Cochise County Board Meeting

Naco Transboundary Flows

Catalyzing a project to assist Naco, Sonora to mitigate transboundary flows to Arizona

North American Development Bank

Bisbee, Arizona

February 6, 2019

Introduction

The U.S. Government and the Government of Mexico convinced of the importance of the conservation, protection and enhancement of their environments and recognizing the essential role of cooperation and the bilateral nature of many transboundary environmental issues; and that such issues can be most effectively addressed jointly; signed an agreement to form the NADB and the Border Environment Cooperation Commission (BECC) in January 1994. The operations of BECC were integrated into the NADB in November 2018.

NADB works to strengthen cooperation among interested parties and to facilitate the financing, construction, operation and maintenance of environmental infrastructure projects in the border region and assist community adjustment and investment.

This presentation will focus in the joint efforts to help mitigate TB flows in Naco, Sonora and to provide a better understanding of the nature of the issues and the needs of these border communities.

Introduction

CHAPTER II • NORTH AMERICAN DEVELOPMENT BANK

Article I • Purposes and Functions

Section 1. Purposes

The purposes of the Bank shall be:

(a) to provide financing for projects certified by the Board of Directors in accordance with Articles I and II of Chapter III, and, as the Board of Directors deems appropriate, to otherwise assist the Commission in fulfilling its purposes and functions;

Introduction

Section 2. Functions

To implement its purposes, the Bank shall utilize its own capital resources, funds raised by it in financial markets, and other available resources and shall fulfill the following functions:

(a) to promote the investment of public and private capital contributing to its purposes;

(b) to encourage private investment in projects, enterprises, and activities contributing to its purposes, and to supplement private investment when private capital is not available on reasonable terms and conditions; and

(c) to provide, under the direction of the Board of Directors, technical and other assistance for the financing and the implementation of the plans and projects.

In carrying out its functions, the Bank shall cooperate as appropriate with national and international institutions and with private sources supplying investment capital.

The Problem: TB Flows

Issues

Technical

Undetermined Causes
No WWC drawings
Video Insp 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
$$ Electric Bills/Solar
Admin issues (Conagua)
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

Naco TB Flows

NADB/EPA Project Selection Process

NADB works with EPA in selecting Projects through PRIORITIZATION ranking process. NADB recommended the Naco Project as one of the candidates.

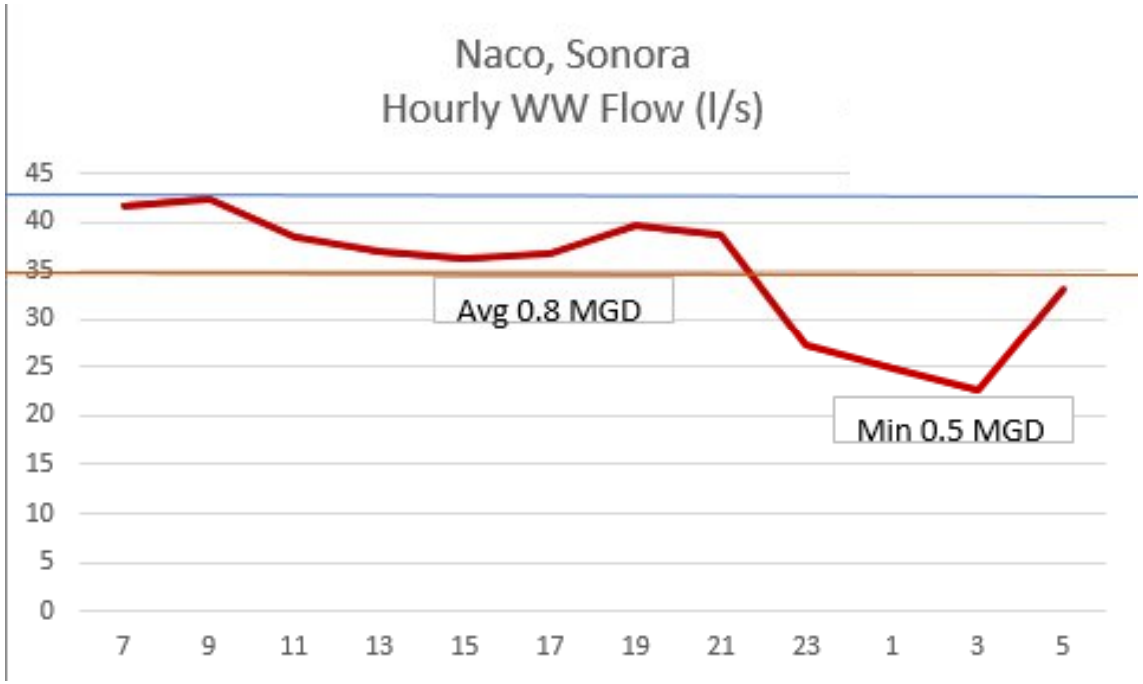
Rank	ID No.	Project Name	Location	Project Components	Connections (New or Improved)	Estimated Cost US$	Pending Project Development Activities	Project Readiness (est. # months to certification)	Estimated PDAP	Total Points
1	5	Rehabilitation of Wastewater Collection Main Lines Poniente 1A Collector	Tijuana, B.C.	1,860 m 42-inch diameter	23,506	$ 5,500,000	Geotechnical	9	$ 20,000	85
2	6A	Rehabilitation of WWC of Infonavit Cucapah, Irrigación and San Marcos Areas	Mexicali, B.C.	3,005 m 8, 15 & 18-inch diameter	170,000	$ 4,860,000	Environmental, FD by Sponsor	15	$ 80,000	85
3	16	Rehabilitation of Wastewater Small Lift Stations	Mexicali, B.C.	13 Small Lift Stations	184,656	$ 1,581,085	Environmental, FD by Sponsor	18	$ 60,000	85
4	9	Rehabilitation of Wastewater Collection Main Lines Oriente Collector	Tijuana, B.C.	1,100 m 42-inch diameter	51,364	$ 1,388,888	Environmental, FD by Sponsor	18	$ 80,000	85
5		Wastewater Treatment Rehabilitation in Naco	Naco, Sonora	2.5 mgd WWT Rehabilitation	1,863	$ 1,000,000	Plannning, Environmental, FD	15	$ 230,000	81
6	12	Rehabilitation of Wastewater Collection Main Lines Mexicali I Phase II System	Mexicali, B.C.	17,002 m 8 to 24-inch diameter	26,083	$ 3,860,394	Environmental, FD by Sponsor	15	$ 60,000	80
7	7	Rehabilitation of Wastewater Collection Main Lines International Collector	Tijuana, B.C.	2,747 m 72-inch diameter	244,944	$ 16,250,000	Diagnostic, Planning, Environmental, FD by sponsor	18	$ 80,000	80
8	15	Rehabilitation of Wastewater Lift Stations Force Mains	Mexicali, B.C.	Pipelines 20 t0 48-inch diameter in 5 Lift Stations	172,723	$ 3,977,172	Environmental FD by Sponsor	15	$ 60,000	75
9	8	Palo Verde Wastewater Collection and Treatment System	Palo Verde California	WWC & WWTP 164 Connections	164	$ 4,500,000	Final Design	15	$ 225,000	74
10	6	Pena Blanca Force Main Modification	Nogales Arizona	1000 feet of FM	4,726	$ 650,000	Geotechnical	6	$ 20,000	72

