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BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION

IN THE MATTER OF NEW MEXICO WATER SERVICE COMPANY'S APPLICATION FOR APPROVALS OF REVISED RATES PURSUANT TO ADVICE NOTICE NO. 23, FOURTEENTH REVISED RATE NOS. 1, 2, AND 4 AND FIRST REVISED RATE NO. 5	)	**Case No._____**
NEW MEXICO WATER SERVICE COMPANY,	)	
APPLICANT.	)	

DIRECT TESTIMONY

OF

DALE TAFOYA

ON BEHALF OF
NEW MEXICO WATER SERVICE COMPANY

June 26, 2026

NMPRC CASE NO.

DIRECT TESTIMONY OF DALE TAFOYA
ON BEHALF OF
NEW MEXICO WATER SERVICE COMPANY

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME, POSITION, AND BUSINESS ADDRESS.

A. My name is Dale Tafoya. I am employed by New Mexico Water Service Company ("Company") as Wastewater Supervisor/Superintendent. My business address is 401 Horner Street, Rio Communities, New Mexico 87002.

Q. WHAT ARE YOUR RESPONSIBILITIES?

A. My responsibilities include wastewater system engineering, planning, capital project development, regulatory compliance, and operational support for the Company's systems, including the Rio Sewer District wastewater system.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to describe the Company's Rio Sewer District wastewater system, summarize capital improvements made and planned, and demonstrate that these investments are prudent and necessary to provide safe and reliable wastewater service in compliance with applicable regulations in New Mexico.

Q: DO YOU SPONSOR ANY EXHIBITS AS PART OF YOUR TESTIMONY?

A. Yes.

DT-1 – Water Works Engineers RDO Master Plan Update, January 2025

DT-2 – Rio Communities Wastewater Treatment Plant NPDES Permit No. NM0027782

DT-3 – Rio Del Oro Wastewater Treatment Plant NPDES Permit No. NM0030414

II. RIO SEWER DISTRICT SEWER SYSTEM DESCRIPTION

Q. PLEASE DESCRIBE THE RIO SEWER DISTRICT SEWER SYSTEM.

A. The Rio Sewer District sewer system consists of two wastewater treatment facilities, the Rio and Rio Del Oro Wastewater Treatment Plants ("Rio" and "RDO", respectively) with their associated collection systems that serve customers within the Rio Communities development, the Rio Grande Industrial Park, and outlying areas in Valencia County, New Mexico. The system is designed to collect, convey, treat, and safely dispose of or reuse wastewater in compliance with applicable environmental and public health standards. The Rio plant serves the customers in Rio Communities and the Rio Grande Industrial Park and the RDO plant serves the outlying areas in Valencia County within the Rio Sewer District.

Q. WHAT ARE THE KEY COMPONENTS OF THE SYSTEM?

A. Key components of each facility include gravity sewer lines, force mains, pump stations, treatment processes, storage or lagoons (if applicable), and discharge or reuse infrastructure. These components work together to ensure reliable wastewater service.

III. ANTICIPATED GROWTH

Q: DOES NMWSC ANTICIPATE GROWTH IN THE RIO SEWER DISTRICT REGARDING NEW CONNECTIONS?

Q: Yes. We have pending requests for 240 new connections to the RDO plant and 50 requests for new connections to the Rio plant.

Q: WILL THE NEW CONNECTIONS AT EACH PLANT REQUIRE CAPITAL IMPROVEMENTS AT EACH PLANT?

A: Yes.

IV. CAPITAL IMPROVEMENTS TO THE RIO DEL ORO PLANT

Q. PLEASE EXPLAIN THE HISTORY OF THE RIO DEL ORO WASTEWATER PLANT.

A. The RDO Wastewater Treatment Plant was originally constructed in approximately 1985 by Rio Grande Utility Corporation, New Mexico Water's predecessor-in-interest. The plant was upgraded to a Membrane Bioreactor ("MBR") technology plant in 2004. The plant currently serves seven developments and five schools, including the University of New Mexico, Valencia Campus.

Q. PLEASE DESCRIBE CAPITAL IMPROVEMENTS TO THE RIO DEL ORO PLANT.

A. NMWSC's Capital Improvement Plan ("CIP") for RDO is detailed in Exhibit DT-1, the Water Works Engineers RDO Master Plan Update dated January, 2025. NMWSC's CIP for RDO to service existing and new, approved connections totals $5.6 million. *See* Ex. DT-1, Exec. Summ. These improvements include upgrades to the influent lift station and force main, biological treatment, and effluent pump station. *See* Ex. DT-1, Appendix D.

Q. WHAT IS THE STATUS OF THESE UPGRADES?

A. The improvements and upgrades described in the Application and my Direct Testimony are already underway with Phase 1 construction partially completed, including upsizing permeate pumps, increasing piping size, upgrading Variable Frequency Drive ("VFD") controls, and changing MBR filters. The remaining Phase 1 construction is scheduled for completion in late 2026, and includes:

- Installation of new influent lift station
- Installation of new effluent lift station
- De-nitrification of anoxic zones
- Increasing the size of the UV system
- Installation of new blower system

Additional improvements will be required to meet 2030 projected development and are planned to be made as development is added beyond existing and committed customers.

Q. WHY WERE THESE IMPROVEMENTS TO THE RIO DEL ORO PLANT NECESSARY?

A. These investments were necessary to ensure continued compliance with environmental regulations, maintain service reliability, reduce the risk of system failures, support existing and future customer needs, and to increase system capacity for the above-described new connections to the RDO plant.

Q. WERE THESE INVESTMENTS PRUDENTLY INCURRED?

A. Yes. All investments were evaluated, planned, and executed consistent with sound engineering judgment, industry standards, and regulatory requirements, and are used and useful in providing wastewater service.

V. CAPITAL IMPROVEMENTS TO THE RIO PLANT

Q. PLEASE EXPLAIN THE HISTORY OF THE RIO PLANT.

A. The Rio plant was constructed in 1985, also by New Mexico Water's predecessor in interest – Rio Grande Utility Corporation. Between 1997 and 2001, the plant underwent an expansion of its secondary clarifier and UV disinfection capabilities. In 2009, a digester and centrifuge building were added to the facility. The plant currently serves twenty-four developments with 2,091 active connections, an elementary school, and twenty non-residential connections (eight commercial and twelve industrial).

Q. PLEASE DESCRIBE CAPITAL IMPROVEMENTS TO THE RIO PLANT.

A. NMWSC is currently developing and evaluating a capital improvement plan for the Rio plant, and any representations concerning the Rio plant capital improvement plan in this Testimony are based on early estimates from third-parties and subject to revision. As of May, 2026, NMWSC received estimates that to accommodate future growth, including the 50 committed EDUs, to replace aging components, and to ensure regulatory compliance within the Rio plant's service area to 2030, will require capital improvements totaling approximately $2.7 million. These include upgrades to the collection system's lift station, the influent pump station,

headworks, aeration, disinfection and outfall, and other system components. No construction has commenced on these improvements.

Q. WHY ARE THESE IMPROVEMENTS TO THE RIO PLANT NECESSARY?

A. These investments are necessary to ensure continued compliance with environmental regulations, maintain service reliability, reduce the risk of system failures, support existing and future customer needs, and to increase system capacity for the above-described new connections to the Rio plant.

Q. WILL THESE INVESTMENTS BE PRUDENTLY INCURRED?

A. Yes. All investments are being evaluated, planned, and executed consistent with sound engineering judgment, industry standards, and regulatory requirements, and are used and useful in providing wastewater service.

V. REGULATORY COMPLIANCE

Q. DOES THE RIO SEWER DISTRICT SEWER SYSTEM COMPLY WITH APPLICABLE REGULATIONS?

A. Yes. The system is operated in compliance with applicable federal and New Mexico regulations, including requirements governing wastewater treatment, discharge permits, and environmental protections. *See* Exhibits DT-2 and DT-3 (EPA NPDES Permits for Rio and RDO plants, respectively).

Q. HOW DO CAPITAL IMPROVEMENTS SUPPORT COMPLIANCE?

A. Capital improvements are essential to maintaining compliance by upgrading infrastructure, improving treatment performance, and ensuring that the system meets evolving regulatory standards.

V. CONCLUSION

Q. DOES THIS CONCLUDE YOUR TESTIMONY AT THIS TIME?

A. Yes, it does.

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ELECTRONICALLY SUBMITTED VERIFICATION

Dale Tafoya, under penalty of perjury under the laws of the State of New Mexico, states:

1. I make this verification pursuant to 1.2.2.10(E) NMAC and New Mexico R. 1-011(B) NMRA.

2. I have read and am familiar with the foregoing *Direct Testimony of Dale Tafoya*, and the statements therein are true and correct based on my personal knowledge and belief.

Dated: 06/24/26 */s/ Dale Tafoya*
Dale Tafoya

New Mexico Water Service
Rio Del Oro Sanitary Sewer System
Master Plan Update

Date: January 2025
Prepared by: Celina Freeman, EIT
Anthony Baltazar, PE
Mohsen Karbakhsh, PE
Mike Fisher, PE

Reviewed by: David Kopchynski, PhD, PE

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1. Executive Summary

In this report, Water Works Engineers (Water Works) evaluated the existing New Mexico Water Service (NMWS) Rio Del Oro (RDO) Sanitary Sewer (SS) collection and treatment systems (System) and developed engineering recommendations and costs to accommodate existing and future system needs. The RDO SS system currently serves seven (7) developments, five (5) school campuses, and 1,455 active SS residential connections or Equivalent Dwelling Unit (EDU). Five (5) lift stations feed into a common downstream gravity collection system, which enters the plant using an influent lift station (college lift station). Water Works performed a hydraulic capacity assessment of the collection system and treatment plant, as well as process evaluations of the treatment plant, to identify recommended upgrades and costs to meet the existing and future system needs. Below is a summary of this report's findings.

Collection System

The RDO collection system involves five (5) lift stations that collect sewage from the upstream developments. Collected pressure sewage is fed into a gravity system consisting of mainly 12" and 15" PVC interceptors. Upon arrival at the treatment plant (southwest of collection system), the flow is sent to an influent lift station, using an 8" PVC gravity, before being pumped to the Wastewater Treatment Plant (WWTP). The following is a list of improvement recommendations needed to meet additional capacity demand:

- Install a new influent lift station and forcemain at the treatment plant and downstream of the existing 15" PVC interceptor, to avoid overwhelming the existing 8" PVC during peak hours. This lift station and 8" PVC is currently at capacity and require improvements to accommodate any future connections.
- Install a new gravity (minimum 15" PVC) interceptor along the Manzano Expressway to accommodate additional flow, and to divert flow from entering the existing 15" PVC . This will prevent surcharging of the existing 15" PVC interceptor.
- Evaluate and improve the Manzerro lift station to be able to handle BO flow conditions.

Wastewater Treatment System

The Rio Del Oro Wastewater Treatment Plant has an Annual Average Day (AAD) flow of 0.20 MGD and Average Day Maximum Month (ADMM) capacity of 0.30 MGD, which is equal to the existing MBR capacity for peak conditions. With the development committed to through fully executed Line Extension Agreements (LEA), and additional connections that are projected in the near future, these flows are projected to increase to an AAD 0.27 MGD and an ADMM of 0.41 MGD. Projected 2030 flows are projected to further increase to an AAD of 0.44 MGD and an ADMM of 0.66 MGD. Improvements and upgrades to the Wastewater Collection System and Treatment Plant are required to meet these projected future flows.

Future flow projections were estimated by combining the actual existing flow with future projections. The future flow projections were estimated using population data from the United States Census Bureau, existing and

future EDU information provided by NMWS, and review of literature for common design guidelines for municipal wastewater guidelines.[1,2]

Based on these guidelines, it is estimated that each EDU will contribute about 190 gallons per day (gpd) of additional flows. This combined with the number of County parcels and projected future connections, translates into 0.44 MGD AAD of Near-Term (2030) flow, as well as 1.1 MGD AAD of Build-Out (2050) flow.

These projections require improvements at the treatment plant to accommodate future conditions, including but not limited to:

- Install a new Influent Pump Station at the WWTP facility
- Upgrade the influent screening facility
- Improve and expand the existing anoxic basins to remain compliant with regulations
- Improve and expand the aeration basin
- Expand the MBR basins and appurtenances
- Improve the disinfection and effluent pumping system
- Improve the sludge aerobic digester and solids handling facility
- Upgrade the plant's Electrical, Instrumentation and Controls (E&IC)

Equivalent Dwelling Units

Existing and projected EDUs are as follows:

Equivalent Dwelling Units						
Existing + Committed			Near-Term 2030 (NT)		Build-Out 2050 (BO)	
Existing (E)	Committed (C)	Total (E+C)	Incremental NT EDUs	Total (E+C+NT)	Incremental BO EDUs	Total (E+C+NT+BO)
1,455	240	1,695	577	2,272	3,438	5,710

Total Project Costs

The Capital Improvement Plan (CIP) outlines improvements required to meet future growth and hydraulic conditions within the RDO SS system. The CIP is categorized in one of three phases: Existing + Committed, Near-Term 2030, and Build-Out 2050.

Estimated Total Project Cost[3]						
Existing + Committed			Near-Term 2030 (NT)		Build-Out 2050 (BO)	
Existing (E)	Committed (C)	Total (E+C)	Incremental NT Cost	Total (E+C+NT)	Incremental BO Cost	Total (E+C+NT+BO)
$2.8M	$2.8M	$5.6M	$5.8M	$11.4M	$33.8M	$45.2M

[1] Ten States Standards, Lakes, Great, and Upper Mississippi River Board. "Recommended Standards for Wastewater Facilities." Health Education Services Division, Health Research Inc.: Menands, NY, USA (2004).
[2] Metcalf & Eddy, et al. Wastewater engineering: treatment and resource recovery. McGraw Hill Education, 2014.
[3] Total Project Cost = Opinion of Probable Construction Cost (OPCC, including 25% design contingency, 25% contractor overhead, and 10% construction contingency) + 20% for non-construction costs (design, permitting, and CM)

2. Introduction

Water Works Engineers, LLC (Water Works) is under contract with the New Mexico Water Service Company (New Mexico Water, or NMWS) to develop a Master Plan (MP) update for the Rio Del Oro (RDO) and Rio Communities Sanitary Sewer (SS) systems. NMWS owns and operates the RDO and Rio Communities SS systems within the Valencia County. The SS system was initially developed in 1985 to serve the University of New Mexico (UNM) Valencia Campus and neighboring residential and commercial developments. In 2002, NMWS procured the system from the Rio Grande Utilities Corporation (RGUC) and currently serves seven (7) developments and five (5) schools, including the UNM campus. This collection system involves a combination of 6 Lift Stations (LS) and gravity pipes and that bring the raw sewage to the RDO Wastewater Treatment Plant (WWTP), where it's treated before being discharged. An overview of the SS system service area is shown below.

