Southeast Arizona Citizens Forum
Transboundary Flow Mitigation
Naco, Sonora

Sierra Vista, Arizona, March 21, 2019
The Problem: TB Flows

WEST:
TB Flows
5-10 l/s

EAST:
TB Flows
5-10 l/s

Issues

Technical
Undetermined Causes
No WWCDrawings
Video Imp necessary
High per capita W
Need metering
Likely High W loss
Discharge – Ag user

O&M
Lack of equipment and personnel for O&M
Old Infrastructure
Needs Rehab
Needs Cleaning Progr

Budgetary
Utility – rate & collections issues conditions
$5 Electric Bills/Solar
Admin issues (CONAMA)
Federal limitations
State limitations

Jurisdiction
Utility – Municipality Border – CILA/IBWC
Water Authority – CONAGUA/Projects
State-CEA/Projects
NADB Financing

Political
New city government
Federal Elections
Comm CONAGUA-US
New President 12/1
Naco-State of Sonora

Background

<table>
<thead>
<tr>
<th></th>
<th>1996</th>
<th>2018</th>
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<tbody>
<tr>
<td>Population</td>
<td>5,733</td>
<td>6,401</td>
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<tr>
<td>Water consumption per capita per day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liters</td>
<td>250</td>
<td>675</td>
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<tr>
<td>Gallons</td>
<td>66</td>
<td></td>
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<tr>
<td>Average Potable Water Flowrate</td>
<td></td>
<td></td>
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<tr>
<td>Liters per second</td>
<td>21</td>
<td>50</td>
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<tr>
<td>Gallons per minute</td>
<td>333</td>
<td></td>
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<tr>
<td>Average Waste Water Flowrate</td>
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<td></td>
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<tr>
<td>Liters per second</td>
<td>17</td>
<td>40</td>
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<tr>
<td>Gallons per minute</td>
<td>266</td>
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</table>

Source: AYMA Study

Naco, Sonora Hourly WW Flow (l/s)

Max 42.5 MGD
Avg 0.8 MGD
Min 0.5 MGD

North American Development Bank
The City of Naco applied for EPA funding, and the Project ranked high in the 2018 prioritization process, however, a diagnostic study is required to pinpoint the main issues and scope the infrastructure project appropriately; thus, EPA approved technical assistance for this study in November 2018.

### NADB/EPA Project Prioritization and Selection Process

<table>
<thead>
<tr>
<th>Rank</th>
<th>ID No.</th>
<th>Project Name</th>
<th>Location</th>
<th>Project Components</th>
<th>Connections (New or Improved)</th>
<th>Estimated Cost US$</th>
<th>Pending Project Development Activities</th>
<th>Project Readiness (est. # months to certification)</th>
<th>Estimated PDAP</th>
<th>Total Points</th>
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<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>Rehabilitation of Wastewater Collection Main Lines Poniente 1A Collector</td>
<td>Tijuana, B.C.</td>
<td>1,860 m 42-inch diameter</td>
<td>23,506</td>
<td>$5,500,000</td>
<td>Geotechnical</td>
<td>9</td>
<td>$20,000</td>
<td>85</td>
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<td>2</td>
<td>6A</td>
<td>Rehabilitation of WWC of Infonavit Cucapah, Irrigación and San Marcos Areas</td>
<td>Mexicali, B.C.</td>
<td>3,005 m 8, 15 &amp; 18-inch diameter</td>
<td>170,000</td>
<td>$4,860,000</td>
<td>Environmental, FD by Sponsor</td>
<td>15</td>
<td>$80,000</td>
<td>85</td>
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<td>3</td>
<td>16</td>
<td>Rehabilitation of Wastewater Small Lift Stations</td>
<td>Mexicali, B.C.</td>
<td>13 Small Lift Stations</td>
<td>184,656</td>
<td>$1,581,085</td>
<td>Environmental, FD by Sponsor</td>
<td>18</td>
<td>$60,000</td>
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<td>4</td>
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<td>Rehabilitation of Wastewater Collection Main Lines Oriente Collector</td>
<td>Tijuana, B.C.</td>
<td>1,100 m 42-inch diameter</td>
<td>51,364</td>
<td>$1,388,888</td>
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<tr>
<td>5</td>
<td>21</td>
<td>Wastewater Treatment Rehabilitation in Naco</td>
<td>Naco, Sonora</td>
<td>2.5 mgd WWT Rehabilitation</td>
<td>1,863</td>
<td>$1,000,000</td>
<td>Planning, Environmental, FD</td>
<td>15</td>
<td>$230,000</td>
<td>81</td>
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<td>6</td>
<td>12</td>
<td>Rehabilitation of Wastewater Collection Main Lines Mexicali I Phase II System</td>
<td>Mexicali, B.C.</td>
<td>17,002 m 8 to 24-inch diameter</td>
<td>26,083</td>
<td>$3,860,394</td>
<td>Environmental, FD by Sponsor</td>
<td>15</td>
<td>$60,000</td>
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<td>7</td>
<td>7</td>
<td>Rehabilitation of Wastewater Collection Main Lines International Collector</td>
<td>Tijuana, B.C.</td>
<td>2,747 m 72-inch diameter</td>
<td>244,944</td>
<td>$16,250,000</td>
<td>Diagnostic, Planning, Environmental, FD by sponsor</td>
<td>18</td>
<td>$80,000</td>
<td>80</td>
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<td>8</td>
<td>15</td>
<td>Rehabilitation of Wastewater Lift Stations Force Mains</td>
<td>Mexicali, B.C.</td>
<td>Pipelines 20 to 48-inch diameter in 5 Lift Stations</td>
<td>172,723</td>
<td>$3,977,172</td>
<td>Environmental FD by Sponsor</td>
<td>15</td>
<td>$60,000</td>
<td>75</td>
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<td>9</td>
<td>8</td>
<td>Palo Verde Wastewater Collection and Treatment System</td>
<td>Palo Verde, California</td>
<td>WWAC &amp; WWTP 164 Connections</td>
<td>164</td>
<td>$4,500,000</td>
<td>Final Design</td>
<td>15</td>
<td>$225,000</td>
<td>74</td>
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<tr>
<td>10</td>
<td>6</td>
<td>Pena Blanca Force Main Modification</td>
<td>Nogales Arizona</td>
<td>1000 feet of FM</td>
<td>4,726</td>
<td>$650,000</td>
<td>Geotechnical</td>
<td>6</td>
<td>$20,000</td>
<td>72</td>
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</tbody>
</table>
Recent Milestones

