Tijuana River Valley
Needs and Opportunities Assessment

Appendix I. Project Alternative Cut Sheets for Alternatives A-C, D, K, and L/M

March 13, 2020

Alternatives A-C

Projects 3 & 4 (Options a-c): NEW LIFT STATION TO DIVERT TIJUANA RIVER FLOWS TO SOUTH BAY INTERNATIONAL WASTEWATER TREATMENT PLANT (SBIWTP) AND NEW STORMWATER TREATMENT FACILITY AT SBIWTP

DESCRIPTION


Project 3


Project 4

Diversion of up to 163 mgd wet weather flows from the Tijuana River mainstem to a new Stormwater Treatment Facility at SBIWTP for Advanced Primary Treatment and discharge to deep ocean outfall through the South Bay Ocean Outfall (SBOO). Wet weather flows would go to the new treatment plant while the dry weather flows would continue to be routed to the existing treatment plant.

POTENTIAL BENEFITS

Reduces the number of unaddressed average annual transboundary flow days from 138 to: Option a - 56 (61% reduction); Option b - 20 (84% reduction); or Option c - 12 (91% reduction)

EST. ONE-TIME COST

Construction	Design
Option a: $66M	Option a: $8M
Option b: $146M	Option b: $17M
Option c: $205M	Option c: $21M

Env./Permitting

Options a-c: $4M

EST. ONGOING COST

Annual O&M Per Year

Option a: $1.9M; Option b: $2.9M; Option c: $4.5M

Annual Environmental Monitoring for 10 Years

Options a-c: $10M

PROS (+)

- Captures flows and spills not captured upstream in Mexico
- Reduces impacts to downstream river, estuary, and beaches
- Provides new treatment facility for additional captured storm flows
- Provides advanced primary treatment of flows from small rain events (up to 163 MGD)
- Utilizes existing available space at IBWC SBIWTP
- Minimizes environmental impacts as the site is located within the current treatment facility boundary and utilizes the existing SBOO

CONS (-)

- Provides limited capacity to divert flows during rainy season (less than 1-year rain event)
- Requires ongoing maintenance to be effective
- Requires significant environmental analysis and permitting
- Requires construction of new treatment plant
- Requires significant annual maintenance
- Complex operation would require additional staff at SBIWTP to operate facility

ADDITIONAL INFORMATION

- NADB Diversion Study has evaluated the construction of a new diversion facility to primarily address flows that occur during dry weather (maximum diversion of 35 MGD)
- NADB Diversion Study proposes expanding the existing SBIWTP capacity to 35 MGD for additional dry and/or wet treatment capacity (primary treatment only)
- Max additional treatment is driven by the available peak capacity in the South Bay Ocean Outfall of 233 mgd and the permitted discharge of 40 mgd granted to SBWRP (233-40 = 193 mgd)
- Max treatment is further reduced by 30 mgd (163 mgd max) to allow for existing SBIWTP capacity
- Building a new treatment facility can be accommodated on federally owned land adjacent to the existing SBIWTP
- A separate treatment plant is preferred that does not combine stormwater flows with influent to the existing treatment plant to maintain integrity of the existing treatment process
- Would require modification of the SBIWTP NPDES Discharge Permit

EVALUATION MATRIX

IMPLEMENTATION AND O&M			ENVIRONMENTAL		COMMUNITY / SOCIETAL			
Technical Feasibility	Operating Complexity	Sustainability (i.e., energy usage)	Impact to Habitat (River Valley)	Impact to Habitat (Ocean)	Environmental Justice	Ancillary Community Benefits	Limited Community Disruption	Public Support
●	●	●	●	●	●	●	●	●
• Construction is straightforward • May have some environmental permitting challenges • All construction to occur within existing treatment facility boundary • Construction is simplified with new treatment facility not connected to the existing treatment facility • Fewer unknowns as related to the site; sub-surface and geotechnical info should be readily available	• Potential for remote operation • No security concerns for CBP • Not dependent on upstream or downstream processes • Requires complex operation and high annual maintenance • Quality of effluent depends on process efficiency • Allows operational flexibility with a new treatment facility separate from the existing plant • No issues accessing site during storms or inclement weather	• Can implement sustainable construction with moderate level of success • Requires high power consumption but can be offset using alternative power source • Requires high chemical usage • Requires high manpower for O&M	• Construction within an existing treatment facility results in minimal impacts to sensitive habitats	• Provides treatment and discharge through the SBOO which minimizes impacts to coastal and estuarine habitats	• No new impacts created that may affect low- to moderate-income neighborhoods	• Controls discharges to the Tijuana River Estuary	• Limited disruption due to noise, aesthetics, or recreational uses • Minimum disruption resulting from air quality and traffic	• Low overall impact on public • General community support