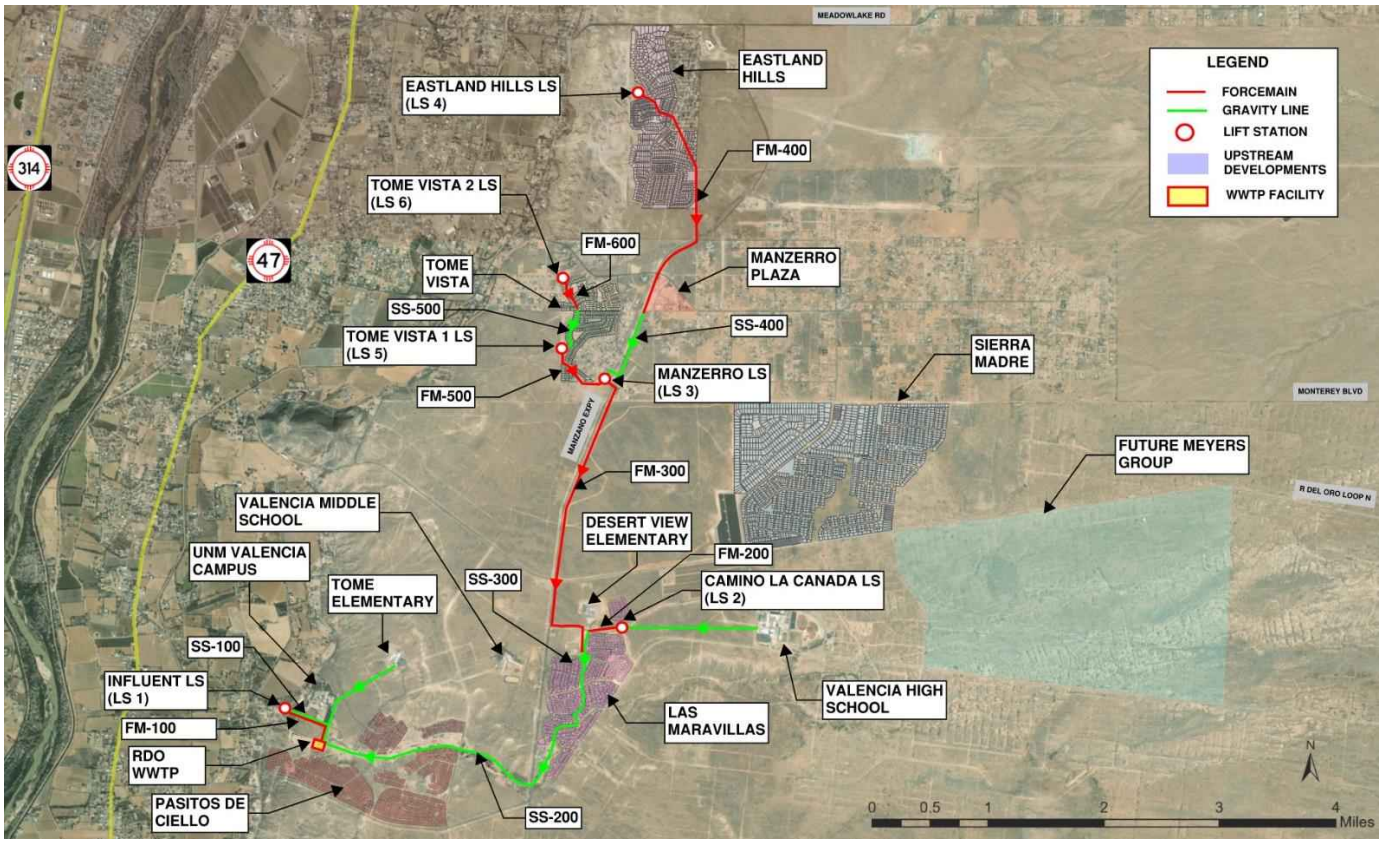


Figure 1 – Sanitary Sewer System Overview

The intent of this MP is to evaluate the existing collection and treatment system capacities and provide improvement recommendations to meet future needs. NMWS is currently experiencing an increase of developers within the service area who have either started development or are in the planning or design stages for future developments. These developments will impact the existing infrastructure capacity and will require improvements of both the collection system and the treatment plant. In this report, the existing collection and treatment systems are evaluated, and improvement recommendations are provided to meet existing system needs, Near-Term (NT) (2030) growth, as well as Build-Out (BO) (2050) growth conditions.

3. Background

3.1 Collection System

The collection system is comprised of both gravity Sanitary Sewer (SS) and pressure sewer Forcemains (FM) that collect raw sewage from residential and commercial developments in the north and convey the flows to the RDO WWTP in the south. The collection network consists of interceptors that generally run along the Manzano Expressway and a series of Lift Stations (LS) that assist in lifting the sewage from the low points in the service area. Criteria of the collection system is described in the following sections.

3.1.1 Gravity Sanitary Sewer

The majority of the gravity collection system exists in the southern portion of the service area, as shown in Figure 1. Piping materials for the gravity network consist primarily of Polyvinyl Chloride (PVC) and a small segment of High-Density Polyethylene (HDPE) piping ranging in size from 8 to 15-inches. Concrete manholes (MH) along the gravity alignments are installed in approximately 400-ft intervals for servicing of the sewer lines. Table below provides a summary of the RDO gravity SS collection system[1].

Table 1 – Existing SS Gravity

Designation	Description	Size [in]	Length [ft]	Material	Year Built
SS-100	Receives all flow from the collection system and discharges into the Influent LS (LS 1). Line begins within the fence line of the WWTP and extends to the LS, just east of La Entrada Road.	8	1,830	PVC	1989
SS-200	Collects and conveys majority of flows from the RDO system to the downstream RDO-100 interceptor. Main begins within the Habitat and Pasitos de Cielo areas, West of Manzano Expressway, and terminates within the fence line of the WWTP.	15	8,385	PVC	1989
SS-300	Collects flows from the Las Maravillas development and all upstream forcemains. Line begins in the Las Maravillas development and ends just east of the Manzano Expressway before entering the Habitat and Pasitos de Cielo areas.	15	6,304	PVC	1989
SS-400	Collects and directs flows from the Eastland Hills development to the downstream Manzerro LS. Main begins just south of the Manzerro Plaza along Manzano Expressway and extends to the Manzerro LS.	12	3,411	PVC/ HDPE	2004
SS-500	Collects flows from the Tome Vista 2 development area and discharges into the Tome Vista LS #1. Line begins within the Tome Vista development area and terminates at the LS accordingly.	-	1,667	PVC	2006[1]

1. Assumed based on age of lift station

In addition to gravity pipes shown, there is an approximately 6,000-ft long 8-in PVC line that brings flows from the Valencia High School to the Camino La Canada LS, from where it's pumped to the Las Maravillas gravity collection. Also, a section of the Eastland Hills development, located in the northeast of the development, is

[1] Rio Del Oro and Rio Communities Wastewater Master Plan, May 2007

currently serviced by septic sewer systems. These septic users do not currently contribute to the loadings on the sewer system and have been excluded from future wastewater projections and any potential improvement projects.

3.1.2 Lift Stations and Forcemains

New Mexico Water owns, operates, and maintains 6 Lift Stations within the RDO collection system. These stations are located at critical junctures within the service area, collecting flows from the individual development areas and lifting the sewage from low points within the system. A summary of the exiting LS and capacities within the RDO system is presented below.

Table 2 – Existing Lift Stations

LS ID	LS Name	Criteria	Year Built
LS 1	College LS	Duplex Flygt (Duty/Standby), 6" discharge, 20 HP, 1,000 gpm at 50 ft TDH	1987
LS 2	Camino De Canada LS	Duplex Flygt (Duty/Standby), 4" discharge, 5 HP, 400 gpm at 32 ft TDH	2001
LS 3	Manzerro LS	Duplex Flygt (Duty/Standby), 4" discharge, 30 HP, 500 gpm at 103 ft TDH	2004
LS 4	Eastland Hills LS	Duplex Flygt (Duty/Standby), 4" discharge, 30 HP, 930 gpm at 113 ft TDH	2004
LS 5	Tome Vista #1 LS	Duplex Flygt (Duty/Standby), 4" discharge, 10 HP, 500 gpm at 50 ft TDH, Variable Frequency Drives (VFD) operation	2006
LS 6	Tome Vista #2 LS	Duplex Flygt (Duty/Standby), 3" discharge, 4 HP, 180 gpm at 40 ft TDH	2021

The majority of the forcemains are constructed of PVC material and ranges in size from 6 to 8-inches. Cleanouts located along the alignment allow for routine maintenance to be completed for these pressurized segments of the collection system. Table below provides a summary of the existing RDO forcemain collection system[1].

Table 3 – Existing Forcemains

Line Designation	Location/Description	Size [in]	Length [ft]	Material	Year Built
FM-100	Known as the La Entrada forcemain, this line serves as the inlet to the WWTP. The main begins at the Influent LS (College LS or LS 1) and terminates at the headworks of the WWTP.	6	2,500	PVC	1987
FM-200	Known as the La Camino de la Canada forcemain, this line collects raw sewage from Valencia High School and dumps it into the 15" gravity interceptor that begins upstream the Las Maravillas development area.	6	1,320	PVC	1989
FM-300	Known as the Manzerro forcemain, this segment transports the flow from the Manzerro LS and discharges it into the 15"	8	11,882	PVC	2004

[1] Rio Del Oro and Rio Communities Wastewater Master Plan, May 2007

	gravity interceptor that begins within the Las Maravillas development area.				
FM-400	Known as the Eastland Hills forcemain, this section gathers the flow from the Eastland Hills LS and directs it to a gravity manhole just north of the Manzerro LS.	6 8	6,658 4,200	PVC	2004
FM-500	Known as the Tome Vista 1 forcemain, this line runs from Tome Vista LS #1 within the Tome Vista development area and sends the raw sewage to the Manzerro LS.	-	2,716	PVC	2006[1]
FM-600	Known as the Tome Vista 2 forcemain, this line runs from the Tome Vista LS #2 and discharges into a gravity manhole within the Tome Vista development just upstream of Tome Vista LS #1.	-	1,299	PVC	2006[1]

1. Assumed based on age of lift station

3.2 Wastewater Treatment Plant

The Rio Del Oro Wastewater Treatment Plant has an Annual Average Day (AAD) flow of 0.20 MGD and Average Day Maximum Month (ADMM) capacity of 0.30 MGD, which is equal to the existing MBR capacity for peak conditions. This plant was upgraded in 2004 from a conventional activated sludge plant, to take advantage of the smaller footprint and greater quality effluent that could be produced by an MBR. Since the reconfiguration of the plant in 2004 and few upgrades in 2014, including replacement of the MBR cassettes and blowers, this facility has seen no significant upgrades. The plant continues to operate within its NPDES permitted flow capacity since. An overview of the RDO WWTP facility is shown below.

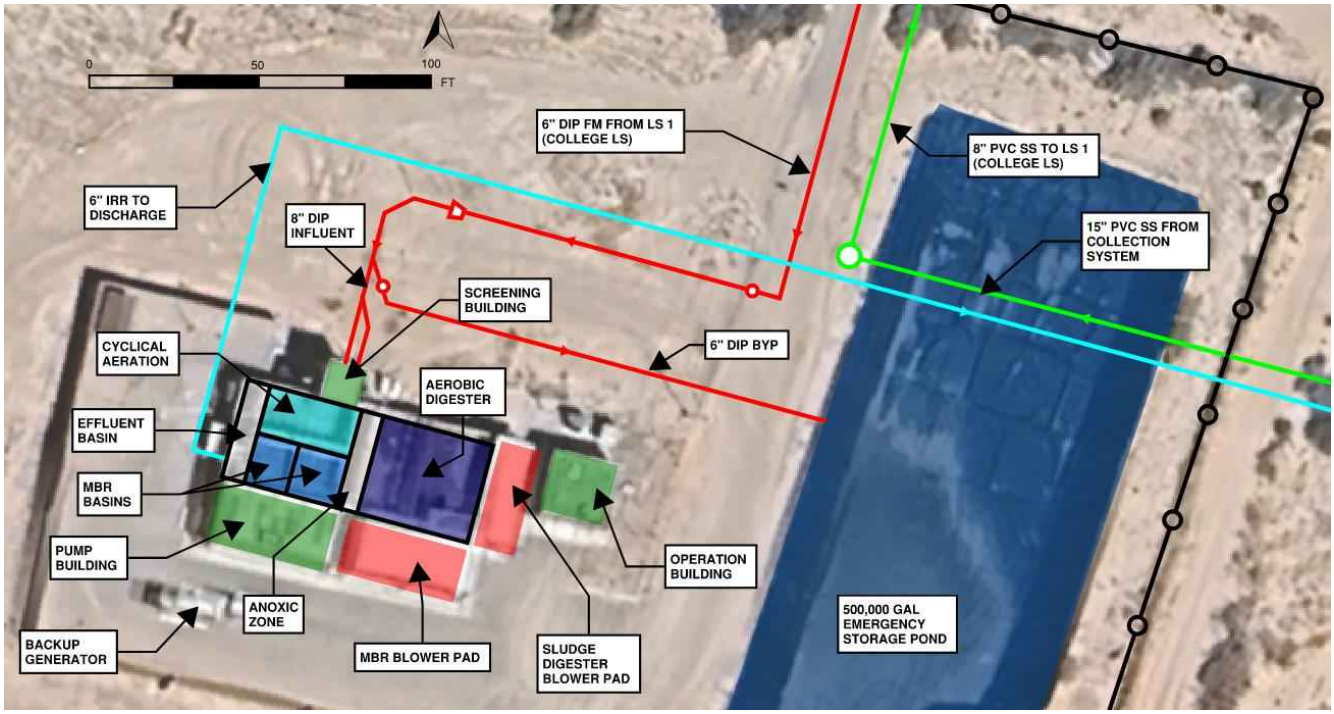


Figure 2 – RDO WWTP Site Overview

Raw sewage enters the plant from the north through a 6-inch Ductile Iron Pipe (DIP) forcemain coming for the influent LS (College LS). Upon entering the plant, the line splits into two parallel 8" DIP influent pipes before

entering the elevated screening facility. Two 3-mm bar screens (duty/standby) capture and remove solid material prior to sending the screened flow to the secondary treatment process. The biological treatment process begins with the screened, raw wastewater and Return Activated Sludge (RAS) flow from the MBR Basin flows entering what is known as the Cyclical Aeration basin (also known as pre-aeration basin). The combined Mixed Liquor Suspended Solids (MLSS) solution undergoes biological treatment via the SymBio process, a simultaneous Nitrification/Denitrification method trademarked by Enviroquip, Incorporated. This technique allows for the removal of nitrogen from the system within one basin through the manipulation of Dissolved Oxygen (DO) on a timed interval. Following the SymBio process, MLSS is pumped from the Cyclical Aeration Basin to one of the downstream MBR Basins for liquid-solid separation. In the membrane zone, permeate pumps draw the treated effluent through the membranes while blowers provide a constant supply of air for scouring and prevention of fouling of the membrane. The treated effluent is then conveyed to one of two (duty/standby) inline UV systems for disinfection of the effluent. Following disinfection, the treated effluent is directed to the effluent basin (current anoxic basin) for intermediate storage before it is pumped via an effluent vertical turbine pump to the permitted reuse sites.

Sludge generated from the treatment process concentrates within the MBR basin as the permeate is removed from the system. Return Activated Sludge (RAS) is sent back to the Cyclical Aeration basin using one of two (one for each basin) telescoping valves to assist in seeding of the incoming raw sewage. Simultaneously, Waste Activated Sludge (WAS) is removed from the MBR basins via one of two (one for each basin) Waste Activated Sludge (WAS) pumps and is sent to the Aerobic Digester for further treatment. Waste Activated Sludge (WAS) is ultimately disposed of at the permitted surface disposal site by a licensed sewage hauling servicer. See Appendix C for the existing Process Flow Diagram (PFD). Criteria of the existing WWTP components are summarized in the table below.