Information Naco, Sonora

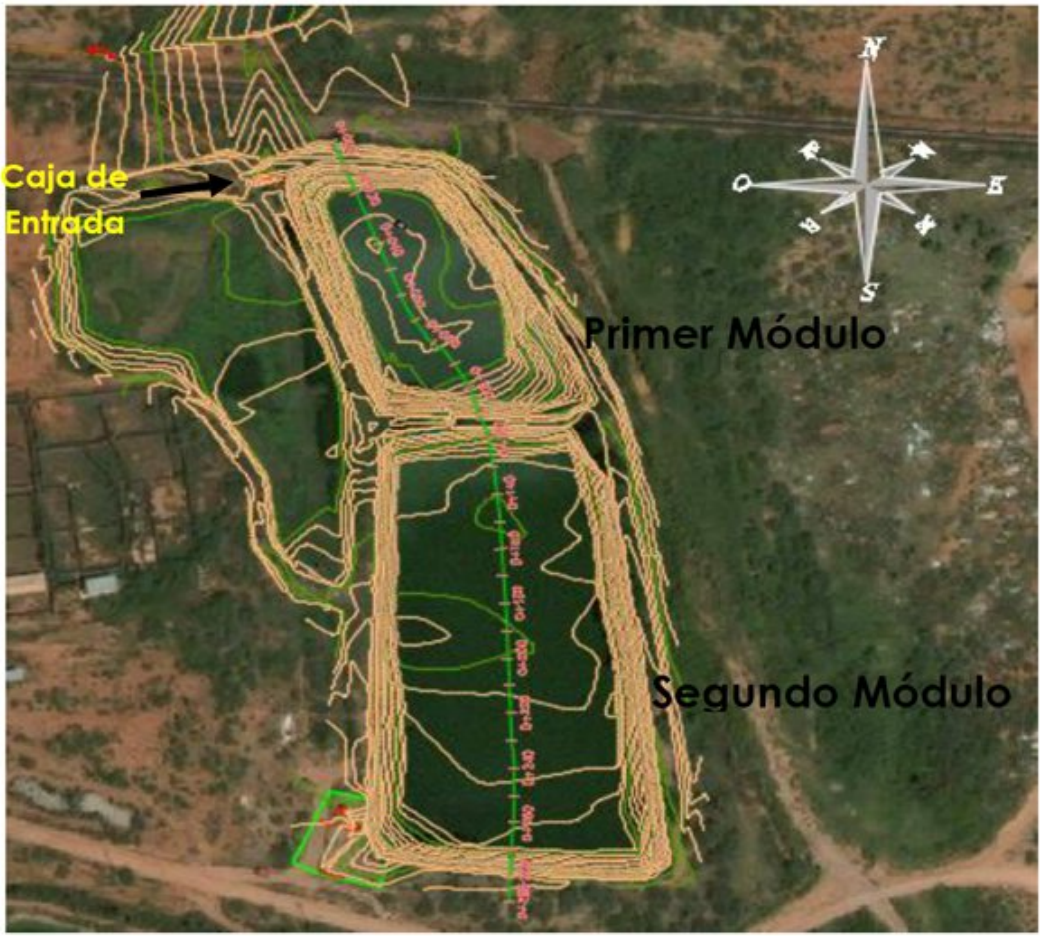
Background

	1996	2018	
Population	5,733	6,401	12%
Water consumption per capita per day			
Liters	250	**675**	170%
Gallons	66		
Average Potable Water Flowrate			
Liters per second	21	50	
Gallons per minute	333		
Average Waste Water Flowrate			
Liters per second	17	40	138%
Gallons per minute	266		

