveloped 25-acre southwest quadrant of the ITP parcel.

In order to convey river water to the new APTP, the existing PB-CILA diversion in Mexico (which would operate when the instantaneous river flow rate is 35 MGD or less) would convey diverted river flows through an existing force main across the border to the APTP headworks. Project D would include the rehabilitation and extension of this existing force main from PB-CILA in Mexico to the new APTP in the U.S. PB-CILA currently conveys diverted river water to PB1-A through a 42-inch force main. This line would be rehabilitated and extended to direct flows from PB-CILA to the headworks of the new APTP, thus bypassing PB1-A. The section of the line proposed for rehabilitation runs from PB-CILA to Avenue M in Tijuana and is approximately 7,200 feet long. Rehabilitation of this section of existing pipe would involve installing mechanical joint restraints and applying corrosion protection. A new section of 42-inch HDPE force main, approximately 800 feet in total length, would be installed (using micro-tunneling) under the border from the PB1-A site in Mexico to a location west of Stewart's Drain on ITP property in the U.S. Finally, open-cut trenching in the U.S. would be used to construct an approximately 1,800-foot section of new 42-inch HDPE force main north to West Tia Juana Street and then to the headworks of the new APTP.

Rehabilitating and extending the existing force main line would involve temporary land disturbance during construction in both Tijuana and in the U.S. within the ITP parcel. In Tijuana, temporary pumps would re-route flow between PB-CILA and PB1-A while this portion of the force main is rehabilitated, and temporary fencing and lighting would be constructed to increase security and support operations. Micro-tunneling under the U.S.-Mexico border would require temporary pits at both ends, and open-cut trenching would involve land disturbance and additional lighting. A temporary shutdown of PB-CILA or bypass of the force main (e.g., by sending diverted river flows to the International Collector) would be necessary to allow for connection of the rehabilitated and new force main sections.

The proposed APTP would require regular and ongoing O&M activities to ensure operational reliability and efficiency. Approximately 30 additional staff members would be required to accommodate the anticipated increase in O&M needs. Long-term recurring operations would include hauling of solids produced by the treatment process to a local solid waste disposal site. The pumps and equipment supporting the APTP would also require regular and ongoing O&M activities such as rehabilitation and replacement at varying time intervals.

The estimated capital costs are $76.6 million for the 35-MGD APTP and $11.5 million for the force main rehabilitation and extension. Project D construction activities, including components in Mexico, are projected to take approximately two years to complete following mobilization but the specific schedule for starting and completing construction is not known at this time. Binational negotiations regarding O&M responsibilities and funding for Project D are ongoing.

Figure 2-10 and Figure 2-11 depict the anticipated general locations of project elements and construction activities for Project D. Figure 2-12 provides an example conceptual site plan of the individual facilities that would be constructed for Project D.

