EL PASO WATER'S USE OF MULTIPLE TRENCHLESS METHODS

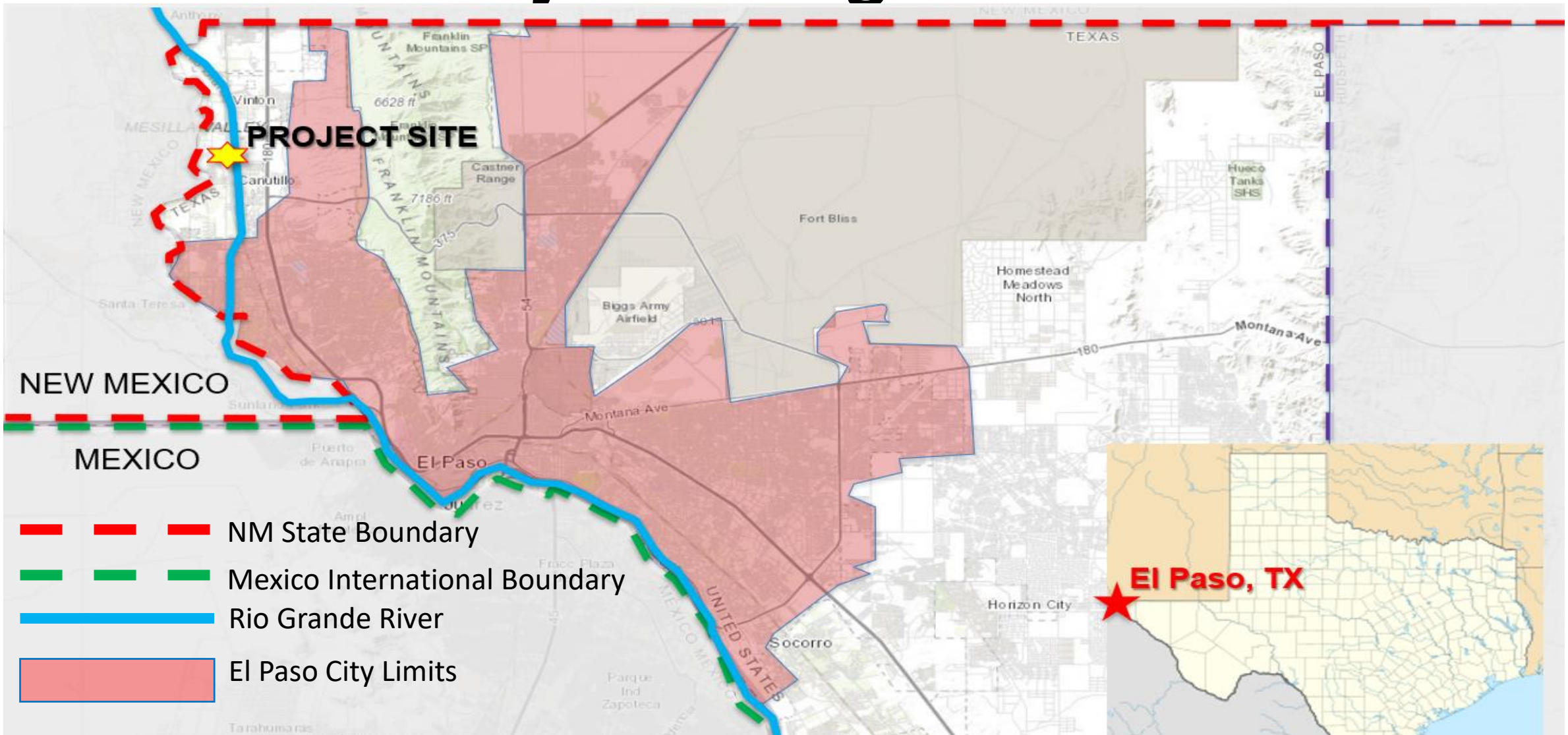
el paso WATER

Providing Cost & Time Savings to the Canutillo Bosque Road Lift Station and Force Main Project