EVALUATION MATRIX KEY: ● Positive Impact ● Moderate Impact ● Negative Impact

Alternative D

Projects 3c & 4d: NEW LIFT STATION TO DIVERT TIJUANA RIVER FLOWS TO SOUTH BAY INTERNATIONAL WASTEWATER TREATMENT PLANT (SBIWTP) AND NEW STORMWATER TREATMENT FACILITY AT SBIWTP

DESCRIPTION


Project 3


Project 4

Diversion of up to 163 mgd wet weather flows from the Tijuana River mainstem to a new Stormwater Treatment Facility at SBIWTP for Advanced Primary Treatment and discharge deep into the ocean through the South Bay Ocean Outfall (SBOO), plus additional storage at a new San Ysidro basin north of the river, east of Dairy Mart Road. Wet weather flows would go to the new treatment plant while the dry weather flows would continue to be routed to the existing treatment plant.

POTENTIAL BENEFITS

Reduces the number of unaddressed average annual transboundary flow days from 138 to 12 (91% reduction)

EST. ONE-TIME COST

Construction	Design
$361M	$43M

Env./Permitting: $4M

EST. ONGOING COST

Annual O&M Per Year: $4.8M

Annual Environmental Monitoring for 10 Years: $10M

PROS (+)

- Captures dry-weather flows and spills not captured upstream in Mexico
- Reduces impacts to downstream river, estuary, and beaches
- Provides new treatment facility for additional captured storm flows
- Provides advanced primary treatment of flows from small wet weather events (up to 163 MGD)
- Utilizes existing available space at IBWC SBIWTP
- Minimizes environmental impacts as the site is located within the current treatment facility boundary and utilizes the existing SBOO
- Additional storage at storage basin north of the river would increase stormwater capture and allow more efficient treatment of variable storm flows

CONS (-)

- Provides limited capacity to divert flows during rainy season (less than 1-year rain event)
- Requires ongoing maintenance to be effective
- Ponding water within storage basin could impact USCBP security activities during and immediately following significant storm events
- Requires significant environmental analysis and permitting
- Storage facility north of river, upstream of Dairy Mart Road would require significant maintenance to avoid vector and other impacts to adjacent neighborhoods.
- Requires construction of new primary treatment plant
- Requires significant annual maintenance
- Complex operation would require additional staff at SBIWTP to operate facility

ADDITIONAL INFORMATION

- NADB Diversion Study has evaluated the construction of a new diversion facility to primarily address flows that occur during dry weather (maximum diversion of 35 MGD)
- NADB Diversion Study proposes expanding the existing SBIWTP capacity to 35 MGD for additional dry and/or wet treatment capacity (primary treatment only)
- Max additional treatment is driven by the available peak capacity in the South Bay Ocean Outfall of 233 mgd and the permitted discharge of 40 mgd granted to SBWRP (233-40 = 193 mgd)
- Max treatment is further reduced by 30 mgd (163 mgd max) to allow for existing SBIWTP capacity
- Building a new treatment facility can be accommodated on federally owned land adjacent to the existing SBIWTP
- A separate treatment plant is preferred that does not combine stormwater flows with influent to the existing treatment plant to maintain integrity of the existing treatment process
- Storage pond would be designed to drain within 48-72 hours of a storm event
- Would require modification of the SBIWTP NPDES Discharge Permit

EVALUATION MATRIX

IMPLEMENTATION AND O&M			ENVIRONMENTAL		COMMUNITY / SOCIETAL			
Technical Feasibility	Operating Complexity	Sustainability (i.e., energy usage)	Impact to Habitat (River Valley)	Impact to Habitat (Ocean)	Environmental Justice	Ancillary Community Benefits	Limited Community Disruption	Public Support
🟢	🟡	🔴	🟢	🟢	🟡	🟢	🟡	🟡
• May have some environmental permitting challenges • All construction for the additional treatment to occur within existing treatment facility boundary • Construction is simplified with new treatment facility not connected to the existing treatment facility • Fewer unknowns as related to the treatment site as sub-surface and geotechnical info should be readily available • Requires reclaiming the use of the land from current lease holder for the storage basin • Subsurface and geotech information at the storage basin site is unknown	• Remote operation is easy • Not dependent on upstream or downstream processes • Complex operations and high level of annual maintenance required • Quality of effluent depends on process efficiency • Allows operational flexibility with a new treatment facility separate from the existing plant • No issues accessing treatment facilities during storms or inclement weather • Storage basin proposes a potential security issue for US CBP • Ongoing maintenance (e.g. sediment removal) required at the storage basin	• Can implement sustainable construction of treatment facility with moderate level of success • Requires high power consumption but can be offset using alternative power source • Requires high chemical usage • Requires high manpower for O&M • The construction of the storage basin will require large scale earthwork and disposal of fill	• Construction within existing treatment facility results in minimal impacts to sensitive habitats • Storage basin will impact current agricultural use but will result in minimal impacts to sensitive habitat	• Provides treatment and discharge through the SBOO which minimizes impacts to the coastal and estuarine habitats	• Potential for odor impacts from the storage basin to affect low- to moderate-income neighborhoods, but unclear if odors from a managed basin would be worse than existing conditions	• Controls discharges to the Tijuana River Estuary	• Potential disruption of air and noise quality due to maintenance and operation of storage basin • Potential disruption of traffic due to maintenance and operation of storage basin • Potential impact to aesthetics due to storage basin	• Concerns over potential odor and vector issues • Support for maximizing opportunities to capture and treat transboundary flows