Table 4 – Existing WWTP Criteria

Item	Criteria	Year Built/Improved
Influent Screening	Tank Mounted Bar Screens - Two (1 duty/1 standby) W/ 3mm bar spacing (1/8” spacing)	2004/2008
	Screening Capacity - 278 gpm (0.4 MGD) per screen	
	Electrical/Motor Requirements - 0.5 HP, 480V, 3 Ph, 60 Hz	
	Controls - Local HOA, floats	
Biological Treatment	**Anoxic Basin**	
	11,800-gallon (4' W x 28' L x 18' D) two basins - one basin non-operational and other basin currently is used as an effluent clearwell	2004
	Mixers – None	
	MLSS Transfer Pump – None	
	Pre-Aeration (Cyclical Aeration) Basin	
	40,800-gallon (28' W x 13' L x 18' D) basin	2004/2014
	DO Range - 0.7-1 mg/L	
	Aeration Blowers - Two (1 duty/1 standby) 400 SCFM Aerzen blowers, 25 HP	
	Internal Recycle Pumps – None	
	MLSS Transfer Pumps (transfer to downstream MBR tanks) - Two (one per MBR), 139 gpm	

	One 2 HP Submersible Mixer	
	MBR Basin	
	Two 20,500-gallon (13.5' W x 14' L x 18' D) basins	2004/2014
	Submerged MBR units – four RM 200 units per tank (Total of 8), 38,000 gpd/unit or 304,000 gpd total treatment capacity with all units in service.	
	Aeration and Membrane Air Scour Blowers - Two (1 duty/1 standby) 1,125 SCFM Aerzen blowers, 60 HP	
	Permeate Pumps -Three (2 duty/1 standby) 125 gpm (0.2 MGD) per pump, 5 HP	
	WAS Pumps - Two (2 duty) 160 gpm (0.25 MGD) per pump, 1 HP	
	RAS Recycle - Two telescoping valves (one for each MBR tank), 833 gpm	
	Controls - existing control panel	
Disinfection System	Two 278 gpm (0.4 MGD) inline UV system, total 0.8 MGD capacity	2004/2014
Effluent Pump Station (EPS)	Vertical Turbine Pumping System	2004
	One 500 gpm at 150 ft TDH vertical turbine pump	
	11,800-gallon rectangular concrete tank (proposed anoxic)	
	Electrical/Motor Requirements - 50 HP, 460V, 3Ph, 60Hz	
	Discharge Forcemain - 6" Diameter	
	Controls - Local HOA, floats	
Solids Handling	One 94,000-gallon (32'L x 28'W x 17'D) aeration digester, with 3 ft of freeboard	2004/2014
	28 coarse TransMax air diffusers, average 2024 TN of 700 mg/L	
	Aeration Blowers - Two (1 duty/1 standby) 400 SCFM Aerzen blowers, 25 HP	
Electrical and Instrumentation	Service connection: 800 Amp, 600V, 60 Hz, 3 PHASE	2004
	Standby generator size: 350 KW	
	Local PLC and Supervisory Control and Data Acquisition (SCADA)	

Below is a timeline of the existing plant history:

- 1985 – original activated sludge plant construction
- 2004/2005 – conversion of the activated sludge plant to an MBR facility
- 2014 – replacement of the MBR cassettes, pre-aeration diffusers, and all blowers

As shown, the majority of the plant components have not been updated since 2004/2005 improvements, including but not limited to the primary treatment components, process pumps, and the disinfection system. Given that these components are nearly twenty (20) years old, they are close to their end of useful life. In 2014, the plant was improved with new fine bubble tube diffusers, MBR cassettes, and new pre-air, MBR, and digester blowers. It should be noted that the typical lifespan of the MBR cassettes is 5-10 years. However, this can be extended depending on factors like operating conditions, water quality, and cleaning frequencies.

3.3 Recycled Water

Treated and disinfected effluent from the RDO WWTP is used to provide supplemental non-potable water for spray irrigation of 116 acres within Veterans Park. The recycled water line is a 6-inch, approximately 4000-ft long PVC pipe that runs from the effluent basin clearwell to the dedicated reuse area just east of the RDO WWTP. Additionally, the discharge permit allows for the transfer of reclaimed water to the Valley Improvement Association for reuse applications associated with a separate discharge permit. In the event of an emergency or

routine maintenance, the permit also allows for the impoundment of reclaimed water within the existing 500,000-gallon storage lagoon located on the RDO WWTP site.

3.4 Compliance

The RDO WWTP holds the following National Pollutant Discharge Elimination System (NPDES) and Discharge Permits (DP):

- **NPDES NM0030414** from Region 6 of the United States Environmental Protection Agency (USEPA)
- **DP-356 Class 1A Reuse** from the New Mexico Environment Department (NMED)
- **DP-529 Sludge Disposal** from NMED for surface disposal

The following tables summarize these permits and their individual requirements.

Table 5 – NPDES NM0030414

Effluent Characteristics	Discharge Limitations (Expiration Date – 01/31/2026)					Monitoring Requirements	
	lb./day		mg/L (unless notes)			Measuring Frequency	Sample Type
Parameter	30-Day Avg.	7-Day Avg.	30-Day Avg.	7-Day Avg.	Daily Max		
Flow	N/A	N/A	0.3 MGD	0.3 MGD	0.3 MGD	Continuous	Totalizer
BOD_5	75	113	30	45	-	2/Month	Grab
TSS	75	113	30	45	-	2/Month	Grab
% Removal (min.) BOD_5	85%	-	-	-	-	1/Month	Calculation
% Removal (min.) TSS	85%	-	-	-	-	1/Month	Calculation
E. coli Bacteria	1.43 X 10^9 cfu/day	-	126	126	126	2/Month	Grab
Total Residual Chlorine	-	-	-	-	11 µg/L	5/Week	Instant Grab

Table 6 – DP-356 Class 1A Reuse

Effluent Characteristics	Class 1A Reclaimed (Expiration Date – 08/16/2026)	
Parameter	30-Day Avg.	Maximum.
E. coli Bacteria	3 CFU or MPN/100 mL	15 CFU or MPN/100 mL
BOD_5	10 mg/L	15 mg/L
Turbidity	3 NTU	5 NTU
UV Transmissivity	Monitor Only	Monitor Only
Total Nitrogen	10 mg/L[1]	

1. Quarterly reported

Table 7 – DP-529 Sludge Disposal

Item	Criteria
Sludge Class	Class B Surface Disposal (Expiration 05/16/2028)
Flow	4,000 gpd (Annual Avg.), 14,000 gpd (Daily Max.)
Total Nitrogen	< 200 lb./acre/year
Depth to Groundwater	185 feet
Total Dissolved Solids	290 mg/L
Disposal Area	30.73 Acres/12 Cells

4 Planning

4.1 Existing Service Area

The existing collection system service area, involving seven developments and five schools, is bordered by the Rio Grande River to the west and the Manzano Mountain cluster to the east. The existing sanitary sewer system is primarily concentrated along the Manzano Expressway, where most of the existing developments exist. The following is a list of developments and schools connected to the RDO SS System.

- Eastland Hills
- Future Meyers Group
- Tome Vista - Manzano Vista
- Sierra Madre
- Las Maravillas
- Pasitos de Ciello/Habitat
- Manzerro Plaza
- Tome Elementary School
- Valencia Middle School
- Desert View Elementary School
- Valencia High School
- UNM Valencia Campus

The RDO WWTP effluent data provided by NMWS[1] from January 2022 to December 2023 is presented in Figure 3. Here, blue lines represent daily flows, while the solid black lines representing the 30-day average values. As shown, there has been an increase of flow in the past 24 months (average of 0.15% increase annually), which is expected to be due to the increased number of connections. According to these effluent flow values, and average WAS flow reported (approximately 2,000 gpd) the system is currently operating at about 0.19 MGD Annual Average Daily (AAD) flow, Peak Daily Flow (PDF) of 0.22 MGD, and 92nd percentile of 0.20 MGD, which is typically used as an estimate of Average Day Maximum Month (ADMM) value. Given that these are effluent data, they cannot be used to estimate the hourly peaking conditions, due to the flow being equalized throughout the facility. However, they suggest a daily peaking factor of 1.22 and monthly peaking factor of 1.06.

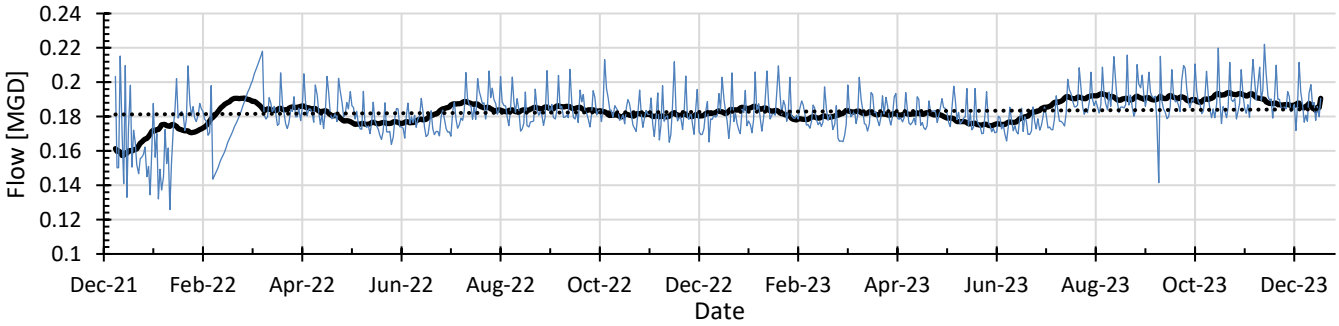


Figure 3 – 30-Day Average Effluent Flow Data (2022-2023)

Prior to projecting future flows, the existing wastewater generation rate should be estimated. Based on the number of active Equivalent Development Unit (EDU) connections and current number of students, it was estimated that the existing generation rate is about 100 gpd per EDU, as well as 10 gpd per student. Assuming

[1] RDO_Flow_2022-2023

the reported 2.5 population density in the Valencia County by the United States Census Bureau (USCB), it is estimated that the wastewater generation in this system is about 40 gpd per capita. These values are relatively small compared to the industry standards of 70-100 gpd/capita and 15 gpd per student, recommended by the Ten States Standard (Ten States)[1]. However, using 100 gpd per EDU and 10 gpd per student, the total estimated flow received at the WWTP comes to about 0.20 MGD, which similar to the value suggested by the effluent data. An estimate of these existing flow contributions is presented below.

Table 8 – Estimated Existing Flow Contributions

Item	Development	Existing (2024)	
		# of EDUs	Avg Q [gpd][1]
Residential Developments (# of EDUs)	Eastland Hills	218	21,800
	Future Meyers Group	-	-
	Tome Vista - Manzano Vista	359	35,900
	Sierra Madre	-	-
	Las Maravillas	627	62,700
	Pasitos de Ciello/Habitat	251	25,100
	Manzerro Plaza Residential	-	-
Schools (# of students)	Tome Elementary	106	1,060
	Valencia Middle School	492	4,920
	Desert View Elementary	445	4,450
	Valencia High School	2,484	24,840
	UNM Valencia	1,883	18,830
Commercial	Manzerro Plaza	1	500
	Other Commercial		-
Total			200,100

1. Using 100 gpd per EDU and 10 gpd per student assumptions

4.2 Flow Projections

Future flow projections were estimated by combining the actual existing flow with the higher rate future projections discussed. This method was chosen to provide more conservative values than using existing rates, without overestimating the growth. The Future flow contributions were estimated using population data from the USCB, existing and future EDU information provided by NMWS, and review of literature for common design guidelines for municipal wastewater guidelines, including the Ten States and Metcalf and Eddy[2]. The data from these various sources are shown below and provide the basis to calculate the future flow conditions.

Table 9 – Future Flow Projection Criteria

Item	Criteria	Source	Notes
Population increase rate	0.0028	State of NM	To estimate future student numbers

[1] Lakes, Great, and Upper Mississippi River Board. "Recommended Standards for Wastewater Facilities." Health Education Services Division, Health Research Inc.: Menands, NY, USA (2004).
[2] Metcalf & Eddy, et al. Wastewater engineering: treatment and resource recovery. McGraw Hill Education, 2014.

School generation rate	15 gpd per student	Ten States	To estimate school flows
Single family dwellings	190 gpd per EDU	Ten States	75 gpd per capita x 2.5 density = ~190 gpd/EDU
Retail	0.05 gpd per sf	Ten States	To estimate commercial flows
Laundromat	3.68 gpd per sf	Ten States	To estimate commercial flows
Supermarket	0.20 gpd per sf	Ten States	To estimate commercial flows
Drug Store	0.13 gpd per sf	Ten States	To estimate commercial flows
Beauty Salon/Barber	0.35 gpd per sf	Ten States	To estimate commercial flows
Car Wash	4.90 gpd per sf	Ten States	To estimate commercial flows
Hotel/Motel	0.25 gpd per sf	Ten States	To estimate commercial flows
Medical Office Building	0.62 gpd per sf	Ten States	To estimate commercial flows
Restaurants	25 gpd per person	Ten States	To estimate commercial flows

Using these values, future flow projections were developed for the following scenarios:

- **Existing + Committed** – these values represent existing flows, plus approved connections that have not been built yet. This will help identify and prioritize immediate needs within the system.
- **Near-Term 2030** – these values represent upcoming 2030 connections estimated in the next 5-6 years.
- **Build-Out 2050** – these values represent 2050 conditions, using available parcel numbers and data provided by NMWS for the next 25-26 years.

Results of these scenarios are presented below.

Table 10 – Future Flow Projections

Item	Development	2024 Existing + Committed		2030 Near Term (NT)		2050 Buildout (BO)	
		# of EDUs	Avg Q [gpd]	# of EDUs	Avg Q [gpd]	# of EDUs	Avg Q [gpd]
Residential Developments (# of EDUs)[1]	Eastland Hills	316	40,420	766	125,920	868	145,300
	Future Meyers Group	-	-	-	-	240	45,600
	Tome Vista - Manzano Vista	429	49,200	504	63,450	512	64,970
	Sierra Madre	-	-	-	-	2,505	475,950
	Las Maravillas	647	66,500	699	76,380	751	86,260
	Pasitos de Ciello/Habitat	251	25,100	251	25,100	782	125,990
	Manzerro Plaza Residential	52	9,880	52	9,880	52	9,880
Schools (# of students)[2]	Tome Elementary	106	1,590	108	1,617	114	1,710
	Valencia Middle School	492	7,380	500	7,505	529	7,936
	Desert View Elementary	445	6,675	453	6,788	479	7,178
	Valencia High School	2,484	37,260	2,526	37,890	2,671	40,067
	UNM Valencia	1,883	28,245	1,915	28,722	2,025	30,373
Commercial	Manzerro Plaza[3]	1	500	5	1,259	10	2,517
	Other Commercial[4]		-	-	55,463	-	80,916
Total			272,750		439,973		1,124,648

1. NT and BO flow projections are based on 190 gpd/EDU to match design guideline recommendations.
2. NT and BO student projections are based on Valencia County USCB growth rate of 0.28% and 15 gpd per student.
3. 5% and 10% retail space for NT and BO respectively
4. NT includes a laundromat (15,000 sf) and a beauty salon (750 sf). BO includes addition of a supermarket (16,800 sf), drug store (8,700 sf), carwash (2,600 sf), hotel/motel (14,300 sf), medical facility (5,000 sf), and a restaurant (50 person).

Based on the data presented above, the NT and BO improvements will be based on a projected Annual Average Daily (AAD) of 0.44 and 1.1 MGD respectively. Here is a summary of peaking factors based on effluent data, Ten States, typical industry standards, and those chosen as part of this master plan.

Table 11 – Peaking Flow Factors

Peaking Factor (PF)	Eff Data	Ten States	Typical Industry	Used	Description
Maximum Monthly (also known as ADMM)	1.1	1.6	1.2-1.4	1.5	Typically, 50% of Hourly PF. For sizing of bioreactors, chemical storage, and denitrification
Maximum or Peak Daily	1.3	2.4	1.8-2.0	2.3	Typically, 75% of Hourly PF, i.e., 0.75 x 3. For sizing of equalization tanks, sludge pumping, and chemical feed.
Peak Hourly	2.2	3.1	3-4	3.0	Sizing of pumps, physical treatment units, and disinfection system

Future flow projections, along with the PF listed above, are used to summarize the hydraulic conditions listed below.

Table 12 – Peaking Flow Factors

Peaking Factor	Existing	Existing + Committed	Near-Term	Build-Out	Description
Annual Average Day Flow (AAD)	0.20	0.27	0.44	1.10	MGD
Average Day Maximum Month (ADMM)	0.30	0.41	0.66	1.65	MGD
Peak Daily Flow (PDF)	0.45	0.61	1.00	2.50	MGD
Peak Hourly Flow (PHF)	0.60	0.81	1.32	3.30	MGD

4.3 Load Projections

The RDO Wastewater Treatment Facility has provided the NPDES discharge monitoring report worksheets from January 2023 to December 2023, which is presented in the table below.