Project Background

- Steady increase in water, wastewater service demand across El Paso, TX
  - 8.11% growth for El Paso county 2010-2020 (census)
  - 7.4% U.S. population growth 2010-2020 (Census)
- Providing service is challenging due to unique geographic location
  - New Mexico State border to north
  - Rio Grande River to West
  - International boundary with Mexico to South
  - Franklin Mountains bisect the City

Project Background




DesertShot Inc.
DesertShot, Inc.
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Project Background

Service request

- Neighboring communities have experienced similar growth
- Private water systems often overwhelmed by growth exceeding capacity
- Canutillo School District operated, maintained wastewater treatment plant servicing a school
- Village of Vinton private water system lacked capacity for increased demand
- Requested service from EPWater
- Outside EPWater service area

Project Background

Service request

- Pumping lift station needed to provide service to both entities
- Funding was secured and all parties entered into participation agreements for EPWater to construct new sanitary sewer lift station and force main

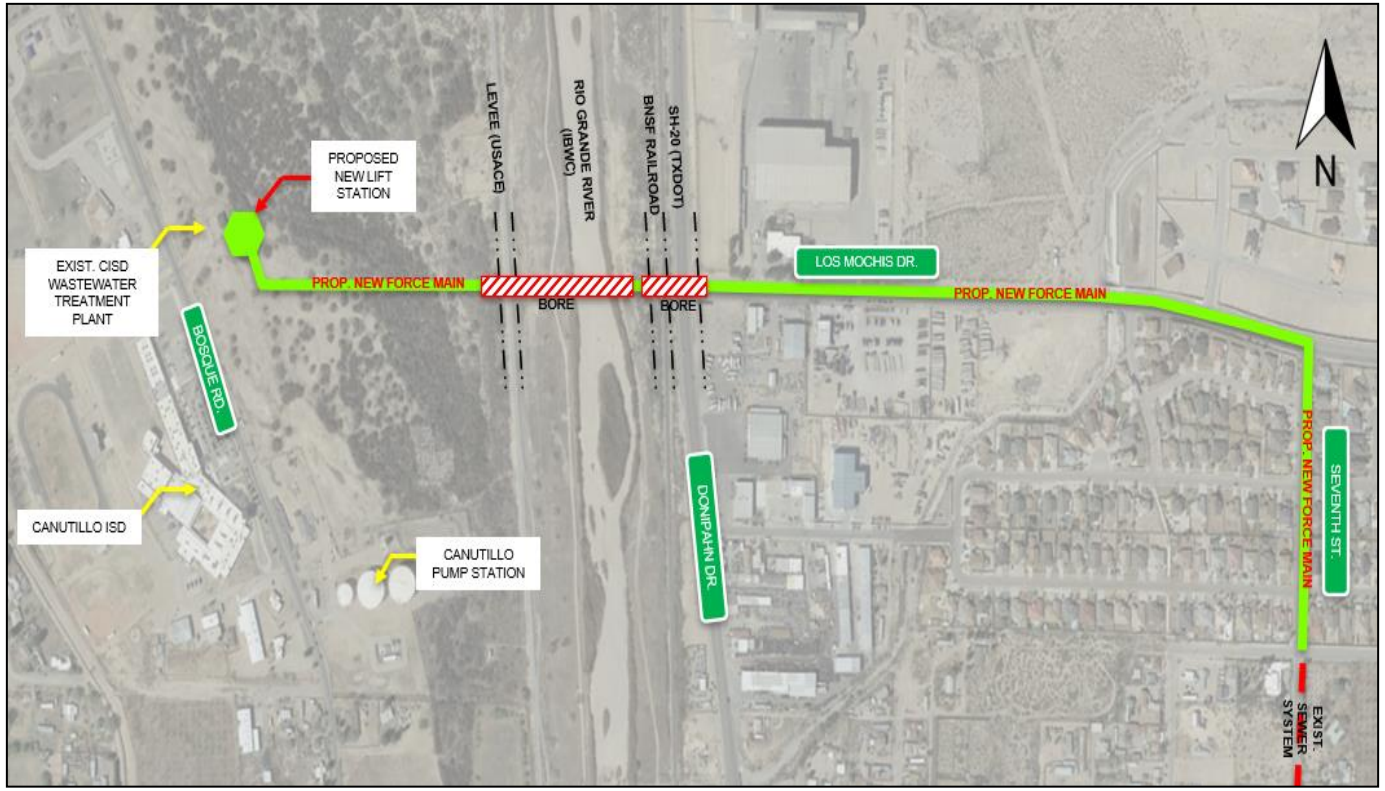
Scope of work

- Construct sanitary sewer pumping lift station (LS)
- Install sanitary sewer force main

Design Challenges

Location

- LS is west of the river, outside corporate city limits (no sewer service available)
- Discharge point of new FM = just under 6,400 LF
- Initial low flows into LS
- LS design capable of upsizing into larger, regional LS



