

# International Boundary and Water Commission

## United States and Mexico

### United States Section

4191 N. Mesa, El Paso, TX 79902



## International Trunkline/International Outfall Interceptor

The International Trunkline and International Outfall Interceptor (IOI) is a 9 mile long pipeline carrying transboundary wastewater flows from Nogales, Sonora, Mexico as well as Nogales and Rio Rico, Arizona to the Nogales International Wastewater Treatment Plant (NIWTP). The Trunkline/IOI was originally built in 1971. Since then, the pipeline has deteriorated significantly due to excessive combined sewage and stormwater flows from Mexico requiring rehabilitation for continued serviceability.

### BACKGROUND

The International Trunkline and IOI is critical to solving border sanitation problems and supports USIBWC's mission for wastewater treatment. Under the United States' Treaty of 1944 with Mexico (*Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande*), USIBWC was directed to give preferential attention to the solution of all border sanitation problems concerning boundary and transboundary waters and granted authority to provide any necessary sanitary measures or works to satisfy that requirement. In addressing border sanitation in the Nogales, Arizona – Nogales, Sonora area the following are applicable to this project:

- Minutes No. 206, "*Joint Operation and Maintenance of the Nogales International Sanitation Project*," dated January 13, 1958.
- Minutes No. 227, "*Enlargement of the International Facilities for the Treatment of Nogales, Arizona and Nogales, Sonora Sewage*," dated September 5, 1967.
- Minutes No. 276, "*Conveyance, Treatment and Disposal of Sewage from Nogales, Arizona and Nogales, Sonora Exceeding the Capacities Allotted to the United States and Mexico at the Nogales International Sewage Treatment Plant Under Minute No. 227*," dated on July 26, 1988.
- Minutes No. 326, "*Rehabilitation of the International Trunkline and International Outfall Interceptor (IOI) in Nogales, Arizona*," dated April 20, 2021.

To provide for the needs of 20,000 people within Nogales, Arizona and Nogales, Sonora (Ambos Nogales) and the surrounding Santa Cruz County, the original pipeline consisted of a 1.5 mile main collector line built in 1951 as part of the Nogales International Sanitation Project and conveyed sewage to the original NIWTP located in downtown Nogales, Arizona. With the population increasing over the years, the contributions of wastewater exceeded the capacity of the original NIWTP. As a result, the governments of the United States and Mexico in 1967 (built in 1971) approved the expansion and relocation of the NIWTP to Rio Rico, Arizona under Minute 227 along with expansion and extension of the pipeline. However, it was agreed that Mexico would not contribute toward the relocation of the plant but would cost-share based on what it would have cost to expand the original plant at the original site and to replace and enlarge the 1.5 miles of original pipeline. Additionally, it was agreed that Mexico would not be responsible to cost-participate in the operation and maintenance of the section of the pipeline from the site of the original plant to the new plant since relocation was required for domestic reasons. This new extended 7.3 mile section of sewer line became known as the International Outfall Interceptor and the original 1.5 mile section is known as the International Trunkline.

Failure to maintain the operation of this pipeline would result in the loss of critical infrastructure and could result in a sewage leakage or spill causing significant health and safety hazards for the communities of Ambos Nogales. Additionally, roughly 12 millions gallons per day of treated water from the NIWTP is an important contribution to the Santa Cruz River basin which supplies water for drinking, ranching, farming and other activities critical to the Arizona economy. The river also sustains habitat critical to migratory species.

## STRUCTURE

The pipeline is divided into 2 segments based on the sections between the border, the original NIWTP, and the relocated NIWTP. Mexico cost-shares operation and maintenance of only the Trunkline.