Table 13 – 2023 NPDES Water Quality Report Data

Month	Influent		Effluent			
	30-Day Avg BOD5 [mg/L]	30-Day Avg TSS [mg/L]	30-Day Avg BOD5 [mg/L]	30-Day Avg TSS [mg/L]	pH [Daily Max]	30-Day Avg E. Coli [#/100 mL]
January	257.4	302.4	10.2	4.0	7.49	11.4
February	310.3	280.2	3.55	4.0	7.5	2.7
March	308.9	451.6	4.20	4.0	7.52	1
April	254.8	417.7	2.35	4.0	7.51	17.4
May	240.2	283.5	2.66	5.0	7.58	1
June	265.4	208.3	6.27	4.0	7.69	8.9
July	190.0	196.0	3.70	4.5	7.66	186.9
August	255.2	243.4	18.26	17.0	7.80	1773.1
September	252.1	169.7	12.65	15.5	7.90	51.1
October	168.0	267.3	3.89	4.0	7.66	14.4
November	277.4	219.7	4.88	4.0	7.55	2.7
December	318.0	191.7	5.69	5.5	7.71	2.3
Average	**258.1**	**269.3**	**6.5**	**6.3**	**7.6**	**172.7**
92nd %	**311.2**	**421.8**	**13.3**	**15.7**	**7.8**	**377.2**
Max	**318.0**	**451.6**	**18.3**	**17**	**7.9**	**1773.1**

These results were used, along with the projected flows, to model future conditions.

5 Model Developments

5.1 Collection System Modeling

InfoWorks ICM (Integrated Catchment Modeling) is an advanced software solution specifically crafted for the comprehensive modeling and management of water infrastructure systems. It offers a set of tools and modules meticulously designed to handle hydraulic modeling and wastewater management tasks. The ICM model was developed using the existing collection system gravity mains (larger than 8”), manholes, and lift stations. Once completed, the following model scenarios were developed, results of which are discussed in the following sections.

- **Existing 2024** – modeling of SS-100, SS-200, SS-300 gravity interceptor to evaluate conditions of the existing pipeline under existing PHF condition of 0.6 MGD
- **Existing 2024 + Committed** – modeling of SS-100, SS-200, SS-300 gravity interceptor to evaluate conditions of the existing pipeline under existing + committed PHF condition of 0.8 MGD
- **NT 2030** – modeling of the SS-100, SS-200, SS-300 gravity interceptors to evaluate conditions of the existing pipeline under AAD, PDF, PHF, and ADMM conditions
- **BO 2050** – modeling of entire collection system (except TV1 and TV2, due to absence of background) and lift stations under AAD, PDF, PHF, and ADMM conditions

Given absence of some record information, the following assumptions were used to develop these scenarios. Results of the InfoWorks ICM modeling are shown in Appendix B.

Table 14 – InfoWorks ICM Model Assumptions

Facility	Item	Criteria
Manzerro LS	Wet well depth	15 ft
	Wet well diameter	6 ft
	ON/OFF setpoints	3 ft below rim/ 3 ft above floor
	Forcemain depth to invert	5 ft from EG
	TV1/TV2	Direct flow into Manzerro LS
Eastland Hills LS	Wet well depth	10 ft
	Wet well diameter	6 ft
	ON/OFF setpoints	3 ft below rim/ 3 ft above floor
	Forcemain depth to invert	5 ft from EG
12” Gravity from Eastland Hills to Manzerro LS	Slope	Min 0.002
	Forcemain depth to invert	5 ft from EG
	Max velocity	10 fps
	Manhole spacing	400 ft
Valencia Middle School	Discharge location	15” PVC gravity in Las Maravillas
Gravity Pipelines	Manning’s “n” coefficient	0.013 (all pipes)
Forcemains	Hazen Williams coefficient	140 (all forcemains)

5.2 Wastewater Treatment Plant Modeling

BioWin, a software developed by EnviroSim, is a simulator that combines biological, chemical, and physical processes into one mass balance model. This software is used to provide insight into the design, upgrade, and

optimization of all types of wastewater treatment plants. This simulator was used along with operating data from the RDO WWTP to develop a strategic approach to the upgrading of the existing WWTP facilities.

The BioWin model was fed information regarding the plant layout, operating data, and loading criteria for the existing and committed, NT, and BO conditions respectively. An example of monthly parameters exported from the operators' handbook, including temperature, DO levels, and Transmembrane Pressure (TMP), is presented in table below. These values are used to calibrate the BioWin model results, including water temperature, DO setpoints, water level and freeboard, and blower air flows. The following is a list of model scenarios developed under this study.

- **Existing 2024** – this scenario was developed using existing conditions and loads. Once completed, the model was calibrated to generally represent the daily operational data presented in Table 15.
- **Existing 2024 + committed** – this scenario was developed to evaluate the treatment plant process operation with the additional committed connections.
- **NT 2030 –** this scenario was developed to evaluate the treatment plant process operation with the additional flow projected under the NT conditions.
- **BO 2050 –** similarly, this scenario was developed to evaluate the treatment plant process operation with the additional flow projected under the BO conditions.

Table 15 – WWTP Operational Data

Date	Temp	DO (Cyclical)	level	RAS 1	RAS 2	Cyclical Air	MBR Air	TMP 1	TMP2	Permeate	Permeate Turbidity
	[C]	[mg/L]	[ft]	[gpm]	[gpm]	[scfm]	[scfm]	psig	psig	[gpm]	[NTU]
1/17/2023	9.8	0.78	11.3	523	511	351	999	-0.9	-1.6	150	0.52
2/4/2023	8.5	0.78	12.8	605	525	353	1010	-2.8	0.80	109	0.22
3/17/2024	9.9	0.71	10	574	575	366	1042	0.7	0.2	150	0.91
4/14/2023	11.6	0.73	10.4	581	577	357	981	-0.1	-0.2	75	0.49
5/25/2023	15.1	0.72	11.5	380	368	343	918	0.8	0.2	150	1.84
6/12/2023	16.1	0.75	11.4	373	381	338	901	-0.4	-0.6	150	0.46
7/12/2023	18.6	0.71	10.7	365	399	345	909	-0.4	-0.2	150	0.27
8/10/2023	19.4	0.7	10.5	400	367	368	950	-0.6	-0.3	150	0.18
9/12/2023	19.2	0.75	12.4	419	389	356	960	-3.5	-3.6	240	0.80
10/10/2023	17.3	0.73	11.8	410	400	358	978	-0.4	-0.5	150	0.41
11/5/2023	14.8	0.76	9.6	347	387	364	897	0.6	0.3	75	0.05
12/15/2023	11.8	0.74	10.9	417	411	362	1055	-0.3	-0.6	150	0.29
Average	**14.3**	**0.7**	**11.1**	**450**	**441**	**355**	**967**	**-0.6**	**-0.5**	**142**	**0.54**
Max	**19.4**	**0.8**	**12.8**	**605**	**577**	**368**	**1055**	**0.8**	**0.8**	**240**	**1.84**
Min	**8.5**	**0.7**	**9.6**	**347**	**367**	**338**	**897**	**-3.5**	**-3.6**	**75**	**0.05**
92nd%	**19.2**	**0.8**	**12**	**584**	**575**	**366**	**1044**	**0.7**	**0.4**	**161**	**0.75**

Model parameters used for developing the BioWin model scenarios are summarized in the table below.

Table 16 – BioWin Modeling Parameters

Item	Criteria
Influent BOD	258 mg/L average, 311 mg/L ADMM (2023 data Table 13)
Volatile Suspended Solids	240 mg/L average, 338 mg/L ADMM (80% of TSS)
Total Suspended Solids	270 mg/L average, 422 mg/L ADMM (2023 data Table 13)
Influent N – TKN	52 mg/L average, 55 mg/L ADMM (based on September 2024 week sampling)

Influent P – Total P	6.5 (assumed)
Water Temperature	15°C (59 F)
Maximum Flux Rate	15 gpd/sf
MLSS	10,000-15,000 mg/L
Min Freeboard	3 ft
Aerobic Digester air	400 cfm, 40 min ON, 20 min OFF cycles

Using loading data listed earlier results in the following loading concentrations, when combined with various flow conditions. As shown below, combination of AAD concentrations and ADMM flows provide the most BOD and TKN loadings per day. This is with the exception of the TSS loading, which is nearly in the same ballpark for both combination and not as critical as other two in process modeling. Based on these values, the process model scenarios developed use the AAD concentrations combined with the ADMM flow values presented.

Table 17 – Loading Combinations

Loads [lbs./day]	Existing	Existing + Committed	Near-Term	Build-Out
TKN loading				
AAD Conc. x ADMM Flow	130	173	304	737
ADMM Conc. x AAD Flow	92	138	229	505
BOD Loading				
AAD Conc. x ADMM Flow	646	861	1506	3658
ADMM Conc. x AAD Flow	519	778	1297	2853
TSS Loading				
AAD Conc. x ADMM Flow	673	897	1570	3814
ADMM Conc. x AAD Flow	704	1056	1760	3871

6 Existing System Capacity

6.1 Gravity Sanitary Sewer

To evaluate capacity of the existing interceptor (SS-100, SS-200, and SS-300), which carries the majority of the flow to the influent LS, an ICM model scenario was developed using existing PHF conditions of 0.6 MGD. The Hydraulic Grade Line (HGL) resulted from this model is shown in Appendix B, Attachment 1. As shown, the downstream portion of the gravity interceptor is transitioning from a 15” PVC to an 8” PVC, just before entering the influent LS. This line is currently near capacity, i.e., 0.6 MGD existing PHF (Table 12), using ~0.8% slope and 70% d/D[1] industry standard threshold. Additional flows, e.g., committed connections, will cause surcharging into the 8” and back into the 15” PVC, with potential Sanitary Sewer Overflow (SSO) along the 8” section, see the 0.8 MGD PHF for existing + committed (Attachment 2). To accommodate future flows, the existing 8” section needs to be upsized. This can also be resolved by addition of a new influent pump station upstream of the existing 8”,

[1] depth of water (d) to internal Diameter of pipe (D), (d/D).

to divert majority of flow to the plant, and continue using the existing 8" PVC for the adjacent school flows. This improvement is further described in the following sections.

6.2 Forcemains and Lift Stations

A summary of the existing LS capacities, along with the future needs are shown in Table 18. As shown, most of the stations seem to have sufficient capacity to meet existing and future conditions, based on their upstream number of EDUs. However, potential improvements are likely needed for a few of the stations to meet such conditions, highlighted. These improvements are further discussed in the following sections. Note that the influent LS (college LS) is included as part of the WWTP components, this is due to its current function.

Table 18 – Lift Station Capacity Summaries

Item	Existing Capacity[1]		Existing		Existing + Committed		NT 2030		BO 2050	
	[gpm]	[MGD]	AAD [MGD]	PHF [MGD]	AAD [MGD]	PHF [MGD]	AAD [MGD]	PHF [MGD]	AAD [MGD]	PHF [MGD]
Camino De Canada LS	400	0.58	0.02	0.07	0.04	0.11	0.04	0.11	0.04	0.12
Manzerro LS	500	0.72	0.06	0.17	0.10	0.30	0.25	0.76	0.30	0.90
Eastland Hills LS	930	1.34	0.02	0.07	0.04	0.12	0.12	0.37	0.14	0.43
TV1 LS	500	0.72	0.04	0.11	0.05	0.15	0.06	0.19	0.06	0.19
TV2 LS	180	0.26	0.02	0.05	0.02	0.06	0.03	0.08	0.03	0.08

1. Based on BEP, current operating point may be different

Table below summarizes capacity of the existing system forcemains, based on the assumption of 9 feet per second (fps) maximum velocity. As shown, most of the forcemains are sized enough to handle 2050 PHF conditions above.

Table 19 – Forcemain Capacity Summaries

Item	Size [in]	ID[1]	Material	Capacity [gpm]	Capacity [MGD]
FM-100	6	5.86	PVC	757	1.1
FM-200	6	5.86	PVC	757	1.1
FM-300	8	7.68	PVC	1300	1.9
FM-400	6/8	5.86	PVC	757	1.1

1. Assumed C-900 DR 14 class pipe
2. No information was available for FM-500 and FM-600 during development of this report

6.3 Treatment System

6.3.1 Process Evaluations

Results of the calibrated BioWin model using existing ADMM flows and AAD loads at steady state are presented below. As shown, the Cyclical Aeration basin is operating at higher air flow conditions provided by the operators (Table 15), due to higher flow values during ADMM conditions. This combined by reducing the DO level in the aeration (<0.5 mg/L), allows the plant to meet effluent requirements, while maintaining MLSS concentration of about 14 g/L. In addition, according to the operator, the plant typically wastes approximately 14,000 gal of MLSS per week, i.e., ~2,000 gpd, which is generally about 10% of the AAD. WAS resulted in this model scenario is about 10-12% of the ADMM flow given the model.

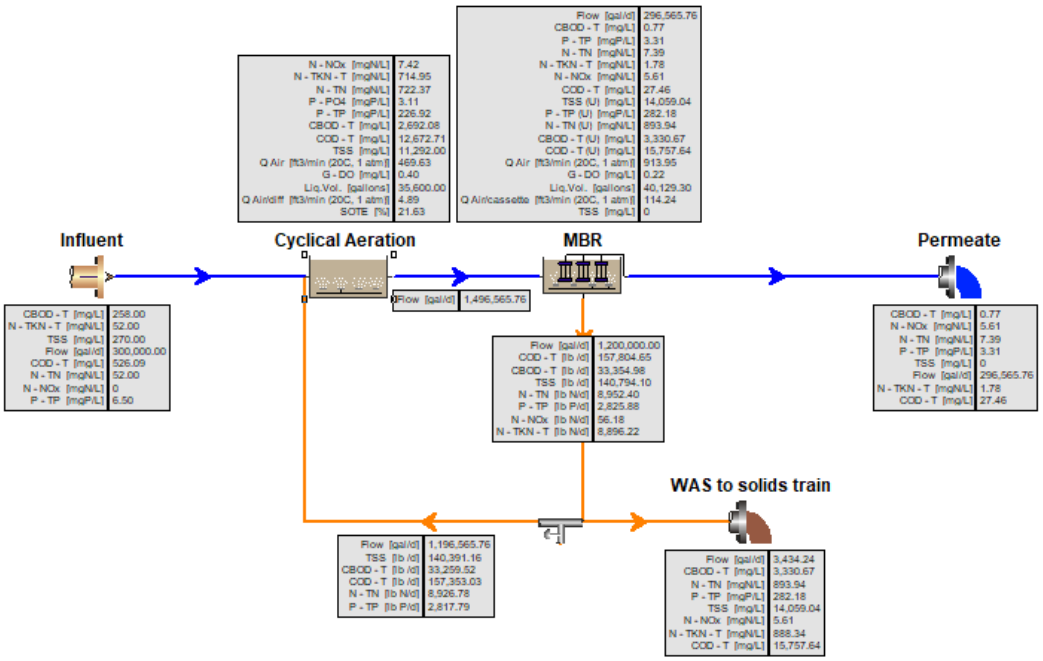


Figure 4 – Existing Process Model

Similarly, results of the future ADMM flows combined with AAD loads are presented in the following figures.