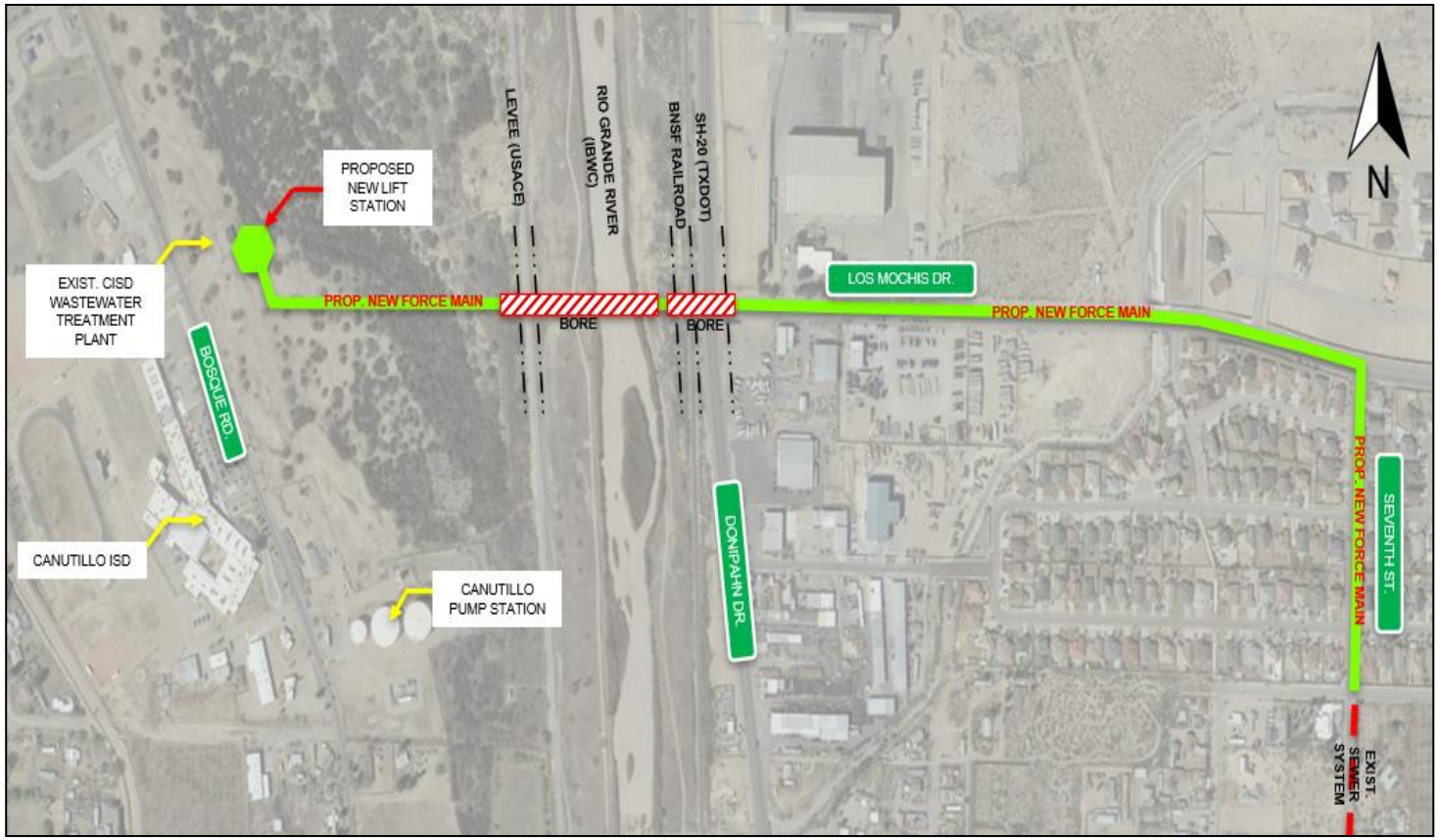
Design Challenges

Site Conditions

- High groundwater table
- Dewatering discharge location
- Coordination & permitting with various entities
  - USACE
  - IBWC
  - BNSF
  - TXDOT