International Trunkline	from US-Mexico International Border to Manhole 27	8,146 ft
IOI	from Manhole 27 to NIWTP	38,529 ft

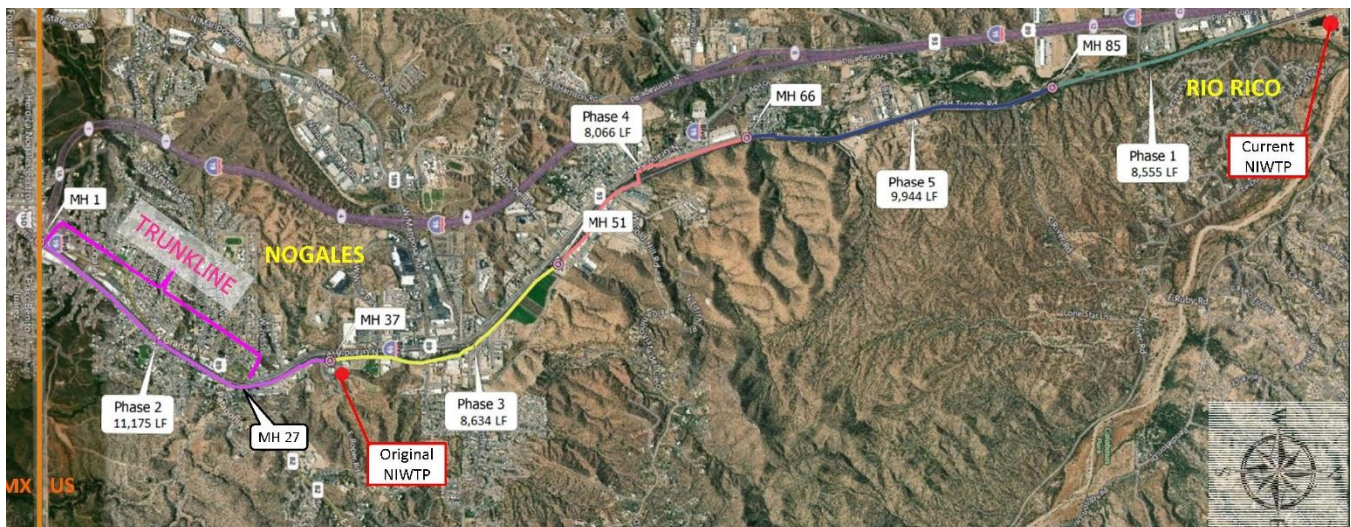
The pipeline has over 100 manholes within its alignment. The pipeline ranges in size between 24 inches and 42 inches in diameter and is comprised of reinforced and unreinforced concrete sections. The City of Nogales conducted a comprehensive evaluation of the pipeline to assess its condition in 2005 and identified significant pipeline issues along with deterioration of the pipes.

Over the decades, the pipeline has had a lack of an adequate maintenance system and increased wastewater flow inputs from Nogales, Arizona and Nogales, Sonora that further decreased the remaining service life of the pipeline. The Trunkline and IOI require deteriorating portions of its infrastructure to be rehabilitated and/or possibly replaced. The operational defects included the accumulation of debris, groundwater inflow and infiltration, and root intrusion in manholes and the pipeline throughout its length. The structural defects included corrosion, cracks, wall penetrations, and invert erosion.

Additionally, throughout its alignment the pipeline traverses underneath portions of an existing concrete lined and unlined Nogales Wash that further threatens the structural stability of the pipe. Due to the degraded condition of the Wash, the pipeline and manholes have been exposed in the past during heavy monsoon seasons. Localized repairs were made, including improvements for the protection of the pipe.

A project for rehabilitation of the pipe and manholes was prepared. Due to the estimated cost of the project, funding was expected to be obtained incrementally and thus the project was broken into 5 phases and prioritized based on the pipeline condition.

Phase 1	from Manhole 85 to Manhole 99 (NIWTP)	8,555 ft
Phase 2	from US-Mexico International Border to Manhole 37	11,175 ft
Phase 3	from Manhole 37 to Manhole 51	8,634 ft
Phase 4	from Manhole 51 to Manhole 66	8,066 ft
Phase 5	from Manhole 66 to Manhole 85	9,944 ft



## REHABILITATION

Implementing this rehabilitation project will extend the service life of the pipeline by rehabilitating the manholes and the pipeline itself. The manhole rehabilitation will repair any structural damage, eliminate inflow and infiltration, and establish pipeline access. This rehabilitation includes grout repair at the manholes, application of a coating system used specifically for the lining of manholes, and debris removal



within the manholes.