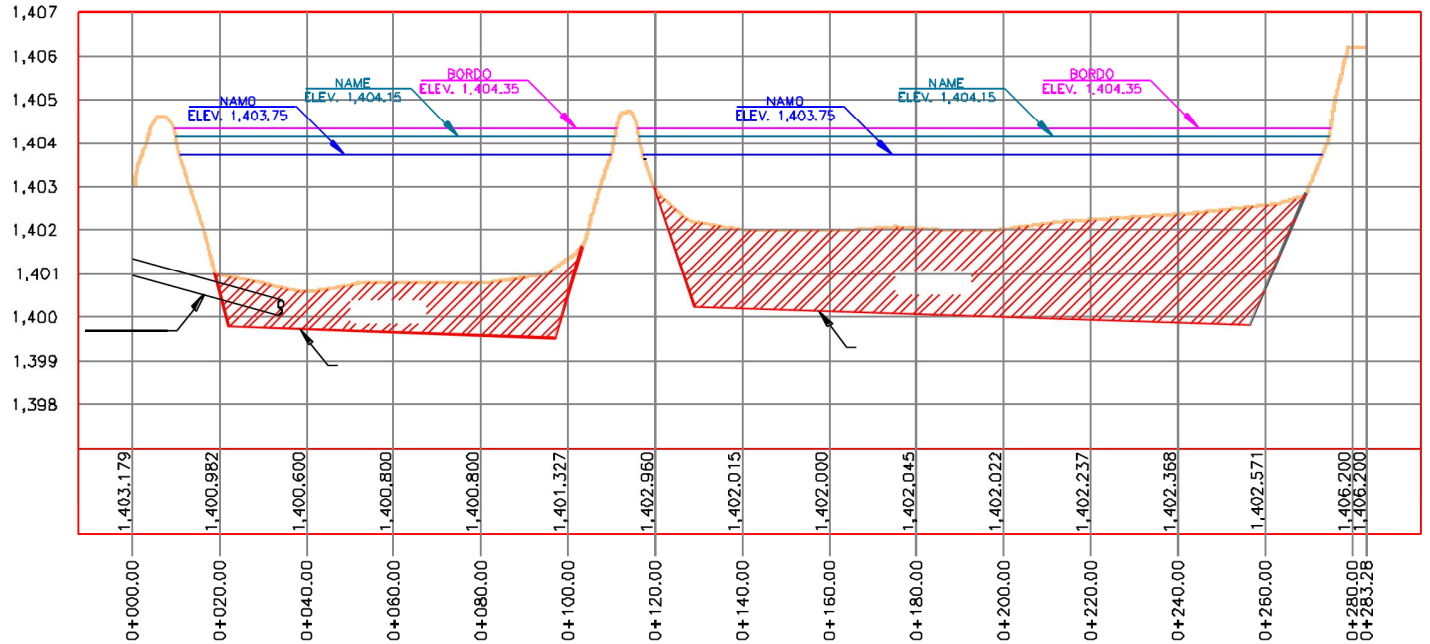
WW Flows per Hour - Naco, Sonora



East Lagoon System – Naco, Sonora



East Lagoon System – BATHYMETRY Study



PERFIL POR EL EJE DE LAS LAGUNAS DE OXIDACION, NACO

ESCALA HORIZONTAL 1 : 2500

ESCALA VERTICAL 1 : 250

Naco Transboundary Flow Monitoring Report

Prepared by North American Development Bank

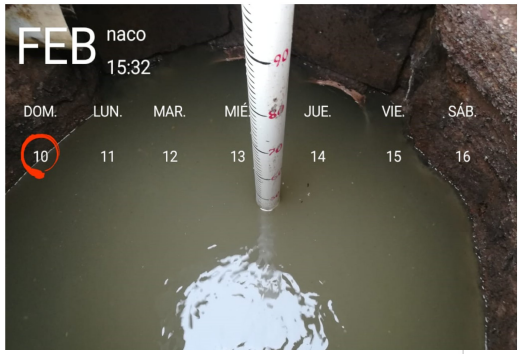
10-Feb-19

125 days to monsoon season

Weather 18 weeks

WW System Key Point Level Measurements -- TODAY

	Measurement	Target	Comments	Trend
Man hole #01 "Bad Muro"	16-inches (0.4 meters)	12-inches (0.3 meters)	Stable since 1/11	
East Lagoon	22-inches	Level Zero (1,414 m SL)	Slightly down	



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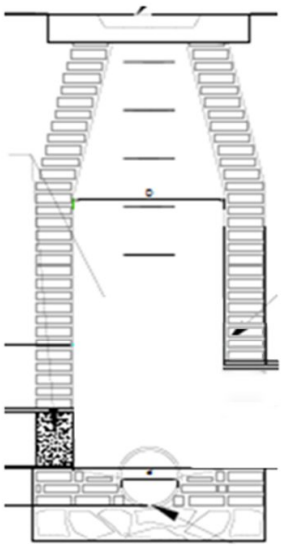