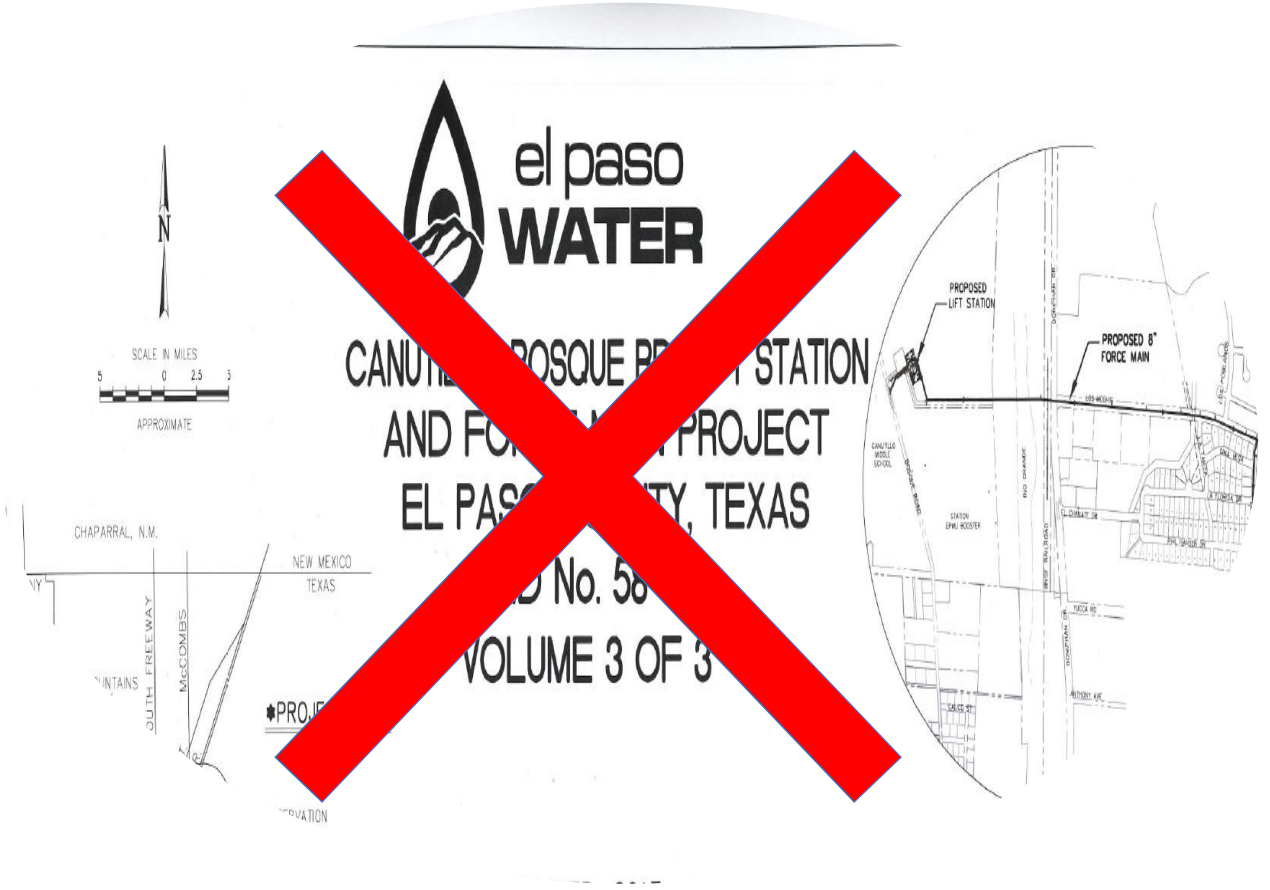
First Attempt

- Grantors of easements/ licenses imposed various constructability restrictions
- Design opted for two long, continuous bores: 700 LF & 214 LF
- Required extensive dewater-ing; discharge point unclear



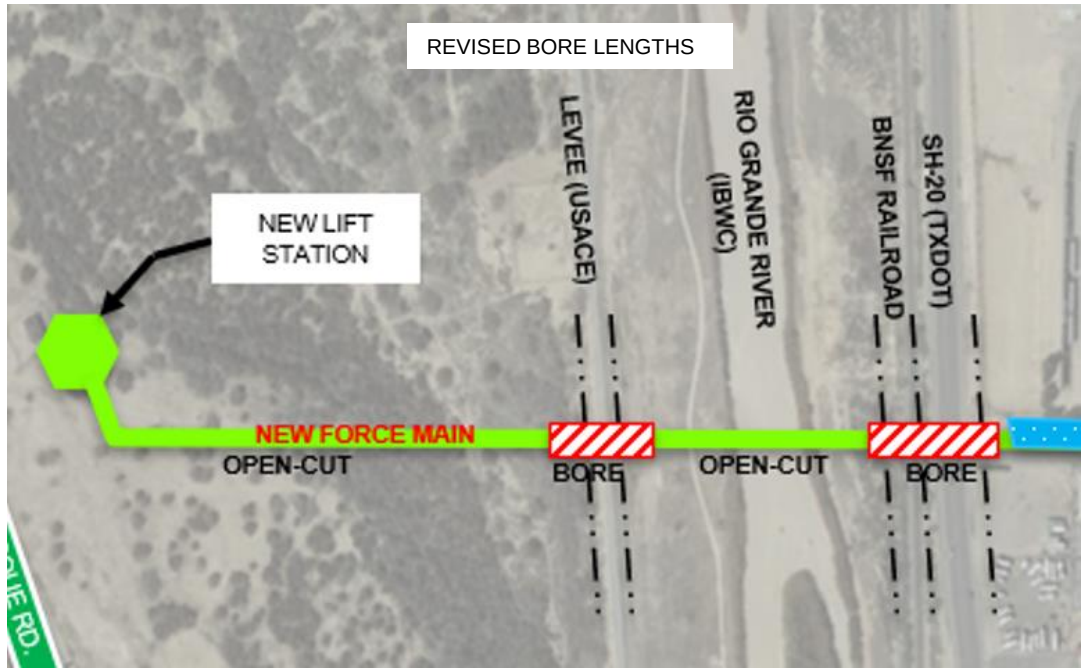
First Attempt

- Construction community concerned over design & constructability
- Unsuccessful bid: 79%-124% above Engineers OPC
- All bids rejected
- Project deemed complex and thus too risky
- Time of year project was advertised also played a role



Second Attempt

- Design team revisited project approach to simplify scope of work
- Outreach to identify key risk areas
  - Length of bores across river & RR
  - Extensive dewatering
- Installation variance was requested and approved by IBWC
  - Open cut in lieu of boring across river
  - 140 LF bore vs. 700 LF