The pipeline rehabilitation will repair structural damage and eliminate inflows into the pipeline. This rehabilitation includes utilizing the Cured-in-Place Pipe (CIPP) process which consists of a resin-filled polyester felt tube, or liner, that is inserted or inverted into an existing pipe, inflated with water or steam and cured in place. The resulting pipe inside of a pipe is a structural replacement of the host pipe. CIPP generally is a trenchless technology with little or no disruption to the existing ground.

The City of Nogales also worked with NAD Bank to address various direct lateral connections to the Trunkline/IOI that existed by either relocating the connection of the lateral to an existing manhole or installing a new manhole at the existing lateral connection. This work was completed prior to the rehabilitation to avoid construction schedule impacts.



**PIPE DETERIORATION**



**CRACKS**



**HOLES**



**ROOT INTRUSION**



**INFLOW & INFILTRATION**

#### Existing Pipeline Condition

### SETTLEMENT AGREEMENT WITH ADEQ

In 2012, the Arizona Department of Environmental Quality (ADEQ) filed suit against USIBWC for alleged Clean Water Act violations. ADEQ and USIBWC entered into settlement discussions in 2018 and finalized a Memorandum of Agreement (MOA) on June 23, 2020. The scope of settlement included:

- Upgrade the aged wastewater conveyance pipeline
- USIBWC to oversee the rehabilitation of the IOI pursuant to terms
- Provide additional protection of IOI in Nogales Wash locations most vulnerable to damage from stormwater and debris
- Dismiss legal action

Funding support was also obtained from the State of Arizona for \$2.59 Million and Freeport McMoran Foundation for \$1 Million for the project as a result of this settlement. This partnership with ADEQ was a critical step in moving forward with the project.

### COST SHARE WITH MEXICO

A cost share was required for rehab of the 8,146 ft of the Trunkline (Phase 2). Final agreement of Mexico's share was \$1.361 Million under the Joint Report signed December 19, 2019 and Minute No. 326 signed April 20, 2021. Mexico funded their share of the work before construction started.

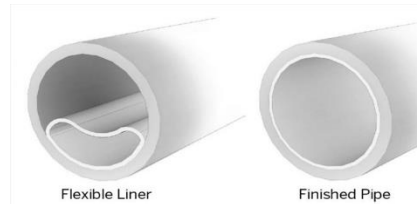
**CONSTRAINTS**

Work is located adjacent to the existing Union Pacific Railroad (UPRR) within their Right-of-Way (ROW) which requires a maintenance agreement with UPRR and Contractor Rights of Entry.

Access to the existing City of Nogales Trunkline/IOI pipeline easement is limited and requires Contractor coordination and agreements to enter through City of Nogales, Santa Cruz County, and private properties. The construction drawings proposed various temporary construction easements for access to the existing pipeline easement which have been obtained by USIBWC with the assistance of Arizona Department of Environmental Quality (ADEQ).

**CAST-IN-PLACE PIPING (CIPP)**

- Trenchless technology with little or no disruption to the existing ground conditions
- A resin filled polyester felt tube, or liner, is inserted and inverted into an existing pipe
- The liner is inflated and thermally cured-in-place using either hot water, steam, or UV



**CIPP Process**

- 1 A sewer camera reveals a blocked, breached and/or root intruded pipe.
- 2 The pipe is cleaned with a scorpion cutting tool.
- 3 A CIPP Liner is pulled into place and the bladder inflated.
- 4 After curing the bladder is removed leaving behind a structural "pipe within a pipe".

**BEFORE**

**AFTER**



**Phases 1-3**

Rehabilitated in 2023 for \$15,079,300.10 and included:

- 28,364 LF (5.3 Miles) of piping
- 56 manholes

The following was added for protection of the IOI:

- Slope repairs and erosion protection at Manhole (MH) 93
- Slope repairs and erosion protection at MH 86
- Concrete encasement of pipeline crossing Nogales Wash between MH 86 to 87

**Phase 4 & 5**

Contract awarded in 2022 for \$15,305,075.00. These phases are under construction and estimated to be completed in summer 2024.

- Rehab of 18,010 LF (3.4 Miles) of piping
- Rehab of 38 manholes