EVALUATION MATRIX KEY: 🟢 Positive Impact 🟡 Moderate Impact 🔴 Negative Impact

Alternative K

PROJECTS 1 & 2: TIJUANA RIVER TRASH BOOMS AND SEDIMENTATION BASIN

DESCRIPTION


Project 1


Project 2

Install trash capture devices (booms) across the span of the Tijuana River just upstream of the transition from a concrete to earthen channel (within IBWC's flood control channel). The booms would catch trash as it enters the United States side of the Tijuana River, and would require frequent maintenance. Construct sedimentation basins either within or adjacent to the Tijuana River, upstream of Dairy Mart Rd. The basins would capture flows and allow sediment to settle into the basins to reduce sewage and sediment inflow into the downstream portions of the Tijuana River. This project would result in the retention of polluted runoff for a period of time. The basins could also incorporate green technology to remove contaminants from the water. These facilities would require frequent maintenance. This project is currently being analyzed by IBWC through a feasibility study (60% Feasibility Report, Stantec, June 18, 2019).

POTENTIAL BENEFITS

Removal of 20,500 tons of trash and sediment (5-year storm event per 60% Feasibility Report).

EST. ONE-TIME COST

Construction	Design
$12M*	TBD

Env./Permitting: $4M

EST. ONGOING COST

Annual O&M Per Year: TBD

Annual Environmental Monitoring for 10 Years: $10M

*Earthwork costs only per 60% Feasibility Report

PROS (+)

- Provides similar benefits as existing Goat Canyon trash boom and sediment basins, which have demonstrated success
- Can be incorporated into other projects
- Reduces impacts to natural areas downstream of Monument Road
- Reduces excess sediment reaching the Tijuana River Valley
- Provides benefits to natural hydrology
- Reduces the need for dredging downstream of Monument Road
- Reduces flooding at Monument Road

CONS (-)

- Challenging to size infrastructure due to the unpredictability in type and volume of trash
- Too much flow can wash out the trash capture infrastructure
- Requires active maintenance to maximize trash and sediment capture
- Potential to become a vector or odor nuisance if not properly maintained
- Maintenance access can be complicated during rainy season
- Requires significant environmental analysis and permitting

ADDITIONAL INFORMATION

- Amount of trash captured would depend on the peak, velocity, and duration of storm flows
- Existing river channel upstream of Dairy Mart Road currently acts as a type of natural basin trapping sediment from moving downstream

EVALUATION MATRIX

IMPLEMENTATION AND O&M			ENVIRONMENTAL		COMMUNITY / SOCIETAL			
Technical Feasibility	Operating Complexity	Sustainability (i.e., energy usage)	Impact to Habitat (River Valley)	Impact to Habitat (Ocean)	Environmental Justice	Ancillary Community Benefits	Limited Community Disruption	Public Support
●	●	●	●	●	●	●	●	●
• Trash booms and sediment basins are simple to install and operate • Would act very similar to Goat Canyon which has proven feasibility	• Basin would have to be cleaned out on a regular basis, but operation is not complex • Trash booms and sediment basins are easy to install and operate but do require regular collection of trash	• Energy consumption may be signficant for removal of trash and sediment • No chemical requirements • Results in low-to-moderate construction requirements • Requires fuel for collection & transportation of disposable, recycable solids, and sediment • Minimal to no additional materials needed • Requires significant manpower for project as trash and sediment needs to be collected/removed from the booms and basins	• Trash capture not effective during high-flow events • Trash boom placement across channel limits impacts to valley habitat • Sediment basins have limited effectiveness on suspended (fine) sediment and during high-flow events • Sediment basin placement would have a local impact to valley habitat (i.e. basin site)	• Trash capture not effective during high-flow events • Trash boom placement across channel has no negative impacts to ocean habitat • Sediment basins have limited effectiveness on suspended (fine) sediment and during high-flow events • Sediment basin placement would have no negative impacts to ocean habitat	• No new impacts created that may affect low- to moderate-income neighborhoods	• Most visible trash would be in one location instead of scattered throughout Tijuana River Valley • Collection and removal of sediment would likely reduce flooding, as well as improve water quality	• Trash would need to be routinely collected with machinery and trucks and hauled away • Sediment would need to be routinely collected with machinery and trucks and hauled away	• Low overall impact on public • General community support