Second Attempt

- Seasonal River translates to fluctuating groundwater table elevation
- Water supply in river available during irrigation season (March to October)
- Sequencing of work (e.g., river crossing) during non-irrigation season

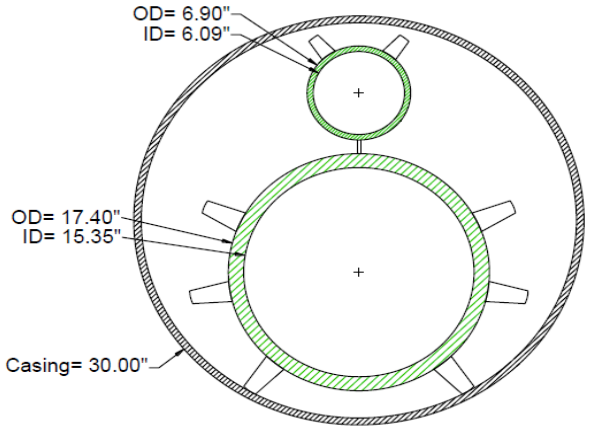
  - Reduced amount of dewatering necessary

  - Discharge of dewatering directly into river (less risk for aquatic life)

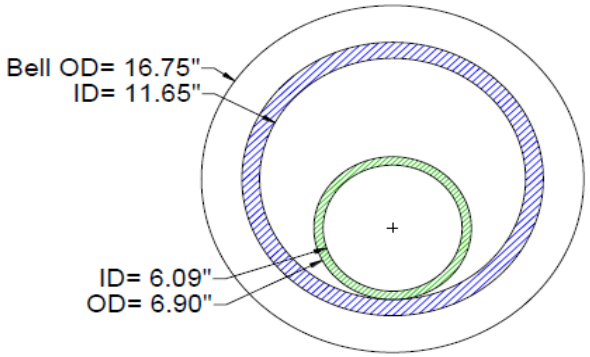
  - Use of auger-boring trenchless install

Second Attempt

- Specified fusible PVC as required FM material; “Piggy-Back” install
- Identified abandoned, dry 12” PVC line



6" DR 18 FPVC® & 16" DR 18 FPVC®
Inside 30" Steel Casing with Spacers



6" DR 18 FPVC® Inside
12" DR 18 B&S PVC Casing

Summary Design Changes

IDENTIFY KEY RISKS AREAS	FM ALIGNMENT	SEQUENCING AND AGENCY COORD.
SHORTENED BORE LENGTHS	SPECIFIED FPVC FOR SPECIFIC SEGMENTS	REQ. CONSTRUCTION DURING “DRY RIVER” CONDITIONS
DEWATERING	SLIPLINE INSTALL	INSTALLATION VARIANCE APPROVED

Successful Bid

- Design revisions attracted more competitive bids
- Winning bid was 13% lower than engineers estimate

Construction

Dewatering

- System set up to discharge downstream of the river crossing
- Water samples obtained and tested to ensure quality was within TCEQ parameters
- Drawdown of the groundwater table was less complicated with no river water present