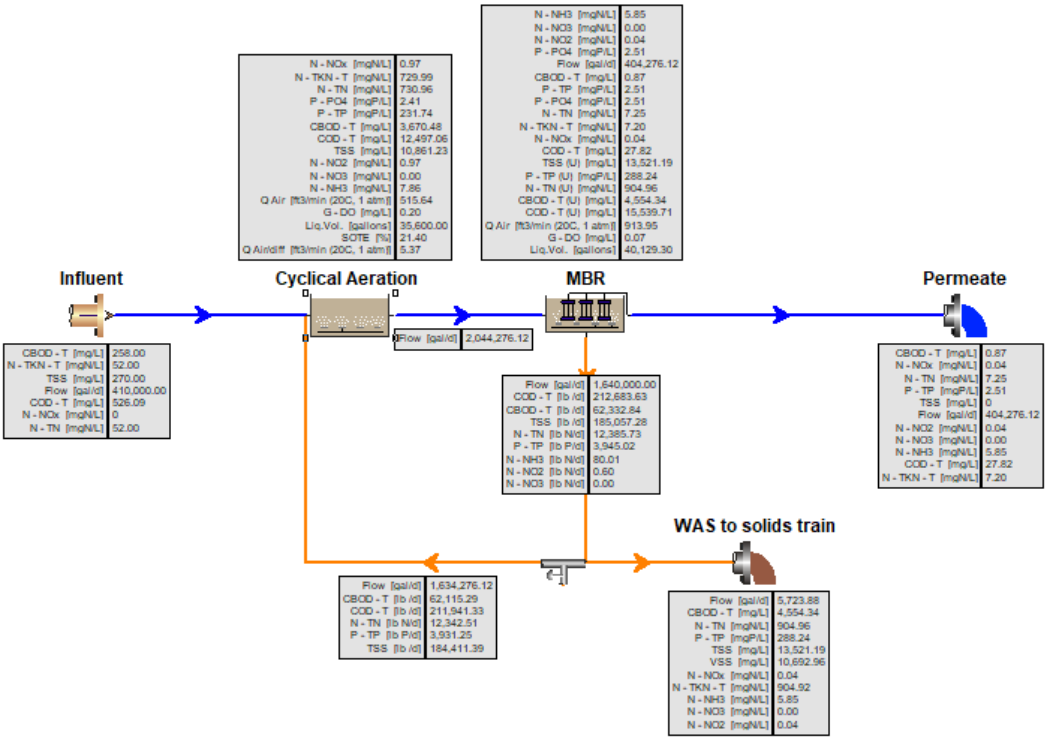


Figure 5 – Existing + Committed Process Model

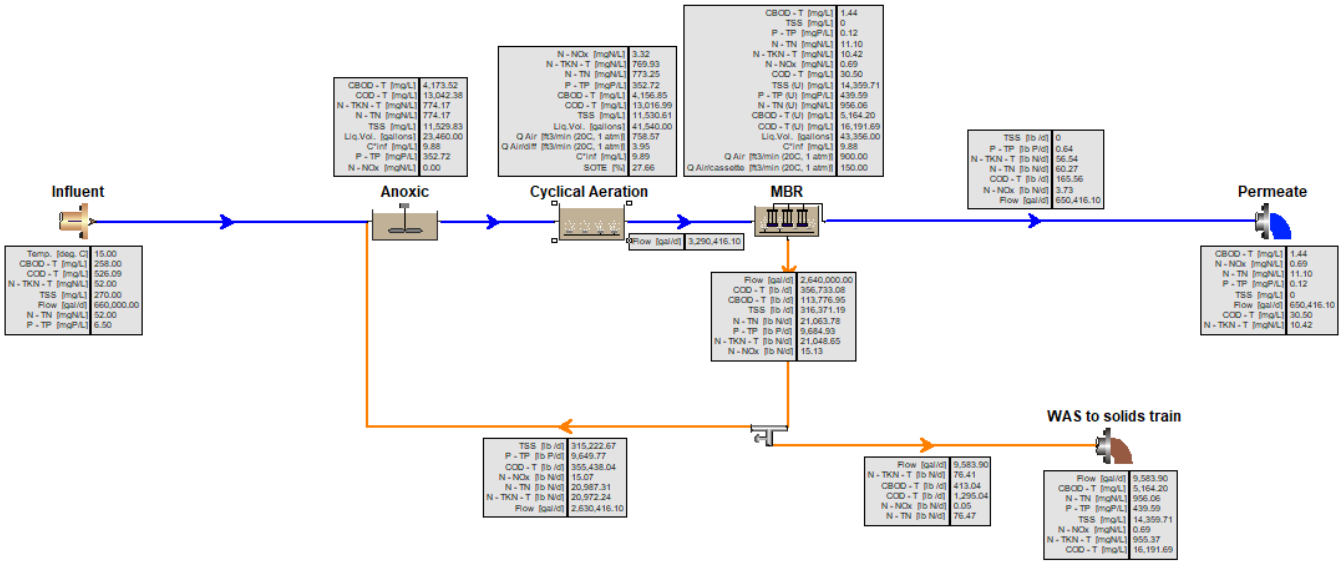


Figure 6 – Near Term 2030 Process Model

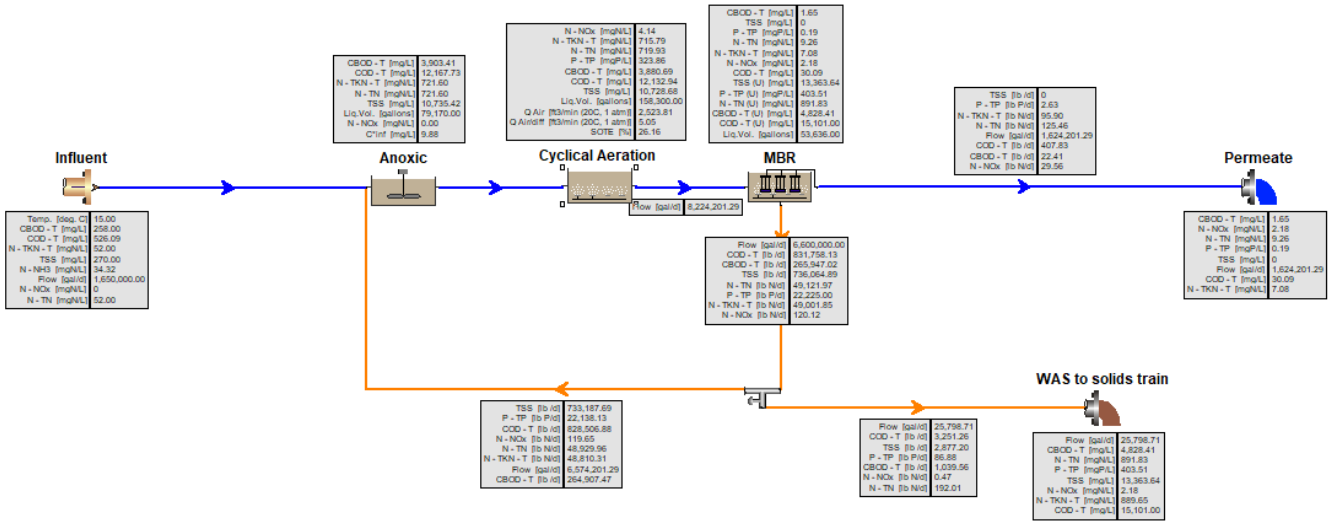


Figure 7 – Build Out 2050 Process Model

A summary of these results is presented below.

Table 20 – Summary of Existing and Future Process Model Results

Criteria	Existing	Existing + Committed	NT 2030	BO 2050
Effluent TN [mg/L]	7.39	7.25	11.1	9.26
Effluent NOx [mg/L]	5.61	0.04	0.69	2.18
Effluent Ammonia	0.28	5.85	8.92	5.62
Effluent TKN [mg/L]	1.78	7.2	10.42	7.08
Effluent BOD [mg/L]	0.77	0.87	1.44	1.65
Aeration basin DO [mg/L]	0.4	0.2	0.7	0.5

Aeration basin air [cfm]	470	515	760	2,524
RAS TSS [lbs./day]	157,350	184,400	315,222	733,188
MLSS [g/L]	14.1	13.5	14.4	13.3
WAS [gpd]	3,434	5,724	9,600	25,800
Solid Retention Time (SRT) [day]	20	12	8	7
Digested Sludge TN [mg/L]	850	630	790	820
Aerobic Digester air [cfm][2]	280	280	280	280

1. Same blower power for all scenarios

6.3.2 Hydraulic Capacity

Capacity of the various components of the WWTP, along with the expected capacity needed to meet future growth conditions are summarized in table below. As shown, several of the treatment components have sufficient capacity to handle existing conditions. However, some of these components appear to be near or at capacity to meet additional flows, including the influent lift station, MBR units, permeated pumps, and the effluent pump station. These limitations do not include age or conditions of the existing system and solely hydraulic related.

Table 21 – WWTP Component Hydraulic Capacity

Item	Criteria	Sizing Criteria	Current Capacity	Recommended Capacity			
				Existing	Existing + Committed	NT 2030	BO 2030
Influent Lift Station	2 pumps, 1000 gpm ea	PHF	0.7[1]	0.6	0.8	1.3[2]	3.3
Influent Screening	2 units @ 278 gpm ea	PHF	0.8	0.6	0.8	1.3	3.3
MBR Units	8 RM 200 units	ADMM	0.3	0.3	0.4	0.7	1.7
Permeate Pumps	3 pumps @ 150 gpm ea	ADMM	0.36[3]	0.3	0.4	0.7	1.7
WAS Pumps	2 pumps @ 160 gpm ea	PHF	0.5	0.01	0.02	0.03	0.1
Disinfection System	2 units @ 278 gpm ea	PHF	0.8	0.3	0.4	0.7	1.7
Effluent Pump Station	1 pump @ 500 gpm	PHF	0.7	0.6	0.8	1.3	3.3

1. Pump capacities shown are based on BEP, actual operating point seems about 500 gpm (0.7 MGD).
2. Rounded up to half BO conditions to allow for lead/lag operation
3. Pump capacities shown are based on BEP, actual operating point is about 0.18 MGD.

6.4 Existing System Needs

As discussed previously, the majority of the existing system components seem to be near or at capacity to meet exiting conditions. However, given the capacity limits and age of some these components, Water Works has summarized the following needs to ensure the system can keep up with the existing conditions, i.e., no additional flow added:

- **Influent LS** – the pump capacity listed in the pump submittal (1,000 gpm at 50 ft TDH) does not appear to be matching with the average suggested by the effluent flow data (500 gpm at 75 ft TDH). Although the capacity seems sufficient to handle existing conditions, given the age of the pumps and lack of flow metering device, it is our recommendation to at minimum evaluate and improve the existing pumps, controls, and add a magnetic influent flow meter (mag meter) to collect reliable influent flow data.
- **Anoxic Basins** – currently the plant can only perform denitrification by means of tweaking the pre-aeration or cyclical aeration basin. This has caused a significant operational burden with respect to reducing nitrogen levels, e.g., nitrite and nitrate. It is our recommendation to at minimum bring one of

the anoxic basins back to service and use to provide more operational flexibilities. This improvement would also require additional pumps, mixers, and piping.

- **Aeration Basin** – the existing diffusers are about 10 years old and at the end of their useful life. It is our recommendation to replace these diffusers as part of the existing plant improvements to avoid potential operational issues.
- **MBR Cassettes** – using typical flux value of 12 gpd/sf results in 0.3 MGD maximum permeate capacity, based on the existing RM 200 cassettes, with total surface area of 25,000 sf. Comparing these to the ADMM values in Table 12, the plant is currently near capacity with a small safety margin, using higher flux values. This means the existing system cannot accept additional flows without being expanded. In addition, given that existing MBR cassettes are about ten (10) years old and are on the later end of their life expectancy, they are due for replacement.
- **Process Pumps** – all process pumps including MLSS transfer, WAS, and permeate pumps are original to the 2004/2005 improvements and near end of their useful life. The permeate pumps are designed for maximum capacity of at 150 gpm (0.2 MGD) per pump, i.e., 0.4 MGD with two pumps, at Best Efficiency Point (BEP). However, these pumps, when turned on, are reported to put out an average of 125 gpm (0.18 MGD) per pump, i.e., 0.36 MGD total. This is currently smaller than the recommended range and could be due to the tight downstream piping and common mag meter. Given the age and limitations, it is recommended to replace these pumps and corresponding piping. In addition, the WAS pumps are near their 20-year life expectancy and are recommended to be replaced.
- **Effluent Pump Station (EPS)** – the existing EPS is currently about 20 years old and has no redundancy. To continue operation of the plant at existing capacity, it is important for this pump to be replaced or supplemented with a secondary redundant pump.

Costs associated with these existing improvements are shown in Appendix E.

7 Future System Improvements

In the following sections, future improvements recommended for the collection system, as well as the treatment system are discussed. These improvements are classified into three categories of 2024 existing + committed, NT (2030) improvements, and BO (2050) improvements, and are compared with the existing conditions. Additional information related to each improvement, including Opinion of Probable Construction Costs (OPCC), Process Flow Diagram (PFD), and Hydraulic Grade Lines (HGLs) can be found in corresponding appendices.

7.1 Collection System

7.1.1 Gravity Collection

As discussed earlier, the existing 8” PVC is currently near capacity and needs to be upsized to handle future flows. Alternatively, this can be resolved by installing the new influent pump station downstream of the existing 15” PVC portion, and only using the 8” PVC as a local collector line. See Appendix B, Attachment 1 for existing PHF HGL and Attachment 2 for HGL and 8” surcharging under 2024 + committed PHF. The following hydraulic results show that removing this downstream limitation will resolve surcharging during future scenarios.

As shown in Attachment 3 and 4, downstream limitation related to the 8” PVC can cause surcharging into the SS-200 portion during 2030 and 2050 PHF (3.0 MGD) conditions. These conditions were resolved when upsizing the

downstream 8" to 15" during 2050 PHF flow conditions, see Attachment 5, or by the new lift station. In addition, as shown in Attachments 4, the upstream portion of the 15" PVC (SS-300) along the Las Maravillas community is not sized enough to handle the entire system 2050 PHF flow of 3.0 MGD. Therefore, it is our recommendation to add a parallel gravity pipeline along the Manzano Exp to convey flow from Manzerro LS to the southern portion of the collection system, where flow merges with the Las Maravillas basin, see Attachment 5. Based on these results, using a minimum 15" pipe can resolve this surcharging during 2050 PHF conditions. Summary of the gravity system criteria is shown in table below. Note that SS-400 and SS-500 are not shown in this table, because at the time of developing this report background data required for modeling was not available. In addition, given that these two pipes are on the upstream of the collection system, they are anticipated to be not as critical as downstream interceptors.

Costs associated with these improvements are summarized in Appendix E.

Table 22 – Gravity Collection Improvement Criteria

Item	Existing 2024 + Committed[1]	NT 2030	BO 2050
SS-100 – 8" PVC	Upgrade College LS pumps and controls	Divert flow to new influent LS	
SS-200 – 15" PVC	No issue	No issue	No issue
SS-300 – 15" PVC	No issue	No issue	Install new 15" parallel pipeline, 1.2 mi

1. Common for existing and existing + committed

7.1.2 Forcemains and Lift Stations

As shown in previous section and hydraulic results (Attachment 3), the Manzerro LS is expected to be able to handle the majority of the 2050 PHF conditions. However, given that this LS only has two pumps (active/duty), about 20 years old, with capacity near 2050 PHF, it is our recommendation for this LS to be further evaluated and improved with a third pump, or potential upsizing of the pumps with VFDs to handle BO conditions. Majority of the forcemain pipes within the system seems to have sufficient size to handle future flow, except for the influent LS (college LS) forcemain that needs to be upsized to handle future flows. This is discussed in the following section.

Table 23 – Lift Station Improvement Criteria

Item	Existing 2024 + Committed	NT 2030	BO 2050
LS 1 – College LS	500 gpm at 50 ft TDH	See the following section for treatment improvements	
LS 2 - Camino De Canada LS	400 gpm at 32 ft TDH		
LS 3 – Manzerro LS	500 gpm at 103 ft TDH		650 gpm at 200 ft TDH
LS 4 - Eastland Hills LS	930 gpm at 113 ft TDH		
LS 5 - Tome Vista #1	500 gpm at 50 ft TDH, VFD		
LS 6 - Tome Vista #2	180 gpm at 40 ft TDH		

1. Common for existing and existing + committed

7.2 Treatment System Improvements

The recommended improvements for each treatment component to increase the plant capacity to meet, committed, NT, and BO conditions are described in the following sections. See Appendices C, D, and E for corresponding PFD, and OPCC.

7.2.1 Influent Pump Station

According to the effluent data and IPS hourly log, the existing pumps seem to be operating at about 500 gpm (0.7 MGD) at 75 TDH, and on a duty/standby configuration. This is enough to meet existing conditions. However, these pumps are undersized to meet future conditions. The existing 6" forcemain will also experience high velocities, e.g., 10-11 feet per second (fps) during NT PHF, which is higher than the recommended maximum velocity of 9 fps for pressure pipelines. To meet expected NT conditions, it is our recommendation to install a new influent LS adjacent to the plant, upstream of the 8" PVC, and repurpose the College LS to its original purpose of serving the college and elementary school. The new IPS will be fed via a new 18" PVC gravity line from manhole (MH) 7A. The existing 8" PVC gravity line from MH 7A to MH 5 will be repurposed to collect local sewage from the schools. The existing 6" forcemain from the College LS will be intercepted within the fence line of the WWTP and redirected to the new IPS. A dual forcemain will be constructed from the IPS to a connection point just upstream of the screen inlet. The new IPS will include VFD controls and mag meter for robust flow monitoring and controls.