EVALUATION MATRIX KEY: ● Positive Impact ● Moderate Impact ● Negative Impact

Alternative L and M

PROJECTS 10 & 11 (Options a and b): SMUGGLER'S GULCH TRASH BOOM AND SEDIMENTATION BASIN

DESCRIPTION

Project 10

Project 11

Installation and management of trash devices (booms) and sediment basin(s) within Smuggler's Gulch, downstream of existing collector structure. Alter Terra has funding for a pilot project to install a trash boom in coordination with the County. Options for in-line and off-line sediment basin(s) are considered. The basin(s) would capture flows and allow sediment to settle into the basin(s) to reduce sediment inflow into Smuggler's Gulch. Project also includes replacement of existing culvert under Monument Road. This project would reduce flooding and the need for ongoing dredging of the channel downstream of Monument Road.

POTENTIAL BENEFITS

Removal of trash and sediment, reduced dredging upstream and downstream of Monument Road and reduced flooding at Monument Road.

EST. ONE-TIME COST

Construction	Design
$2M - $5M	$0.2M

Env./Permitting: $4M

EST. ONGOING COST

Annual O&M Per Year: $1.1M

Annual Environmental Monitoring for 10 Years: $10M

PROS (+)

- Provides similar benefits as existing Goat Canyon trash boom and sediment basins, which have demonstrated success
- Can be incorporated into other projects
- Reduces impacts to natural areas downstream of Monument Road
- Reduces excess sediment reaching the Tijuana River Valley
- Provides benefits to natural hydrology
- Reduces the need for dredging downstream of Monument Road
- Reduces flooding at Monument Road

CONS (-)

- Challenging to size infrastructure due to the unpredictability in type and volume of trash
- Too much flow can wash out the trash capture infrastructure
- Requires active maintenance to maximize trash and sediment capture
- Potential to become a vector or odor nuisance if not properly maintained
- Maintenance access can be complicated during rainy season
- Requires significant environmental analysis and permitting

ADDITIONAL INFORMATION

- Pilot project in progress for trash boom (Alter Terra)
- Currently the City of San Diego and County of San Diego have ongoing sediment removal programs to reduce flooding
- Current programs have limitations due to resources, permitting, and weather conditions

EVALUATION MATRIX

IMPLEMENTATION AND O&M			ENVIRONMENTAL		COMMUNITY / SOCIETAL			
Technical Feasibility	Operating Complexity	Sustainability (i.e., energy usage)	Impact to Habitat (River Valley)	Impact to Habitat (Ocean)	Environmental Justice	Ancillary Community Benefits	Limited Community Disruption	Public Support
●	●	●	●	●	●	●	●	●
• Trash booms and sediment basins are simple to install and operate • Would act very similar to Goat Canyon which has proven feasibility	• Basin would have to be cleaned out on a regular basis, but operation is not complex • Trash booms and sediment basins are easy to install and operate but do require regular collection of trash	• Energy consumption may be signficant for removal of trash and sediment • No chemical requirements • Results in low-to-moderate construction requirements • Requires fuel for collection & transportation of disposable, recycable solids, and sediment • Minimal to no additional materials needed • Requires significant manpower for project as trash and sediments needs to be collected/removed from the booms and basins	• Trash capture not effective during high-flow events • Trash boom placement across channel limits impacts to valley habitat • Sediment basins have limited effectiveness on suspended (fine) sediment and during high-flow events • Sediment basin placement would have a local impact to valley habitat (i.e. basin site)	• Trash capture not effective during high-flow events • Trash boom placement across channel has no negative impacts to ocean habitat • Sediment basins have limited effectiveness on suspended (fine) sediment and during high-flow events • Sediment basin placement would have no negative impacts to ocean habitat	• No new impacts created that may affect low- to moderate-income neighborhoods	• Most visible trash would be in one location instead of scattered throughout • Collection and removal of sediment would likely reduce flooding, as well as improve water quality	• Trash would need to be routinely collected with machinery and trucks and hauled away • Sediment would need to be routinely collected with machinery and trucks and hauled away	• Low overall impact on public • General community support

EVALUATION MATRIX KEY: ● Positive Impact ● Moderate Impact ● Negative Impact