Construction

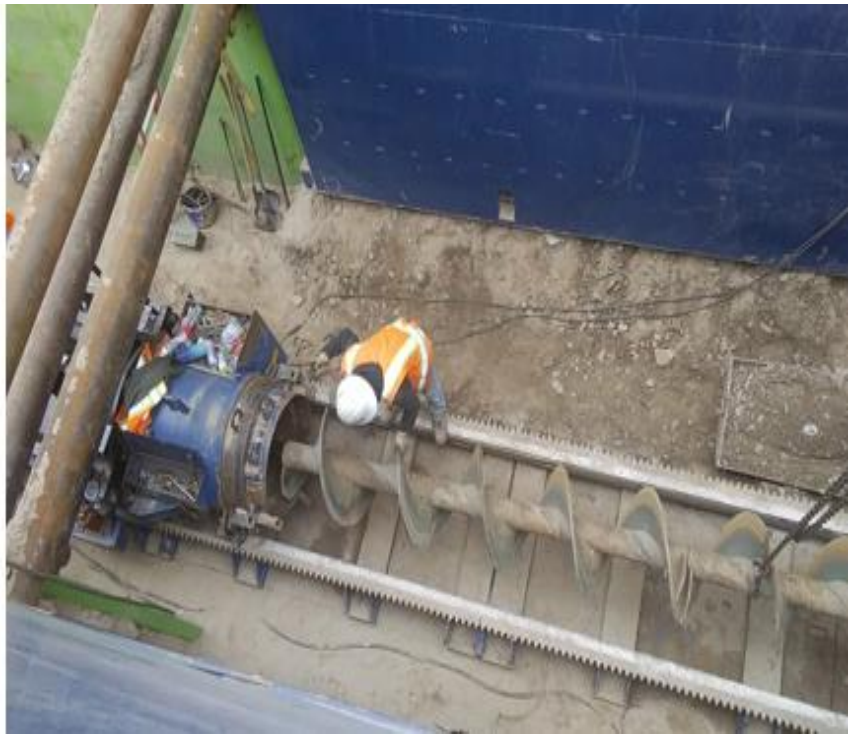
Forcemain Install

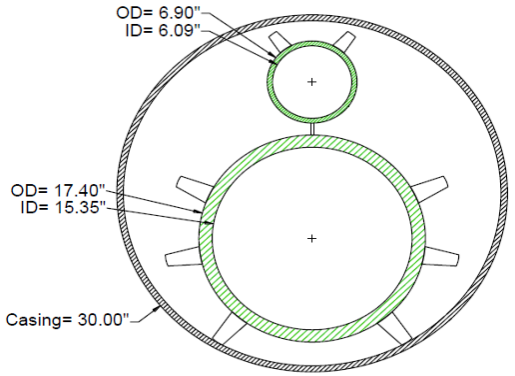
- Fusible PVC was used
- Accelerated installation process

Construction

Bores

- 2 bores (140 LF & 200 LF)
- 30” steel casing with 16” and 6” FPVC carrier pipes





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Construction

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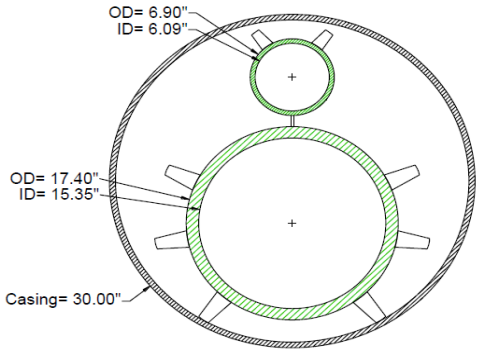