In addition, it is our recommendation to include a manual coarse screen (0.5") or potentially a mechanical auger screen at the new IPS, to remove large debris and rags before the pumps. This will protect the pumps, fine screens, and further enhance the plant performance. Improvements listed under NT included installation of a new wet well, to house three pumps, two under NT, and room for a third pump for BO conditions. Majority of the mechanical and structural improvements for this item were expected to be completed under NT improvements. The following two tables summarize improvement criteria related to the existing and proposed stations.

Table 24 – Existing College Lift Station Improvement Criteria

Item	Existing 2024[1]	Existing 2024 + Committed	NT 2030	BO 2050
Application	Entire influent	Only for adjacent schools		
Metering devise	Mag meter (to be added)	See Table 25		
Type	Submersible			
Number of pumps and operation	2, Duty/standby			
Capacity	500 gpm[1]			
Power requirements	20 HP, 460 V, 3 Ph, 60 Hz			
Controls	Local duplex panel			
Wet well	6' diameter concrete			
Discharge size	6"			
Forcemain size	6"			

1. For existing it is our recommendation to improve the pump station with new pumps, controls, and mag meter, this was included as one of the existing system recommendations. See Appendix E for existing system needs.

The following table summarizes criteria of the proposed new influent lift station.

Table 25 – Influent Pump Station Improvement Criteria

Item	Existing 2024 + Committed	NT 2030	BO 2050
Flow application	All flow		All flow
Type	Submersible		Submersible
Number of units	2 (duty/standby), space for third		3 (Lead/lag + backup)
Capacity	1,200 gpm at 50 ft TDH		1,200 gpm at 50 ft TDH
Power	15 HP, 460 V, 3 Ph, 60 Hz		
Controls	Duplex panel w/ space for 3rd, NEMA 4x, AB Powerflex VFDs, Mag Meter, Level Transducer		

Wet well	9'Dia x 22' D Wet Well, 8'Dia vault
Discharge size	6”
Forcemain size	8” dual forcemain

7.2.2 Influent Screen

Influent screening is currently managed by two 0.4 MGD, 3 mm bar screens, with overall capacity of 0.8 MGD. It is recommended to size physical treatment elements like screens for PHF conditions. This facility meets the existing and committed PHF conditions discussed earlier. However, it is important to upgrade these screens for NT and ultimately BO. In addition, the existing bar screens do not provide fine screening recommended for MBR operation, which is typically done with 1-2 mm drum or basket screens. It is our recommendation to replace the existing bar screens with two 2-mm basket screens, each sized to meat NT PHF conditions.

The new tank mounted basket screens will be located within the existing screening facility. The existing bar screens would be dismantled and removed from the building to make room for the new installation. The building is anticipated to require additional improvements, including structural, electrical, and mechanical, to house the new screens. The existing 8” DIP feed lines and isolation valves will be reused with the new screen. Similarly, the discharge lines to the downstream biological treatment basins will be reused to the extents possible. Extra room in the Screening Facility will accommodate space for another basket screen installation for future expansion. Improvements under NT included modifications to the existing screening facility to house two drum/basket screens, one to be installed under NT and second for BO conditions. Piping and structural improvements for this secondary screen were expected to be completed under NT improvements.

Table 26 – Influent Screen Improvement Criteria

Item	Existing 2024 + Committed[1]	NT 2030	BO 2050
Type	Bar screen	Basket screen	Basket screen
Spacing	3 mm	2 mm	2 mm
Number of units	2	1	2
Capacity	278 gpm (0.4 MGD) each	1,200 gpm (1.7 MGD)	2,400 gpm (3.4 MGD total)
Power	0.5 HP, 480V, 3 Ph, 60 Hz	2 HP, 480V, 3 Ph, 60 Hz	
Controls	Local HOA, floats	NEMA 4x, AB MicroLogix PLC control panel, level sensors	

1. Common for existing and existing + committed

7.2.3 Anoxic Basins

Currently, the Anoxic Basins at the RDO WWTP are not being used for biological treatment purposes. The eastern most basin is completely empty, while the western most basin is being used as a wet well for the vertical turbine effluent pump. To meet existing nitrogen removal limits, it is recommended to recommission at least one of the basins to assist in the Biological Nutrient Removal (BNR). To meet NT conditions, the effluent pump and all associated appurtenances will need to be removed from the western basin to assist with the anoxic volume. Also, the influent piping would need to be extended to flow directly into these basins first, rather than dumping into the Aeration Basin (also known as pre-aeration or cyclical aeration basin). A mixer and an MLSS transfer pump would need to be placed into each of these basins to prevent the settling of particles and help conveyance of MLSS to the downstream Aeration Basin. A telescoping valve placed in each basin would draw RAS from the Membrane Basins and send it to the Anoxic Basins for mixing with the raw sewage. A wall thimble installed between the Anoxic Basins and the Aeration Basin will provide a means to install an Internal Recycle

(IR) pump in the future to further improve the denitrification process, if required. Exiting piping from the Aeration Basin to the MBR Basin will remain in place to continue transfer of MLSS to the downstream Membrane Basins.

To meet BO treatment conditions, the plant is anticipated to need a minimum anoxic capacity of approximately 80 kgal. This can be achieved by addition of one or two new anoxic basins, which will receive screening effluent from the new screening facility. In addition, this basin would require mixers, MLSS transfer pumps to send flow to the aeration basins. See table below for conceptual criteria of the anoxic improvements.

Table 27 – Anoxic Basin Improvement Criteria

Item	Existing 2024 + Committed[1]	NT 2030	BO 2050
Tank Size	One 11,800 gallon (4'W x 28'L x 17' D), at minimum	Two 11,800 gallon (4' W x 28' L x 17' D)	one 80,000 gallon (14' W x 54' L x 17' D) or two half size for redundancy
HRT at AAD	1 hour	1.3 hour	2.2 hours
Mixers	One 2.5 HP per tank	One 2.5 HP per tank	Two 3 HP
MLSS Transfer Pump	one 1,000 gpm, 7.5 HP	Two 1,000 gpm, 7.5 HP	Three 1,500 gpm, 10 HP

1. Common for existing and existing + committed

7.2.4 Aeration Basins

The main goal with the NT improvements is to reuse and repurpose the existing tank footprint as much as possible, without having to construct an additional aeration zone. These criteria are summarized in Table blow. As expected, NT upgrades to the Aeration Basin coincide with some of the upgrades for the anoxic zone, including the extension of the existing inlet piping. Similarly, the installation of a wall thimble for a future IR pump and piping to facilitate the transfer of MLSS from the anoxic zone to the aeration zone concur with upgrades discussed in the above section. In addition to these upgrades, the existing MLSS transfer pumps in the Aeration Basin would need to be upsized to handle NT conditions. The telescoping valves that currently transfer RAS from the membrane zone to the aeration zone will remain in place but will not be operational as part of these upgrades. These valves will provide operational flexibility if needed for future process modifications.

The BO condition is estimated to require a total process volume of 160 kgal. This can be achieved with two parallel aeration basins, each 80 kgal volume. The aeration basins were modeled assuming criterial below, to ensure the plan effluent meets the permit requirements under each scenario.

Table 28 – Aeration Basin Improvement Criteria

Item	Existing 2024 + Committed[1,2]	NT 2030	BO 2050
Number of basins	1		2
Tank Size	40,800 gallon (28' W x 13' L x 17' D)		80,000 gallon (27' W x 54' L x 17' D), total 160,000 gallon
Diffuser Type	Fine bubble tube diffuser		
DO setpoint	0.2 mg/L	0.6 mg/L	0.5 mg/L
Air requirement	515 scfm total[1]	760 scfm total	2,600 scfm total
Number of diffusers (density)	96 (12%)	192 (24%)	500 (17%) total
Air flow per diffuser	4.8 cfm	3.7 cfm	5.0 cfm

Standard Oxygen Transfer Efficiency (SOTE)	22%	28%	26%
HRT at AAD	4.6 hours	2.3 hours	3.8 hours
Blowers	Two (1 duty/1 standby) 550 SCFM Aerzen blowers, 35 HP[1]	Two (1 duty/1 standby) 750 SCFM, 50 HP	2 (1 duty/1 standby) 1500 SCFM blowers, 100 HP, per basin (4 total)

1. Modeling of the ADMM conditions for existing + committed suggests improving the existing blowers to 35 HP to meet 10 mg/L of TN conditions.

7.2.5 MBR Basins

The two, 20,500-gallon MBR Basins currently hold four RM 200 Submerged Membrane Units (SMUs) each (total of eight in both tanks), with total capacity of 0.30 MGD, at 12 gpd per sf flux rate, which is equal to the existing ADMM. To meet committed conditions, MBR units in one of the basins, at minimum, need to be replaced with units with larger surface area, to increase the plant capacity to 0.4/0.5 MGD (12/15 gpd/sf flux). This can be resolved by replacing four of the existing RM200 units with three SP 675 units. In addition, the permeate pumps need to be upsized to be able to handle this ADMM conditions.

To meet the NT conditions, all eight SMUs would be replaced with six SP 675 SMUs, three in each basin, for a total treatment capacity of 0.5/0.6 MGD, at 12/15 gpd per sf flux rate. These membrane units, depending on water parameters, can be operated at higher flux values and up to 15 gpd per sf. In addition, the three existing 0.20 MGD permeate pumps need to be replaced with three 500 gpm permeate pumps, with two 6" forcemains and 6" flow control valves. This will ensure there are enough capacity and redundancy to handle future conditions and support the MBR needs. Additional improvements needed under NT conditions are presented below. The existing MBR blowers seem sufficient to meet the NT conditions. Additional mechanical, structural, and electrical and instrumentation modifications are anticipated to be needed and within the gallery building to integrate the new membrane units into the existing plant.

To meet BO conditions, the plant is estimated to require a minimum of sixteen SP 675 MBR SMUs. These SMUs are expected to fit within the existing cyclical and MBR basins, assuming 48" OC and 28" center to wall spacing, with each basin containing 8 SMUs. To accommodate spacing there may be a need to add one of the anoxic basins into the MBR volume. With all SP 675 SMUs in service the plant can process an AAD of 1.3 MGD, at 12 gpd per sf flux rate. At flux rate of 15 gpd per sf, the plant will have a capacity of 1.7 MGD (1.6 sf). To accommodate for these units, the MBR basin and piping proposed for NT needs to be modified to house an additional unit. In addition, additional similar appurtenances including permeate pumps, piping and valves, RAS pumps, instrumentation, etc. are expected to be required for this phasing. Conceptual criteria for this process step are summarized below.

Table 29 – MBR Improvement Criteria

Item	Existing 2024 + Committed[2]	NT 2030	BO 2050
Number of basins	2		2
Tank Size	20,500 gallon (13.5' W x 14' L x 17' D)		45,000 gallon (32' W x 14' L x 17' D), total 90,500 gallon
Number of cassettes	3/4, Total 7	3 per tank	8 per tank, total 16
Maximum capacity at 15 gpm/sf flux	0.51 MGD total[2]	0.65 MGD total	1.7 MGD total
SRT[1]	12 days	8 days	8 days
MLSS [g/L]	13.5	14.4	15.5
HRT at AAD	6.3 hours	3.2 hours	1.9 hours
MBR Models	Kubota RM200/SP675	Kubota SP675	Kubota SP675

Blowers	Two (1 duty/1 standby) 1,125 SCFM Aerzen blowers, 60 HP		Two (1 duty/1 standby) 1,125 SCFM blowers, 60 HP, per basin, total four
Diffusers	Coarse bubble		
Permeate pumps	Three (2 duty/1 standby) 350 gpm, VFDs	Three (2 duty/1 standby) 500 gpm, VFDs	Three (2 duty/1 standby) 500 gpm, VFDs, per MBR basin, total six
MLSS Transfer pumps	500 gpm	1,000 gpm	1,500 gpm

1. Total process SRT
2. Existing MBR modules max out at 375,000 gpd, assuming 15 gpd/sf flux, which is lower than standard ADMM needed.

7.2.6 Disinfection

No improvement is anticipated for the existing UV system under NT conditions and the existing system seem to have enough capacity to operate under future scenarios. However, to be able to handle the BO conditions, the existing capacity is expected to need to be doubled.

Table 30 – Disinfection Improvement Criteria

Item	Existing 2024 + Commited[1]	NT 2030	BO 2050
Number of units	2		5
Capacity per unit	278 gpm (0.4 MGD), 0.8 MGD total		278 gpm (0.4 MGD), 2.0 MGD total

1. Common for existing and existing + committed

7.2.7 Effluent Pump Station

The existing Effluent Pump Station (EPS) currently uses a single 500 gpm (0.7 MGD) vertical turbine pump, which is slightly bigger than existing PHF of 0.6 MGD. However, the pump seems to be 20 years old and has no redundancy. In addition, currently the EPS sits in the existing west anoxic basin, making it difficult for this basin to be used for process volume. To meet existing conditions, it is recommended for this pump to be replaced at minimum or be supported with a secondary redundant, see Section 6.4. To meet future conditions, it is recommended to relocate the pump into a new wet well and include two pumps (1 duty/1 standby) with additional room for a third pump that can be incorporated into the new effluent wet well, to meet BO requirements. Conceptual criteria of these pumps are presented below.

Table 31 – Effluent Pump Station Improvement Criteria

Item	Existing 2024 + Committed[1]	NT 2030	BO 2050
Number of units	2 (duty/standby)	2	3 (lead/lag)
Capacity	600 gpm at 180 ft TDH	900 gpm at 100 ft TDH[1]	2,200 gpm at 180 ft TDH[1]
Irrigation line	6” PVC	10” PVC[1]	6” + 10” PVC
Controls	Duplex with room for third (duty/standby)	Duplex with room for third (duty/standby)	Triplex (lead/lag/backup)

1. Conceptual TDH based on minimum line size and double forcemain, to be verified during design.
2. See Section 6.4 for existing system needs.

7.2.8 Solids Handling

Currently, sludge wasted from the MBR basin are stored and digested into the 94,000-gal Aerobic Digester basin. Sludge is aerated using two 25 HP blowers located east of the basin and is disposed of via truck hauling to the land disposal location once or twice a week. On average, about 14,000 gal/week of sludge (2,000 gpd) is currently being disposed. The annual costs associated with this land disposal is reported to be about $85k for 2023. The WAS MLSS concentration is reported to be between 10-13 g/l, i.e., 1-1.3% solids content. Assuming 1% solids content, it is estimated that NMWS pays about $0.09 per gallon for current sludge hauling. Considering sludge projections shown in Table 20, it is estimated that the hauling

costs will increase to $340k for 2030 conditions, and $1M for 2050, without installation of a solids handling facility to reduce future sludge volumes. Therefore, to meet the future needs, it is our recommendation to:

- Install a new sludge dewatering facility with a screw press unit, with a standby unit for BO conditions. This system is expected to increase the solids content to 15% and significantly reduce the disposal volume.
- Optionally, reuse the existing MBR and permeate pumps in the Aerobic Digester basin for sludge membrane thickening. As an additional measure, this method can increase the digester solids content by thickening up to 2-3%.

Water Works recommends installation of a screw press facility that can be upsized for BO condition. This facility is expected to reduce the sludge volume by 90% and ultimately reduce future hauling and disposal costs. Water Works predicts up to 90% costs saving with either of the following disposal methodologies:

- Land disposal and hauling – reduced sludge volume provides hauling cost savings up to 93%, i.e., $18K/yr and $70K/yr. However, it is important to improve the digester to ensure TN limits are met. At the current sludge average TN of 700 mg/L (2024), it is estimated that minimum 45 acres of land will be required to maintain the 200 lb TN/acre/year threshold for 2050. This method may have future potential regulation limitations with respect to emerging contaminants like Per- and Polyfluoroalkyl Substances (PFAS).
- Landfill disposal – reduced sludge volume provides disposal cost savings up to 92%, i.e., $20K/yr and $80K/yr for 2030 and 2050 disposal rates. One advantage of this disposal method is that NMWS does not need to consider additional treatment at site.