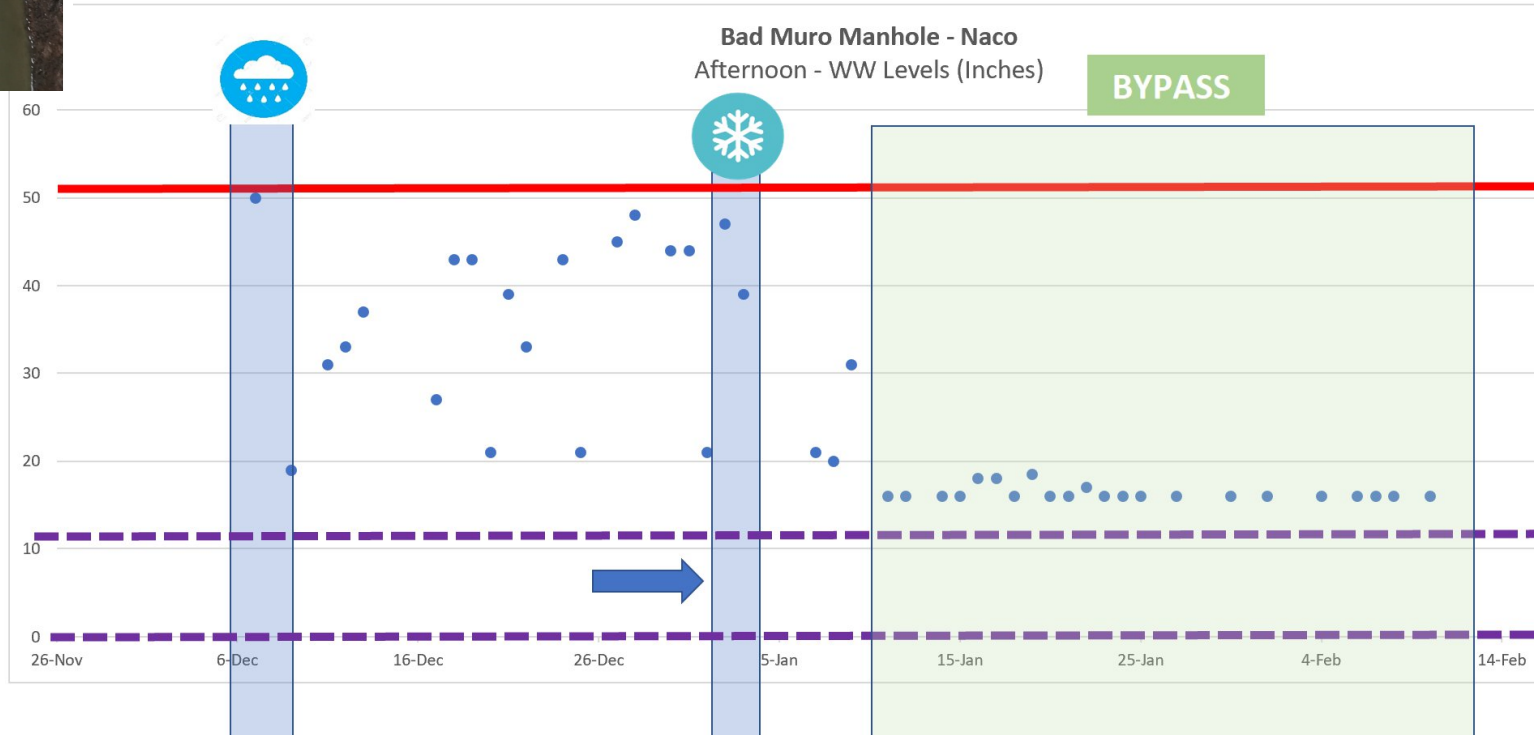

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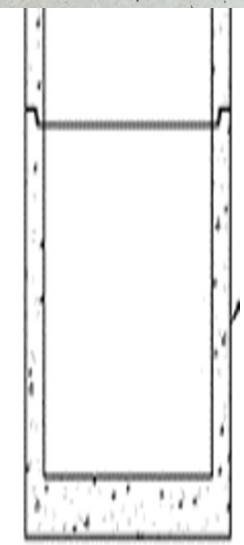
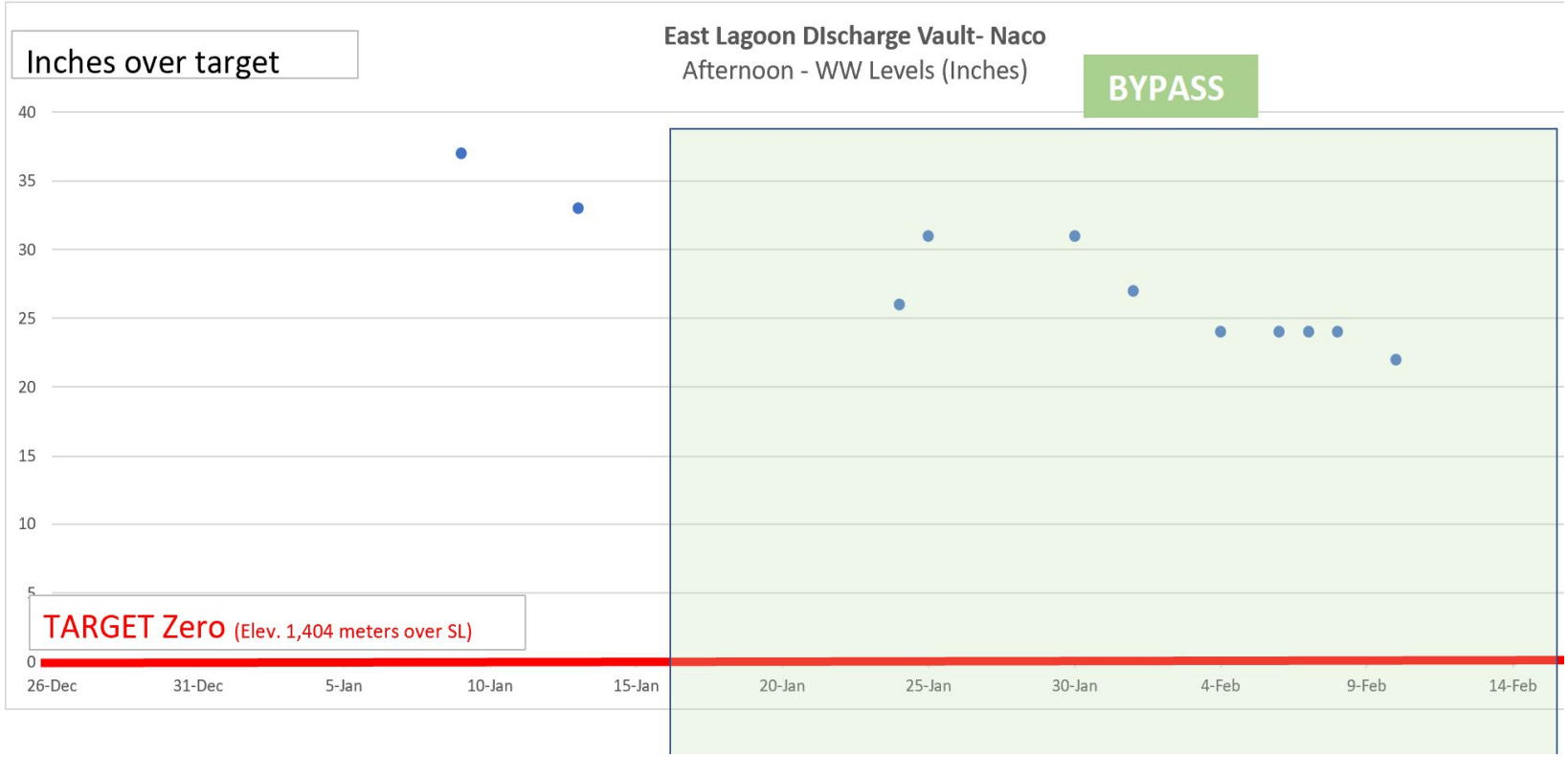