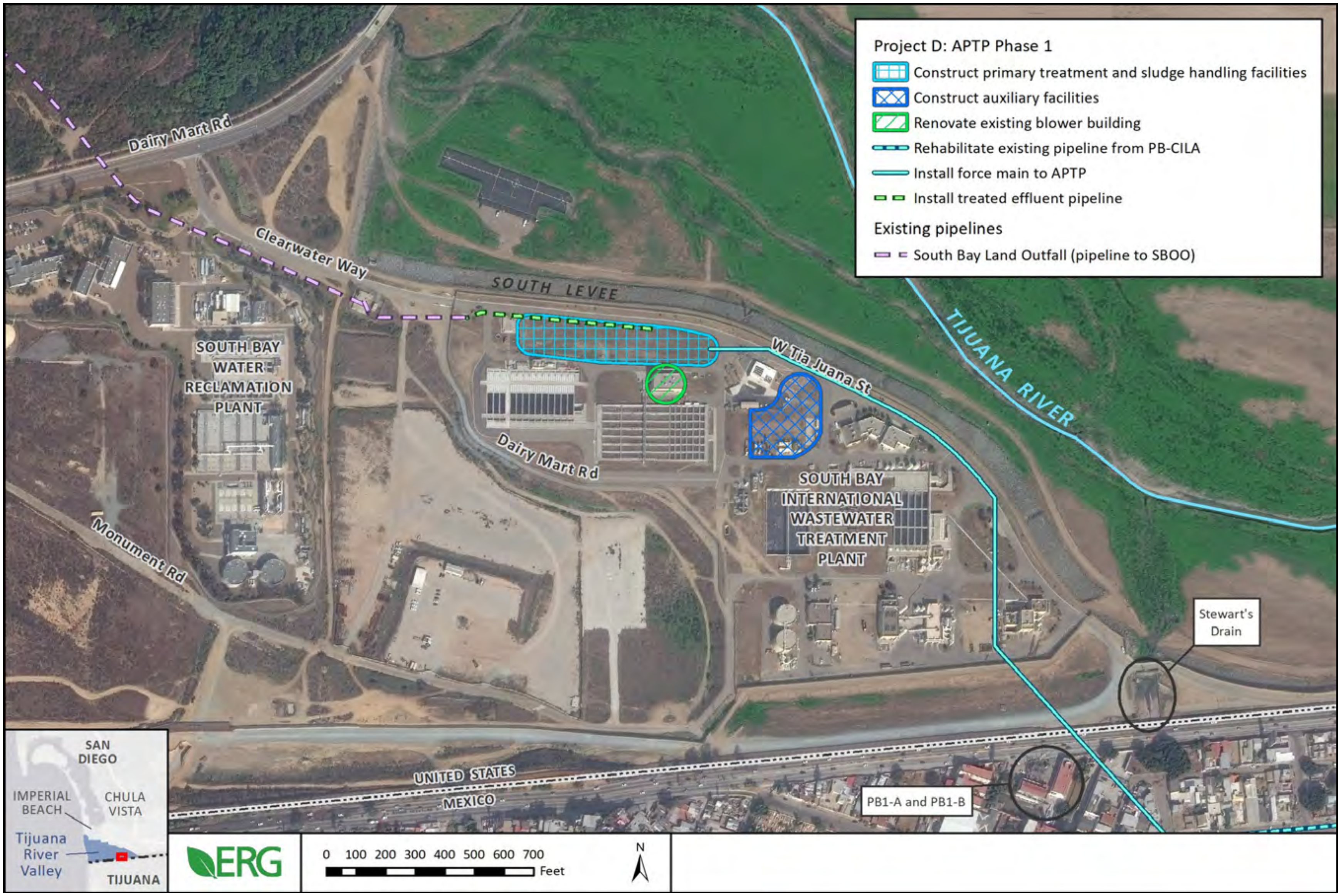


Figure 2-10. Project D (APTP Phase 1) – Locations of Project Components (1 of 2)

Figure 2-11. Project D (APTP Phase 1) – Locations of Project Components (2 of 2)

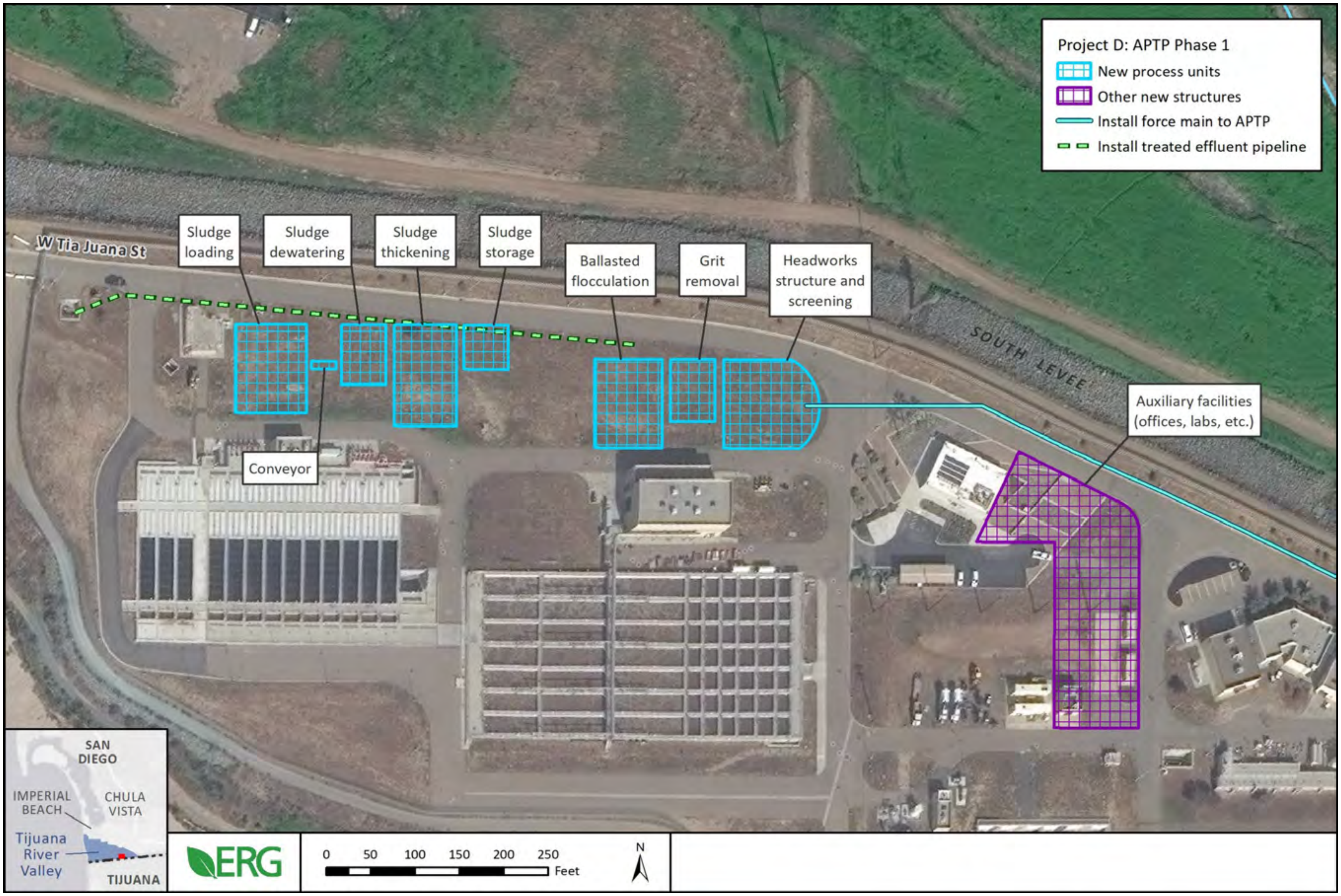


Figure 2-12. Project D (APTP Phase 1) – Conceptual Site Plan of Proposed Facilities