The proposed solids handling improvement criteria are summarized in table below. Costs associated with these two improvements are shown in Appendix E. As shown under NT OPCC, a new screw press facility is expected to cost about $2M for NT. This is expected to be paid off in about ten years of operation, using the cost savings mentioned above. This is estimated to leave an additional ten years of operation once the system is paid off and allows the system to be expanded for BO conditions. In addition, currently there is no clear direction regarding removal of PFAS or other potential emerging contaminants. However, the NMED is working on developing these guidelines, which if regulated and implemented, makes the landfill disposal a more appealing alternative. The proposed sludge dewatering facility will be a key step pretreatment for such potential treatment requirements.

Table 32 – Solids Handling Improvement Criteria

Item	Existing 2024 + Committed[1]	NT 2030	BO 2050
Number of Basins	1		
Basin capacity	One 94,000 gallon (28' L x 32' W x 17' D) digester		
Blowers	Two (1 duty/1 standby) 404 SCFM Aerzen blowers, 25 HP		Two (1 duty/1 standby) 600 SCFM, 50 HP[2]
Diffusers	28 coarse bubble		28 coarse bubble[2]
Min land needed	8 ac, 700 mg/L TN	15 ac, 800 mg/L	45 ac, 820 mg/L
Dewatering units	Not Applicable	1 x screw press, 30 gpm at 1%	2 screw press, 30 gpm at 1%
1% WAS loading	6,000 gpd (4 gpm)	10,000 gpd (7 gpm)	30,000 gpd (20 gpm)
Solids loading	460 lb/day	834 lb/day	1,850 lb/day
Sludge Feed Pump	Not Applicable	40 gpm, 3 HP	Two 40 gpm, 3 HP
WAS pumps	Two 160 gpm, 0.5 MGD		

1. Common for existing and existing + committed
2. Number, type of diffusers, and blowers to be designed based on disposal application.

7.2.9 Electrical, Instrumentation, and Controls

Current service connection and standby 350 kW generator have sufficient capacity for the existing and NT improvements. All proposed NT and BO improvements will require modifications to the plant electrical and SCADA controls. Estimated cost of these improvements are included in each improvement. Also, the existing generator will likely need to be upsized for the BO conditions.

Table 33 – E&IC Improvement Criteria

Item	Existing 2024	NT 2032	BO 2050[1]
Service connection size	800 Amps		1000 Amps
Estimated service needed	450 Amps	500 Amps	1000 Amps
Generator size	350 kW		Two 350 kW, or one 500 kW

1. To be verified during design

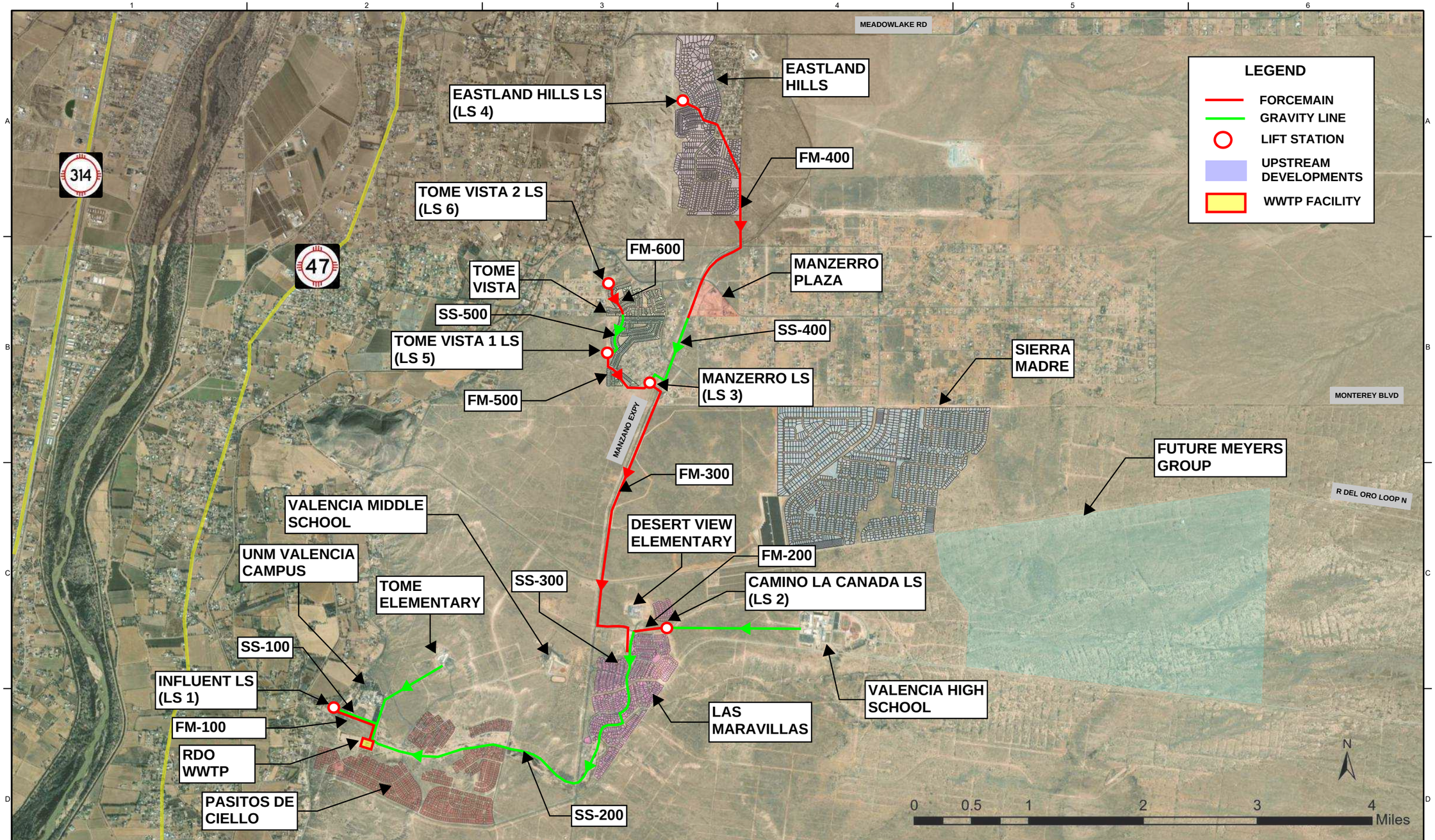
8 Capital Improvement Plan

The Capital Improvement Plan (CIP) outlines improvements required to meet future growth and hydraulic conditions within the RDO Sanitary Sewer system. The CIP is packaged into recommended projects for existing, committed, 2030, and 2050 based on current needs and future developments. The Process Flow Diagrams associated with these recommendations are presented in Appendix C. Below is a summary of the total estimated project costs per scenario:

- **2024 improvements, with no capacity increase**: $2.8M or $2k per EDU
- **2024 + Committed improvements**: $5.6M or $23.5k per EDU. This reduces to $2.8M, $11.7k per EDU, and $40/gallon capacity increase, when excluding costs associated with the existing improvements
- **NT 2030 improvements**: $11.4M or $14k per EDU, inclusive of 2024 + committed improvements, i.e., combined. This reduces to $5.8M total, $10k per EDU, and $34/gallon, when excluding costs associated with the existing + committed improvements
- **BO 2050 improvements**: $33.8M total, $10k per EDU, and $51/gallon capacity added, which will be in addition to the NT improvements

The estimated OPCC associated with these improvements, along with final project costs are presented in Appendix E. OPCCs presented include 25% design contingency, 25% contractor overhead, as well as 10% construction contingency for unforeseen conditions. The proposed equipment, appurtenances, sizes, and cost estimates provided are conceptual level. In addition, OPCCs provided do not include costs involved with land, easement, or Right of Way (ROW) acquisitions, permitting, or other potential soft costs. Presented OPCCs are based on the 2024 dollar and have not been forecasted for future.

Appendix A – Maps and Schematics



VERIFY SCALE BAR IS ONE INCH ON ORIGINAL DRAWING 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	NO	DATE	REVISION	BY	APVD	PRELIMINARY NOT FOR CONSTRUCTION	DESIGN DRAWN CHECKED APPROVED

WATERWORKS ENGINEERS
8650 Alameda Blvd., NE, Suite 103E Albuquerque, NM

NEW MEXICO WATER SERVICE COMPANY

RIO DEL ORO SANITARTY SEWER MASTER PLAN UPDATE

VALENCIA COUNTY, NEW MEXICO

APPENDIX A
OVERVIEW MAP

DATE	OCTOBER 2024
PROJECT NO.	24-007
DRAWING NO.	1
SHEET NO.	1

Appendix B – Hydraulic Modeling Results

ATTACHMENT 1

New Mexico Water - Rio Del Oro Sewer System
Existing Conditions - Peak Hourly Flow (PHF)

Legend

MH Flood Depth (ft)
- Within 3 FT
- Within 1 FT
- Potential SSO

Pipe Max Surcharge (d/D)
- 0 - 0.49
- 0.50 - 0.74
- 0.75 - 0.84
- 0.85 - 0.99
- 1
- 2

Section 1
Section 2
Section 3
Section 4
El Cerro
University of New Mexico-Valencia
Valencia Torne Cemetery
Veterans Park Soccer Complex
La Cañada de la Loma de Arena
La Bonita Park
Las Manzanas Park

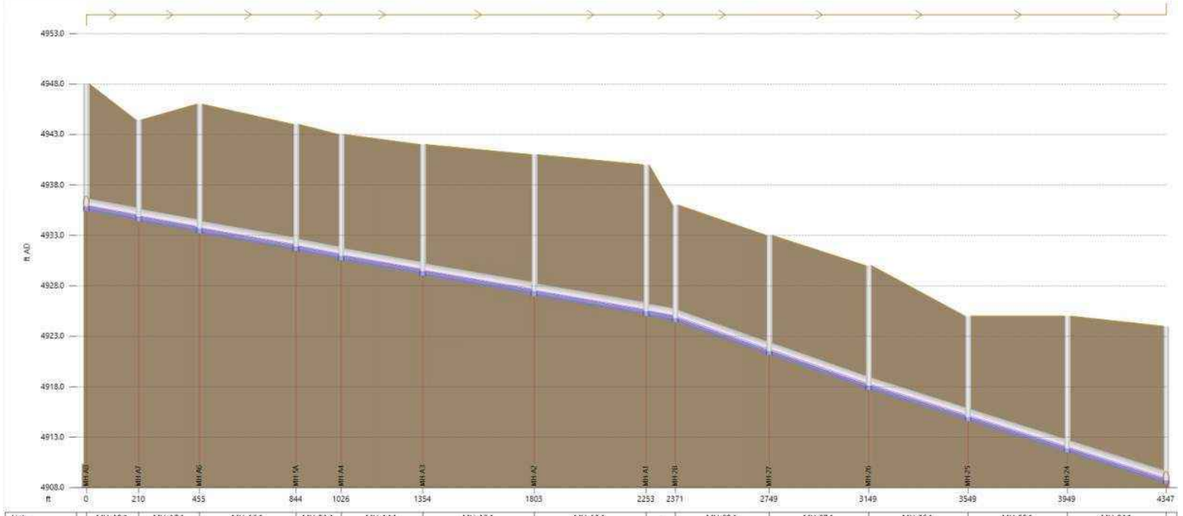
N

0 500 1,000 2,000 Feet

New Mexico Water - Rio Del Oro Sewer System
Existing Conditions - Peak Hourly Flow (PHF)
Existing 15" Trunkline Pipe Profiles

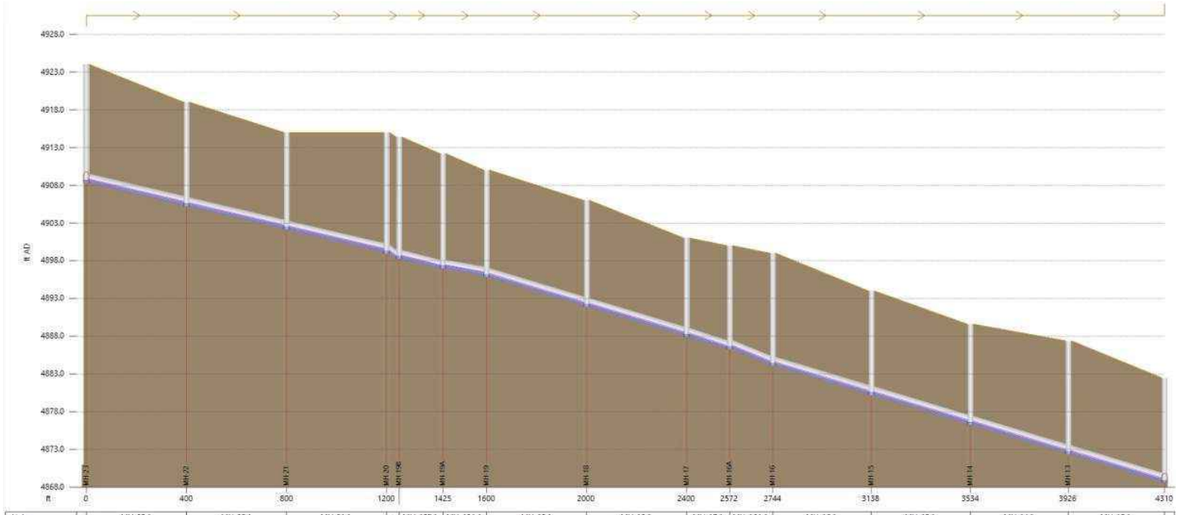
Link	MH-1E.1		MH-1D.1		MH-1B.1		MH-4A.1	MH-3A.1		MH-1A.1		MH L6-F.1	MH L6-E.1	MH L6-D.1	MH L6-B.1		MH-A14.1	MH-A13.1	MH-A12.1	MH-A11.1	MH-A10.1	MH-A9.1
width (in)	15.0		15.0		15.0		15.0	15.0	15.0	15.0		15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.149		0.113		0.309		0.415	0.194	0.382	0.228		0.197	3.215	5.169	4.499		0.667	3.629	1.012	0.402	0.402	0.400
ds inv (ft AD)	4997.310		4996.880		4995.290		4994.310	4993.910		4993.000		4991.910	4985.970	4968.170	4955.510		4953.340	4940.540	4938.720	4937.770	4936.580	4935.620
surc	0.42		0.45		0.39		0.32	0.39	0.33	0.37		0.39	0.21	0.19	0.25	0.33	0.29	0.21	0.27	0.32	0.32	0.32
DS flow (MGD)	0.5944		0.5925		0.5913		0.5907	0.5903		0.5898		0.5890	0.5888	0.5888	0.5886		0.5883	0.5881	0.5880	0.5878	0.5874	0.5872
DS velocity (ft/s)	2.248		2.926		2.032		2.868	2.914	2.900	2.911		2.912	4.762	5.419	3.740		3.148	4.923	3.381	2.896	2.895	2.895
Node	MH-1E		MH-1D	MH-1C	MH-1B		MH-4A	MH-3A				MH L6-F	MH L6-E	MH L6-D	MH L6-B	MH L6-A		MH-A13	MH-A12	MH-A11	MH-A10	MH-A9	