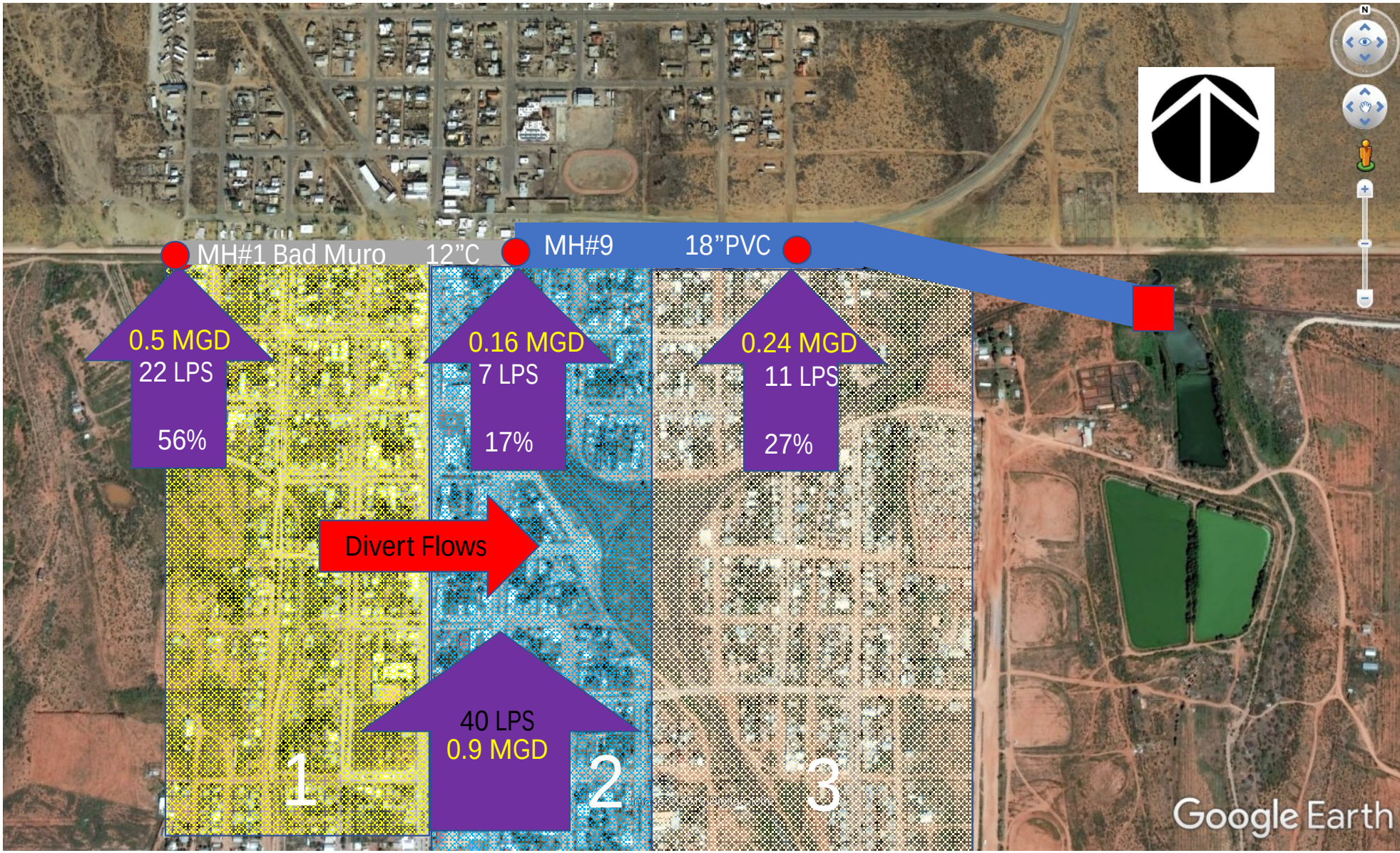


No TB WW flows from Naco, SON (east or west) since November 21, 2018

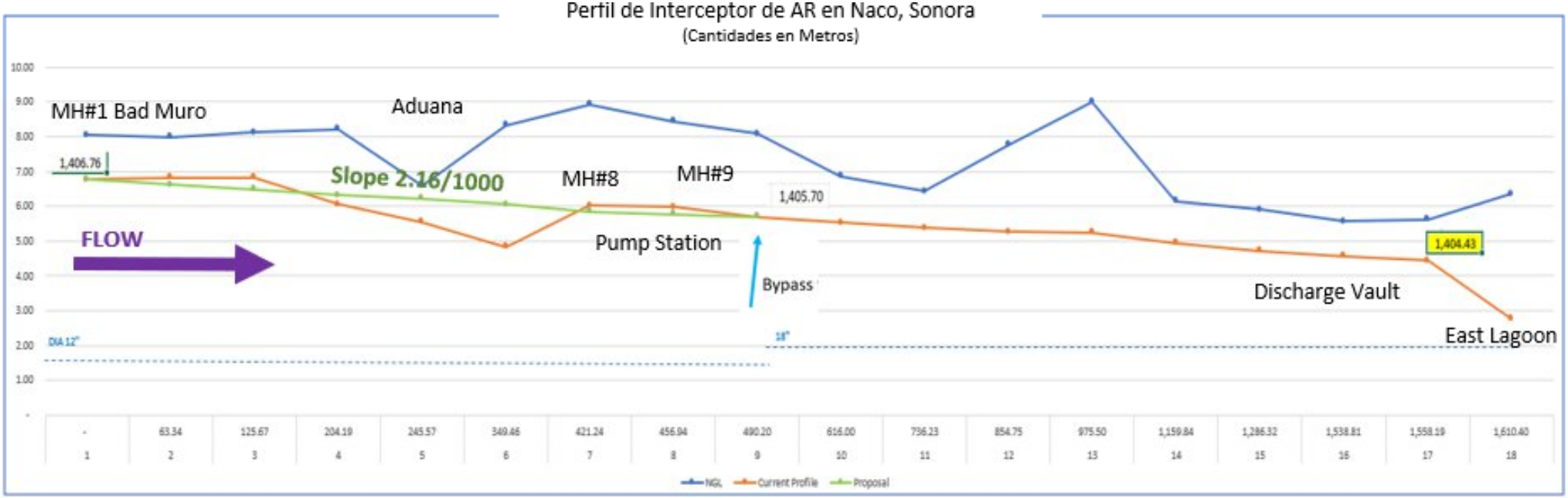
Actions

- ❑ 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)
- ❑ Coordination with CEA -procurement and construction (Dec 5 & 25, 2019)
- ❑ NADB proposed hiring Resident Engineer
- ❑ Technical Review with Resident Engineer/Supervisor (Dec 18, 19 and 25, 2018)
- ❑ Contracted Resident Engineer/Supervisor (Dec 28) to do the following:
  - Provide faster response/monitoring and lead cleaning/dredging actions
  - Provide technical support/engineering as necessary
  - Verify grade and flow directions in the northwest area of Naco (Bad Muro)
- ❑ 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 monitoring East Lagoon (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)
- ❑ Negotiated with CILA Mexican section to pay for Libertad Bypass US $5,000 approx.
- ❑ Started Lagoon Analysis coordination with CONAGUA