MAR 28, 2018 – EPA prioritization/funding letter to CONAGUA

(1) fully eliminated the current intermittent transboundary sewage flows;
(2) arranged for sustainable utility management to prevent future emergencies; and
(3) instituted systems to promptly address future emergencies, if they occur.

APR 15, 2018 - NADB and CILA start coordinating actions in preparation of MONSOON season (Min 273)

JUN 11, 2018 – CONAGUA’s letter B00.7.04.-115 to answer EPA’s Naco Project Conditions

AUG 27, 2018 – ADEQ-NADB agreement

OCT 04, 2018 – OOMAPAS NACO- NADB Agreement
Recent Milestones

**NOV 21, 2018** – EPA instructs NADB to initiate the Naco infrastructure diagnostic and preliminary engineering and organizational structure analysis.

**DEC 03, 2018** – Meeting with ADEQ’s Director

**DEC 11, 2018** – Meeting with CEA and ADEQ at Nogales, BTC

**DEC 18, 19 and 25, 2018** – NADB – Engineering & Construction Contractor (ECC) Meetings

**DEC 28, 2018** – ECC Engineer hired

**JAN 13, 2019** – Libertad Bypass completed

**FEB 12, 2019** – Meeting Cochise County Board

**FEB 20, 2019** – Meeting EPA Headquarters
No TB WW flows from Naco, SON (east or west) since November 21, 2018

**Actions**

- Focused cleaning actions to **north west** area of WWC system (Nov 26, 2018)
- Installed **metering** rod and established **monitoring** MH#01 Bad Muro (Dec 6, 2018)
- Meeting with CEA to discuss possible procurement for construction (Dec 5 & 25, 2019)
- NADB proposed hiring **Engineering & Construction Contractor (ECC)** in Dec. 2018
- Technical Review with ECC/Supervisor (Dec 18, 19 and 25, 2018)
- Contracted ECC on December 28, 2019 to:
  - Provide **faster response/monitoring** and **lead cleaning/dredging actions**
  - Provide **technical support/engineering/repairs** as necessary
  - Verify grade and flow directions in the northwest area of Naco (Bad Muro)
Actions

- At the Mayors’ request, contacted SOLAR contractor (SOLAREX) and estimated amount to complete the solar field approx. **US $150,000** (construction $50K, transformers and CFE connection $100K)
- Installed metering rod and established East Lagoon monitoring (Jan 9, 2018)
- Identified location to divert flows from west to east to relieve West MH#01 Bad Muro
- Built Libertad Bypass to redirect flows (Jan 11, 2019)
- Obtained support from Nogales, AZ to inspect potential DW leak area
- Continued flow analysis and cleaning (DW Leak Area, MH#01 and MH#9)
- Started Lagoon Analysis coordination with CONAGUA
Proposed West Interceptor Replacement (mh#1 to mh#9)
WW Collection, Naco, Sonora