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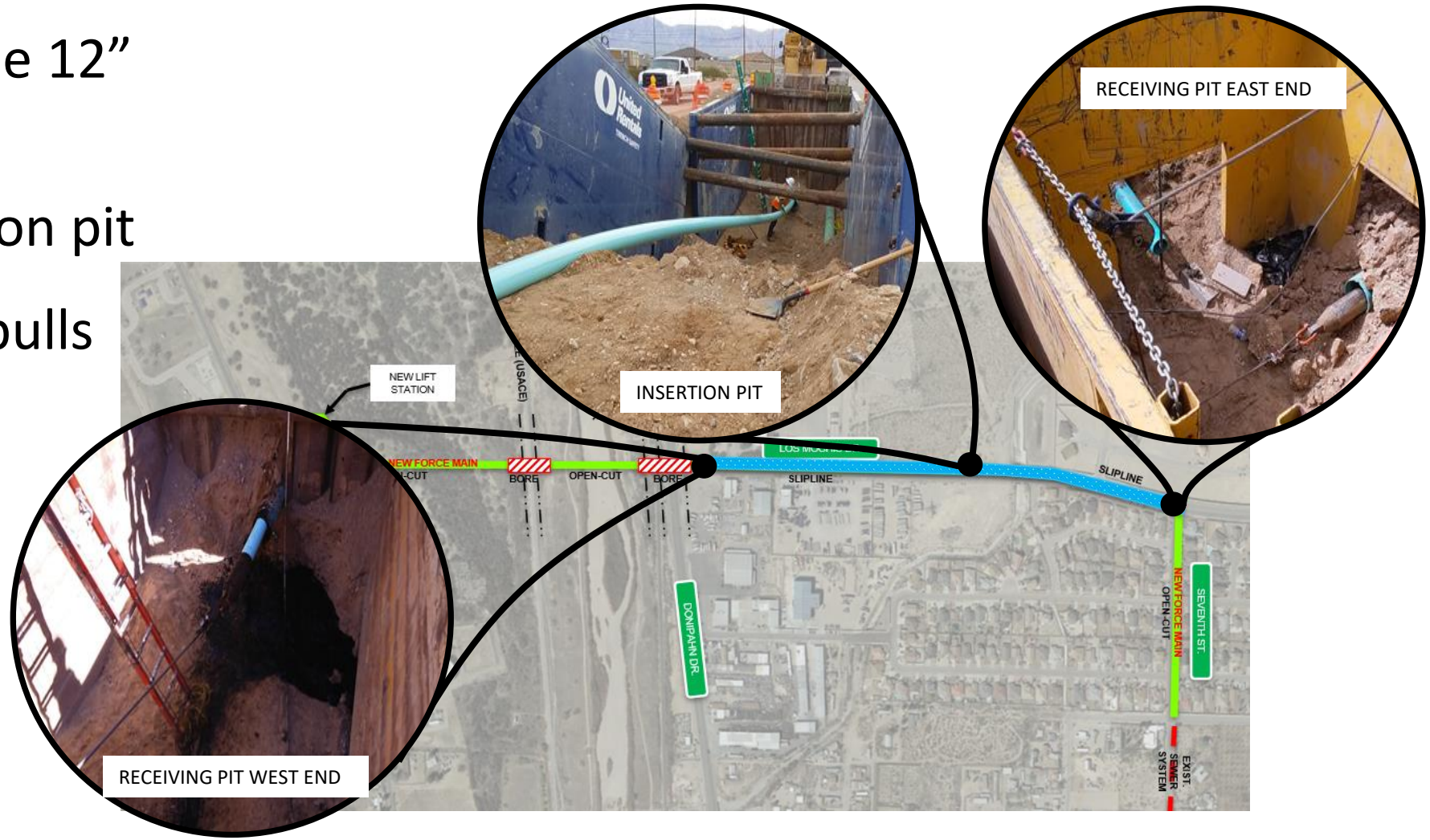
Construction

Slipline

- 6” FPVC inside 12” PVC
- Single insertion pit
- (2) 1,400 LF pulls



Construction

Slipline

- Less traffic control and trenching
- Repaved insertion and receiving pits only, not entire street

Construction

Open Cut:

- Traditional method
- Experienced trench wall failures undermining existing roadway
- Extensive traffic control needed, more inconvenience to community.

Multiple Trenchless Technologies Used

SLIPLINE

HORIZONTAL AUGER BORING

FUSIBLE PVC

TIME AND COST SAVINGS

Benefits of Multiple Trenchless Technologies

CASE STUDY LESSONS LEARNED

TIME

- Faster installation
- Reduction in overall construction duration
- Less impact to community

COST

- Shorter duration translates to cost savings
- Less pavement restoration required
- Ability to choose between various trenchless technologies in a Low Bid procurement resulted in more competitive bids

The Canutillo Bosque LS and FM Project resulted in a project that was developed to meet its design intent in a way that is both innovative and fiscally responsible.

Questions?

Ivan Hernandez, P.E.
Engineering Division Manager | Construction Project Management
El Paso Water
T: (915) 594-5560|M: (915) 487-1286
ihernandez@epwater.org

Shawn M. Garcia, P.E.
Regional Manager
Underground Solutions/Aegion
M: (817) 320-6582
sgarcia@aegion.com