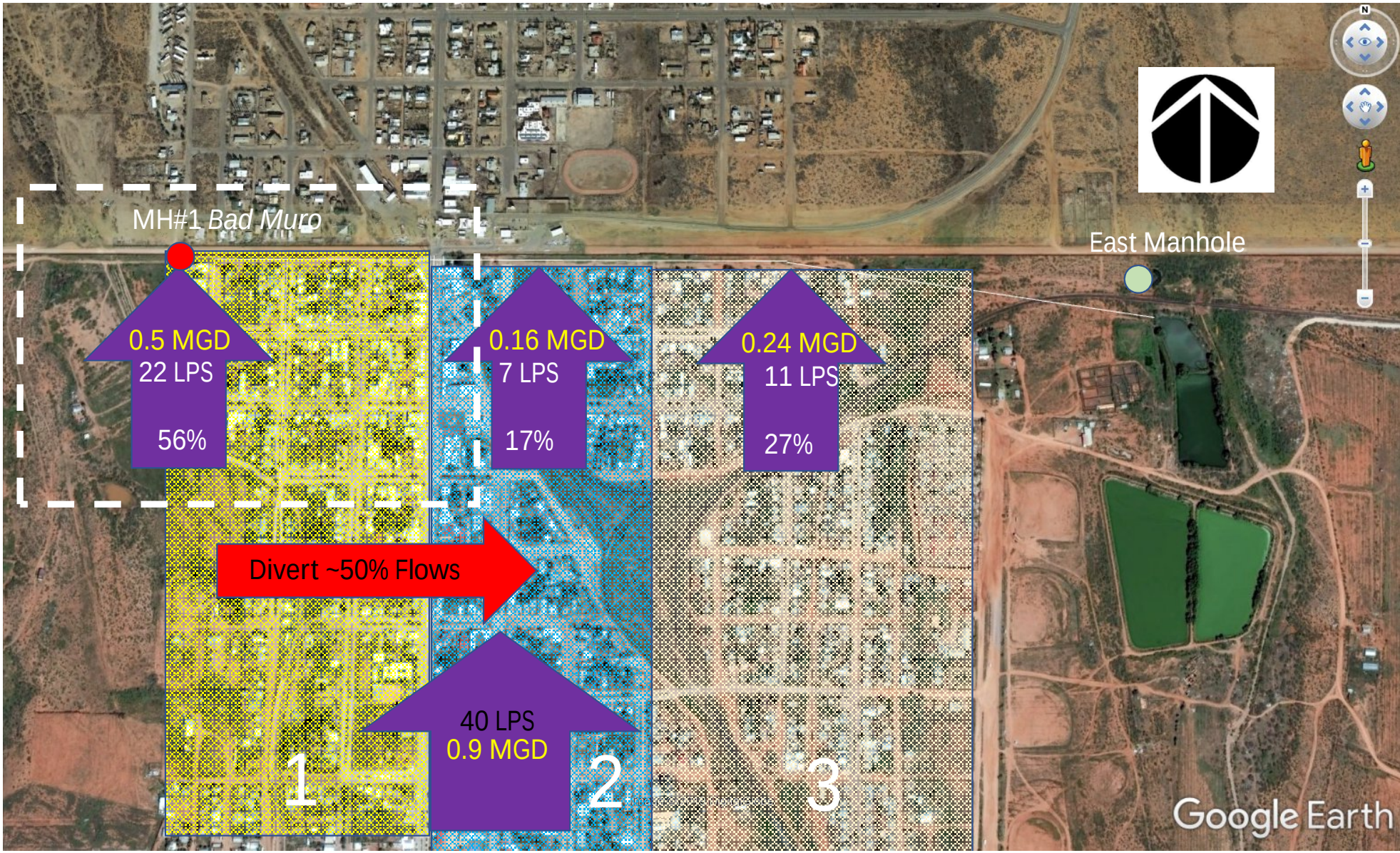
NACO
WW
FLOWS



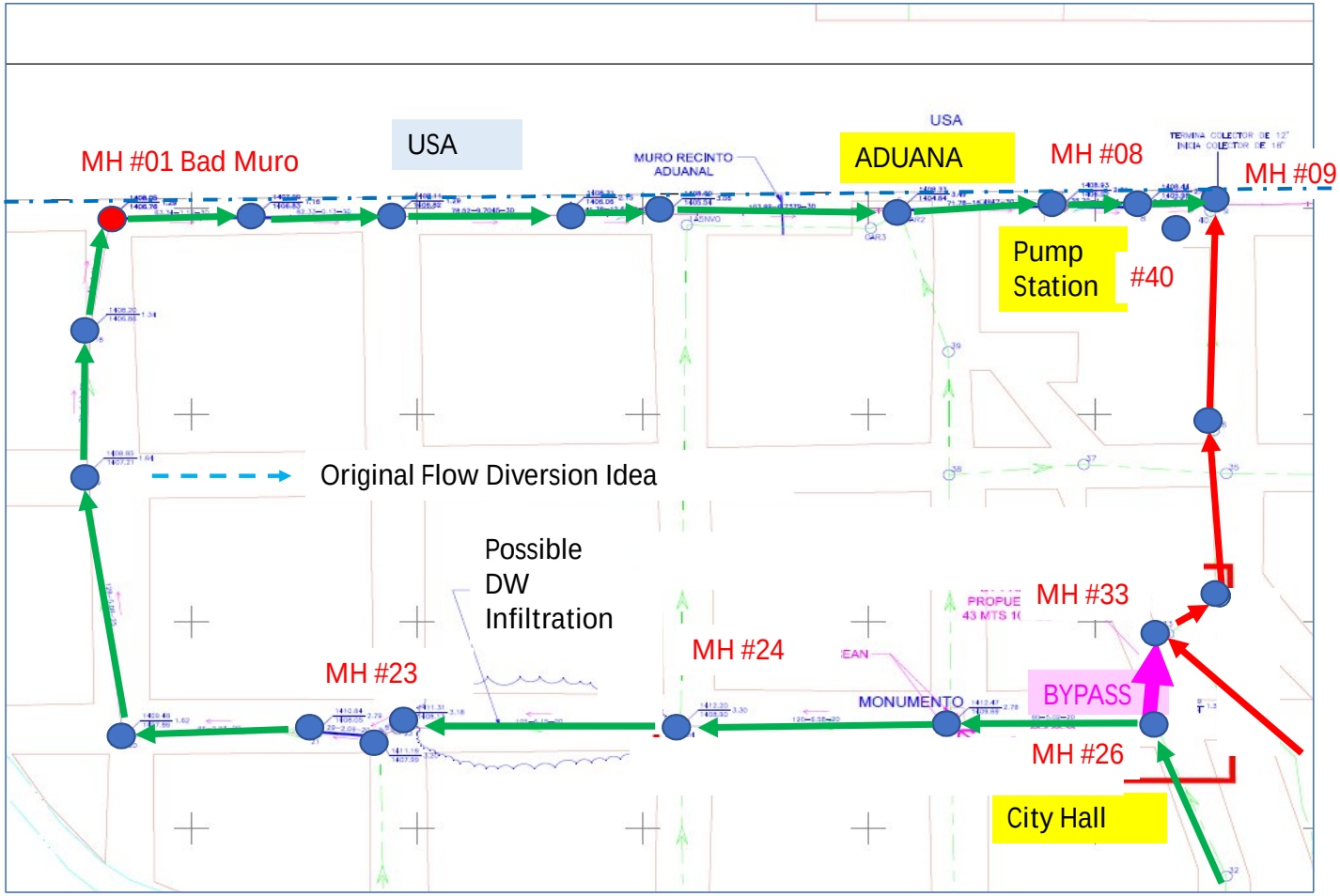
Proposed WW Interceptor Replacement Area (MH#1 to MH#9)



NACO
WW
FLOWS



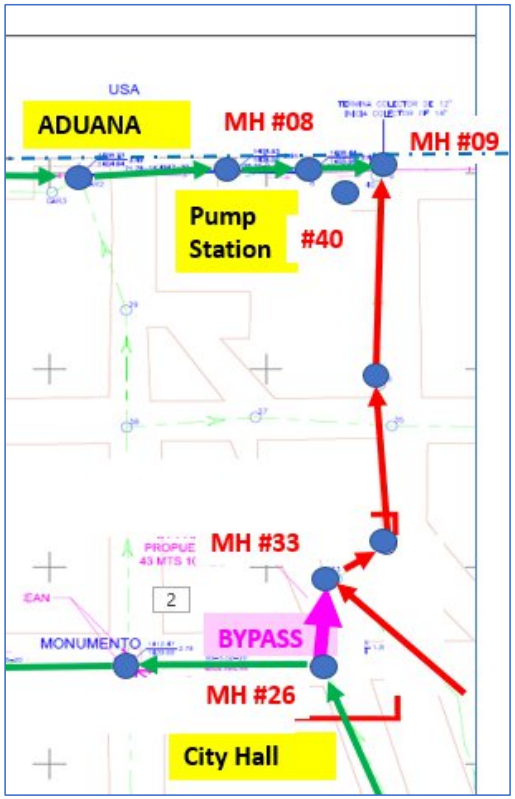
North West WWC Area Interceptor Bypass



Bypass Data
PVC Clase 20
10-inch
128 lps
capacity

Proposed Actions

- ❑ Continue monitoring MH#1, East Lagoon and MH#9
- ❑ Continue pipe cleaning
  - Connect MH#8 to MH#9 directly (remove #40)
  - Improve flows from MH#01 to MH#02 ….
- ❑ Rehab International Pump Station (NADB/ADEQ)?
- ❑ Identification of mid-term solution
  - Implement a redundancy system through by-passes (vs pump station)
  - Interceptor replacement MH #1 to MH #9 (approx. 450 meters)
    Cost Estimates (order of magnitude)
    Open Trench US$42,600
    Open Trench + Directional Drilling Aduana/INDABBIN
    US$ 178,000
  - Determine optimum solution for lagoon operations and discharge



REPLACE COLECTOR INTERNACIONAL (12-inch Dia)

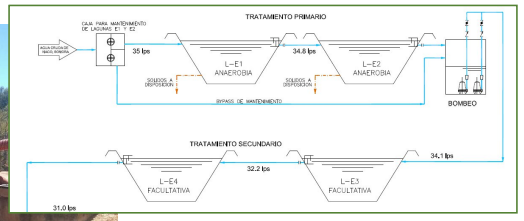
SCHEDULE

NACO, SONORA

	MAR				ABR				MAY				JUN				JUL				AUG			
	WEEKS																							
CONCEPT	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
OPEN TRENCH																								
DIRECTIONAL DRILLING																								