- MH#1 Bad Muro
- MH#9
- 18" PVC

Divert ~50% Flows

1. 0.5 MGD
   - 22 LPS
   - 56%

2. 0.16 MGD
   - 7 LPS
   - 17%

3. 0.24 MGD
   - 11 LPS
   - 27%

East Manhole

MH#1 Bad Muro

West Interceptor

WW Collection, Naco, Sonora
North West Area WW Flow Diversion

Original Flow Diversion Idea

Possible DW Infiltration

MH #01 Bad Muro

USA

ADUANA

MH #08

Pump Station

MH #23

MH #24

MH #33

MH #26

City Hall

Bypass Data
PVC Clase 20
10-inch
128 lps capacity
Manhole #9

Bypass 43 meters
PVC Clase 20
10-inch
128 lps capacity

North View
Proposed Actions

- Continue monitoring Manhole #1, East Lagoon and Manhole #9

- Replace **West Interceptor** (Manhole #1 to #9)
  - Open trench construction

- Identify mid-term solution
  - Implement redundancy system using **by-passes** or pumping
  - Improve **East Lagoon** Operation and Discharge

- Start EPA **Diagnostic Study** to find **Long Term Solution** (May 2019)
North American Development Bank

West Interceptor Replacement 493 meters PVC Clase 20 12-inch

Manhole #1

Manhole #9

East View
West Interceptor Replacement

Piping
PVC Clase 20
12-inch
West Interceptor Replacement
ESTIMATED COST

WEST INTERCEPTOR (12-inch Diameter)
Crossing Mexican Aduana using Open Trench Construction

NACO, SONORA

<table>
<thead>
<tr>
<th></th>
<th>LABOR</th>
<th>MATERIALS</th>
<th>TOTAL (US)</th>
</tr>
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<tbody>
<tr>
<td>WEST INTERCEPTOR mh #1-#9 (490 meters, 12-inch dia PVC)</td>
<td>$28,408.91</td>
<td>$15,220.44</td>
<td>$43,629.35</td>
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<td></td>
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<tr>
<td>IMPORTE</td>
<td></td>
<td></td>
<td>$43,629.35</td>
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<tr>
<td>Value Added Tax</td>
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<td>$6,980.70</td>
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<tr>
<td>TOTAL</td>
<td></td>
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<td>$50,610.05</td>
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Mar-2019
## West Interceptor Replacement

### CONSTRUCTION SCHEDULE

<table>
<thead>
<tr>
<th>WEST INTERCEPTOR (12-inch Diameter)</th>
<th>Construction Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>NACO, SONORA</td>
<td>MESES</td>
</tr>
<tr>
<td></td>
<td>MARCH</td>
</tr>
<tr>
<td></td>
<td>WEEKS</td>
</tr>
<tr>
<td><strong>CONCEPT</strong></td>
<td>1</td>
</tr>
<tr>
<td>WEST INTERCEPTOR (From manhole #1 to #9)</td>
<td>5</td>
</tr>
<tr>
<td><strong>ADUANA CROSSING</strong></td>
<td>9</td>
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</table>

North American Development Bank
Naco Transboundary Flow Monitoring Report
Prepared by North American Development Bank
18-Mar-19

Weather
89 days to monsoon season
13 weeks

WW System Key Point Level Measurements -- TODAY

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Measurement</th>
<th>Target</th>
<th>Comments</th>
<th>Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Man hole #01 &quot;Bad Muro&quot;</td>
<td>16-inches (0.4 meters)</td>
<td>12-inches (0.3 meters)</td>
<td>Stable since 1/11</td>
<td></td>
</tr>
<tr>
<td>East Lagoon</td>
<td>24-inches</td>
<td>Level Zero (1,414 m SL)</td>
<td>Stable</td>
<td></td>
</tr>
</tbody>
</table>
Status March 18, 2019

East Lagoon Discharge Vault - Naco
Afternoon - WW Levels (Inches)

Inches over target

TARGET Zero (Elev. 1,404 meters over SL)

BYPASS
North American Development Bank

Interceptor

Anaerobic Section

Facultative Section

Inter-lagoon PS

Effluent PS

South View

East Lagoon System

Area 9 acres

Interceptor

NADB NACO 1

North American Development Bank
East Lagoon System – BATHYMETRY Study
Issues and Risks

1. Collapse of obsolete segment (MH#1 to MH#9) of West Interceptor.
2. Discharge caused by High water Levels of Facultative Lagoons and/or Insufficient inter-lagoon and effluent pumping.
Potential Areas For Reuse

New Lagoons and/or Wetlands

Effluent PS

Facultative Section

EAST LAGOON SYSTEM

South View
Thank you.

Roberto Molina, MS, PMP
Program Manager West Region
Grants Projects Development and Implementation
North American Development Bank
rmolina@nadb.org