Photos

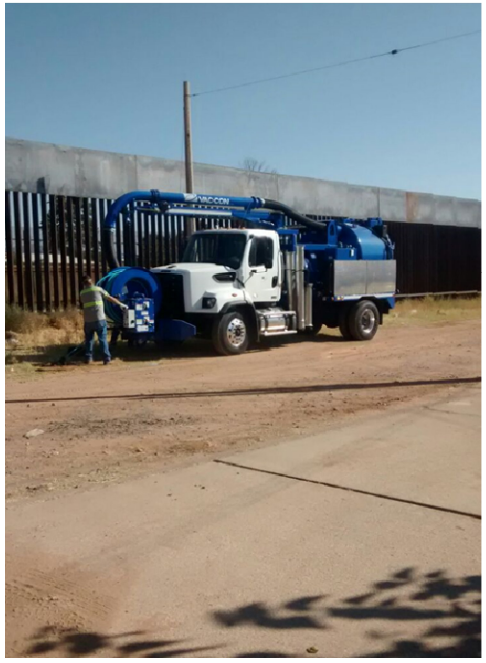
9/17 IBWCs pump in East Lagoon



9/17 Materials provided by NADB, Pump by CEA

Photos

10/17 NADB hires cleaning equipment and CEA donates pump



Photos

7/18 In coordination with ADEQ, NADB installs submersible pump and transformer in International Pump Station

8/18 CILA installs a second submersible pump in International Pump Station

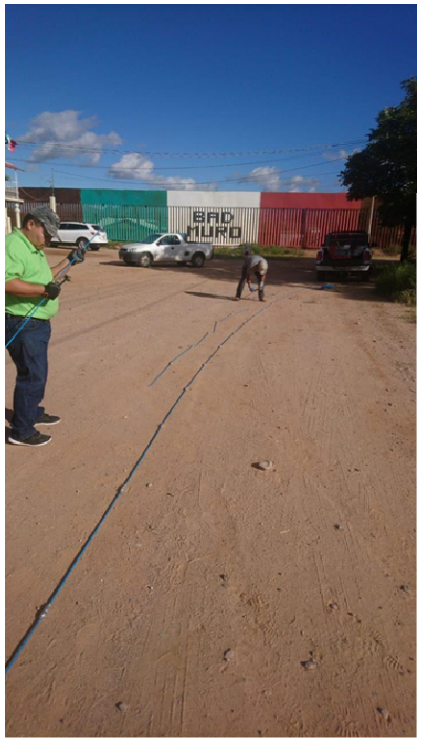
Photos

9/18 Force main fails and generates a discharge for several hours that is contained in the US side using berms.

Photos

9/18 CILA clean West interceptor using sewer cleaning rods (roto-probe) and finds a blockage east of the west man hole.

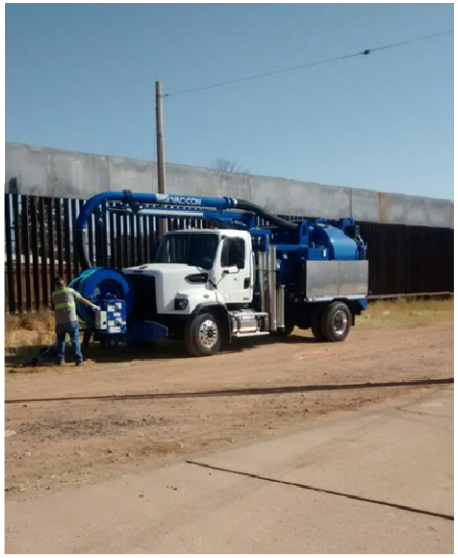
NADB in coordination with ADEQ provides machinery to excavate and remove the blockage.



Photos

11/18 NADB/ADEQ contracts a vacuum trucks from Nogales and covers expenses of CEA's truck to complete two weeks cleaning of West Interceptor.

WW Levels are reduced.

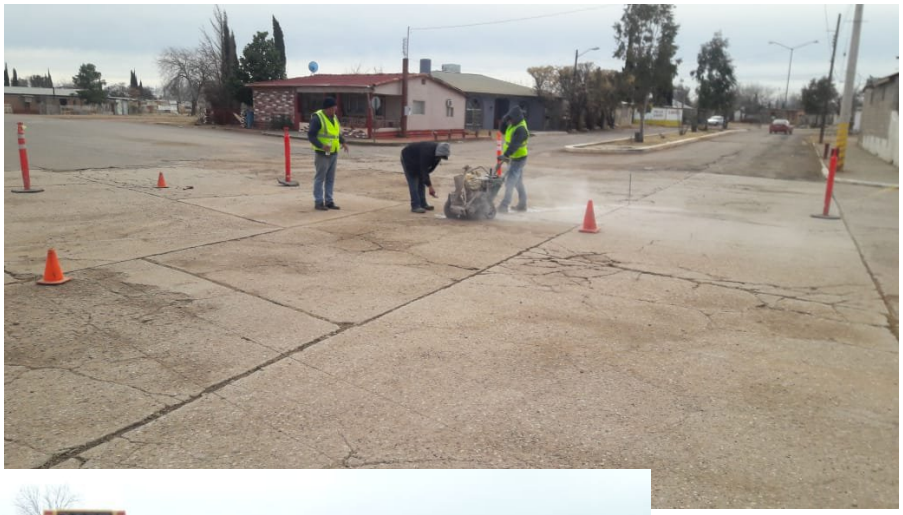


Transboundary Flow Mitigation
Naco, Sonora

Photographs

January 2019

Construction of Libertad Bypass to divert WW flows from West to East



Construction of Libertad Bypass to divert WW flows from West to East

Construction of Libertad Bypass to divert WW flows from West to East

Libertad Bypass completed and in operation (South to North view)

Monitoring Sewer Levels at Manhole #1 – BEFORE and AFTER the Bypass

East Lagoon Monitoring WW Levels at Discharge Vault

Sewer cleaning using a Vacuum-Water Jet truck – “Vactor Type”