Section 1



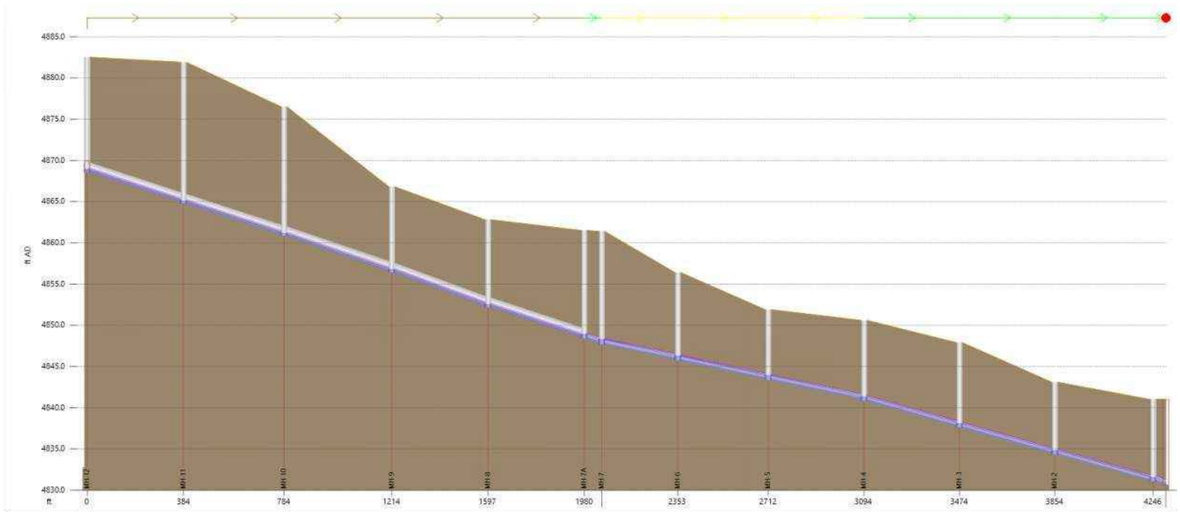
Link	MH-A8.1	MH-A7.1	MH-A6.1	MH-5A.1	MH-A4.1	MH-A3.1	MH-A2.1		MH-2B.1	MH-2.1	MH-2G.1	MH-2F.1	MH-2E.1	MH-2D.1
width (in)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.400	0.400	0.401	0.400	0.399	0.401	0.400	0.346	0.809	0.810	0.730	0.727	0.727	0.736
ds inv (ft AD)	4934.580	4933.400	4931.640	4930.710	4929.200	4927.200	4925.200	-	4921.330	4917.890	4914.770	4911.660	4908.530	
surc	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.33	0.27	0.27	0.28	0.28	0.28	
DS flow (MGD)	0.5870	0.5866	0.5862	0.5860	0.5856	0.5851	0.5846	0.5845	0.5643	0.5841	0.5838	0.5836	0.5833	
DS velocity (ft/s)	2.895	2.894	2.893	2.893	2.893	2.892	2.891	2.894	3.359	3.360	3.241	3.237	3.250	
Node	-	MH-A7	MH-A6	MH-5A	MH-A4	MH-A3	MH-A2	MH-A1	MH-2B	MH-2	MH-2G	MH-2F	MH-2E	MH-2D

Section 2



Link	MH-23.1	MH-22.1	MH-21.1		MH-19B.1	MH-19A.1	MH-19.1	MH-18.1	MH-17.1	MH-16A.1	MH-16.1	MH-15.1	MH-14.1	MH-13.1
width (in)	15.0	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.733	0.730	0.730	-	0.732	0.520	0.940	0.940	0.941	1.168	0.941	0.940	0.940	0.941
ds inv (ft AD)	4905.400	4902.280	4899.160	-	4896.950	4896.040	4892.080	4888.120	4886.300	4884.290	4880.380	4876.460	4872.580	4868.760
surc	0.28	0.28	0.28	-	0.30	0.30	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
DS flow (MGD)	0.5831	0.5829	0.5826	-	0.5824	0.5823	0.5821	0.5820	0.5818	0.5818	0.5816	0.5814	0.5813	0.5811
DS velocity (ft/s)	3.244	3.239	3.239	-	2.878	2.881	3.533	3.533	3.517	3.520	3.533	3.532	3.531	3.533
Node	MH-23	MH-22	MH-21	MH-20	-	MH-19A	MH-19	MH-18	MH-17	MH-16A	MH-16	MH-15	MH-14	MH-13	MH-12

Section 3



Link	MH-12.1	MH-11.1	MH-10.1	MH-9.1	MH-8.1		MH-7.1	MH-6.1	MH-5.1	MH-4.1	MH-3.1	MH-2.1	
width (in)	15.0	15.0	15.0	15.0	15.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	-
grad (%)	0.941	0.935	0.979	1.050	0.940	-	0.594	0.600	0.602	0.808	0.808	0.791	-
ds inv (ft AD)	4864.950	4861.070	4856.600	4852.380	4848.580	-	4845.900	4843.540	4841.040	4837.770	4834.500	4831.200	-
surc	0.26	0.26	0.26	0.27	0.26	0.74	0.65	0.82	0.81	0.70	0.70	0.71	-
DS flow (MGD)	0.5809	0.5808	0.5805	0.5804	0.5803	-	0.5781	0.5766	0.5757	0.5756	0.5754	0.5753	-
DS velocity (ft/s)	3.532	3.524	3.580	3.403	3.529	-	3.540	3.536	3.533	3.527	3.526	3.526	-
Node	MH-12	MH-11	MH-10	MH-9	MH-8	MH-7A	MH-7	MH-6	MH-5	MH-4	MH-3	MH-2	MH-1

Section 4

ATTACHMENT 2

New Mexico Water - Rio Del Oro Sewer System
Existing + Committed - Peak Hourly Flow (PHF)

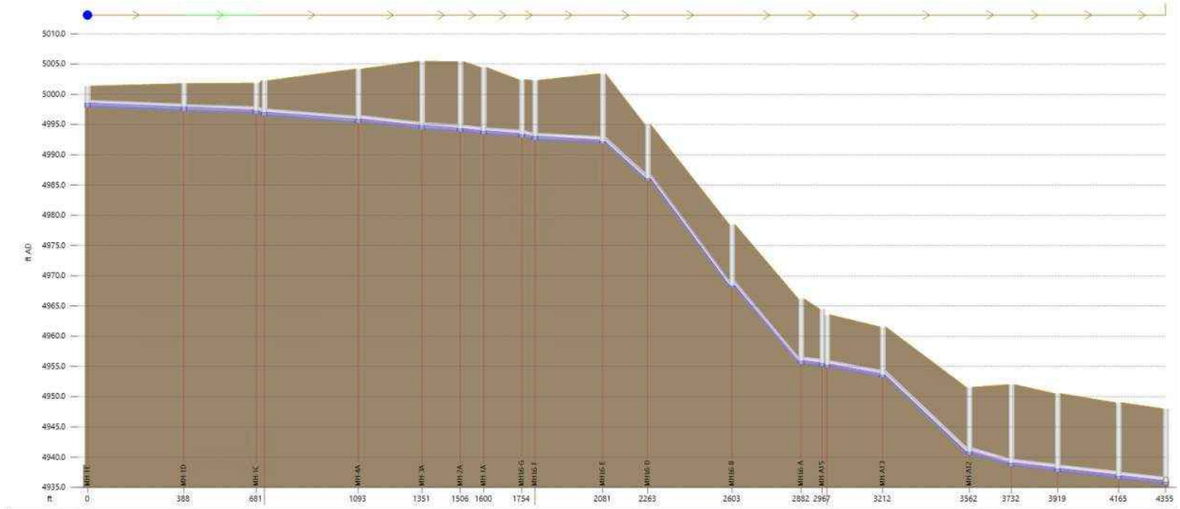
Legend

MH Flood Depth (ft)
- Within 3 FT
- Within 1 FT
- Potential SSO

Pipe Max Surcharge (d/D)
- 0 - 0.49
- 0.50 - 0.74
- 0.75 - 0.84
- 0.85 - 0.99
- 1
- 2

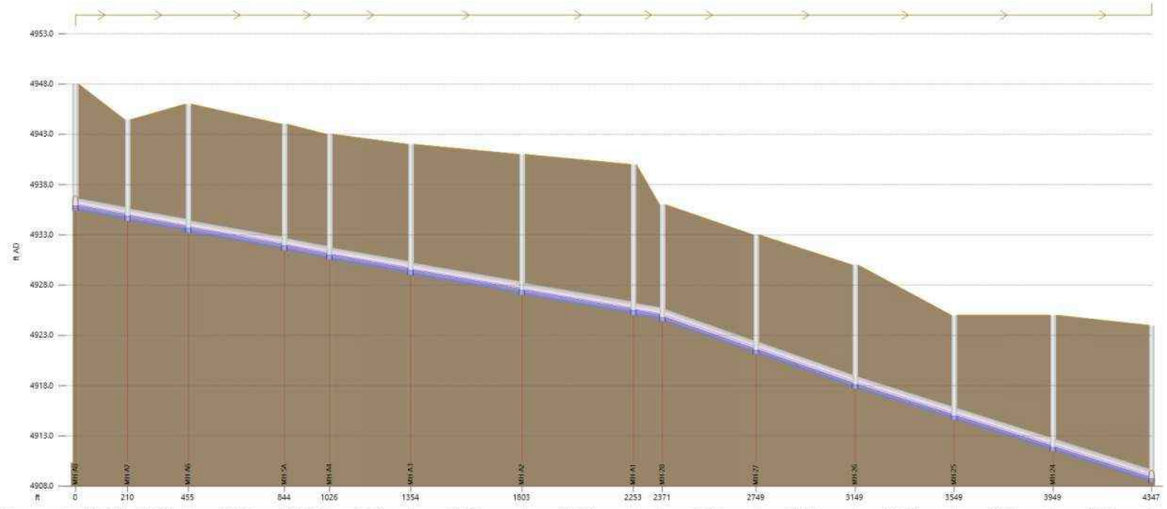
Section 1
Section 2
Section 3
Section 4
El Cerro
University of New Mexico-Valencia
Valencia Torne Cemetery
Veterans Park Soccer Complex
La Cañada de la Loma de Arena
La Bonita Park
Las Manzanas Park
N
0 500 1,000 2,000 Feet

New Mexico Water - Rio Del Oro Sewer System
Existing + Committed - Peak Hourly Flow (PHF)
Existing 15" Trunkline Pipe Profiles



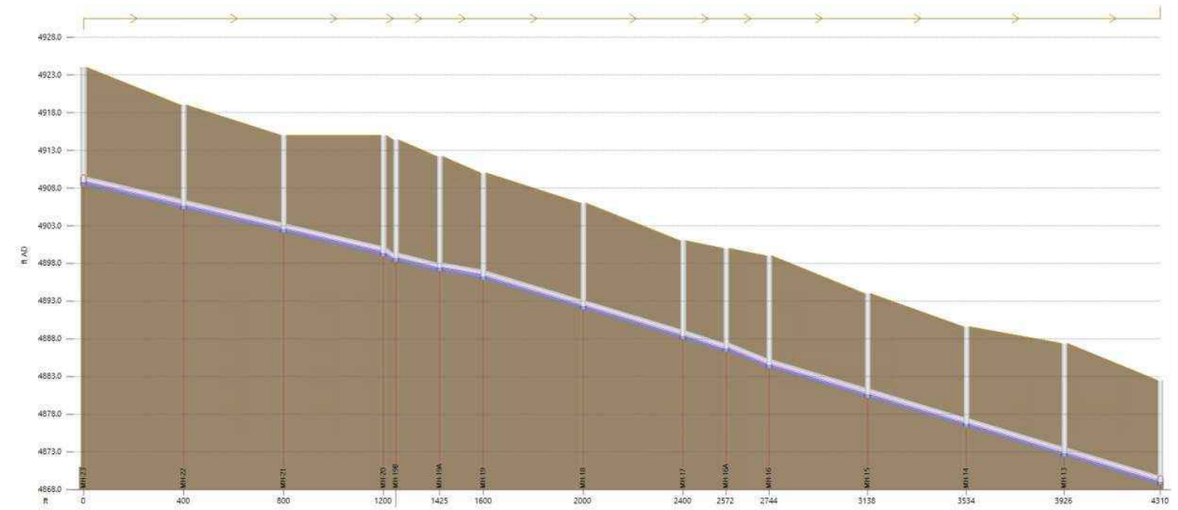
Link	MH-1E.1	MH-1D.1	MH-1B.1	MH-4A.1	MH-3A.1	-	MH-1A.1	MH-L6-F.1	MH-L6-E.1	MH-L6-D.1	MH-L6-B.1	-	MH-A14.1	MH-A13.1	MH-A12.1	MH-A11.1	MH-A10.1	MH-A9.1
width (in)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.149	0.113	0.309	0.415	0.194	0.382	0.228	0.197	3.215	5.169	4.499	-	0.667	3.629	1.012	0.402	0.402	0.400
ds inv (ft AD)	4997.310	4996.880	4995.290	4994.310	4993.910	-	4993.000	4991.910	4985.970	4968.170	4955.510	-	4953.340	4940.540	4938.720	4937.770	4936.580	4935.620
surc	0.50	0.52	0.45	0.37	0.45	0.38	0.43	0.45	0.24	0.22	0.30	0.38	0.33	0.23	0.31	0.38	0.38	0.38
DS flow (MGD)	0.7916	0.7882	0.7860	0.7551	0.7944	-	0.7834	0.7820	0.7818	0.7817	0.7815	-	0.7809	0.7806	0.7805	0.7801	0.7795	0.7791
DS velocity (ft/s)	2.341	3.184	2.297	2.966	3.173	3.143	3.169	3.170	5.371	6.162	3.825	-	5.429	5.862	3.751	3.155	3.155	3.154
Node	MH-1E	MH-1D	MH-1C	MH-1B	MH-4A	MH-3A	-	-	-	MH L6-F	MH L6-E	MH L6-D	MH L6-B	MH L6-A	-	MH-A13	MH-A12	MH-A11	MH-A10	MH-A9	-

Section 1



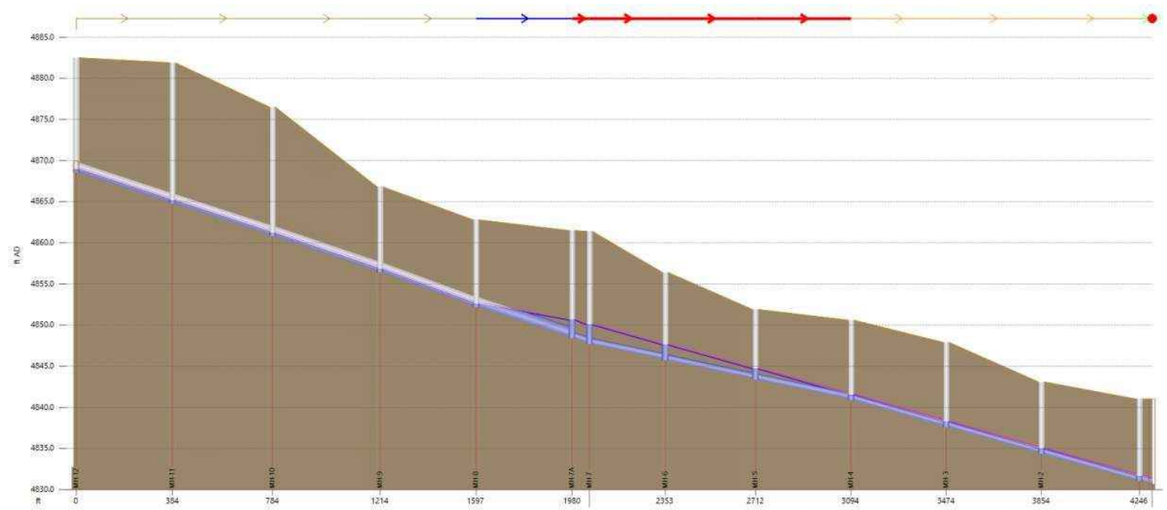
Link	MH-A8.1	MH-A7.1	MH-A6.1	MH-5A.1	MH-A4.1	MH-A3.1	MH-A2.1	-	MH-2B.1	MH-27.1	MH-26.1	MH-25.1	MH-24.1
width (in)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.400	0.400	0.401	0.400	0.399	0.401	0.400	0.348	0.809	0.810	0.730	0.727	0.736
ds inv (ft AD)	4934.580	4933.400	4931.640	4930.710	4929.200	4927.200	4925.200	-	4921.330	4917.890	4914.770	4911.660	4908.530
surc	0.38	0.38	0.38	0.38	0.38	0.37	0.37	0.39	0.31	0.31	0.32	0.32	0.32
DS flow (MGD)	0.7786	0.7781	0.7772	0.7769	0.7762	0.7753	0.7745	0.7744	0.7740	0.7735	0.7732	0.7727	0.7723
DS velocity (ft/s)	3.154	3.153	3.152	3.152	3.151	3.150	3.149	3.151	3.660	3.661	3.529	3.525	3.539
Node	-	MH-A7	MH-A6	MH-5A	MH-A4	MH-A3	MH-A2	MH-A1	MH-2B	MH-27	MH-26	MH-25	MH-24	MH-23

Section 2



Link	MH-23.1	MH-22.1	MH-21.1	-	MH-19B.1	MH-19A.1	MH-19.1	MH-18.1	MH-17.1	MH-16A.1	MH-16.1	MH-15.1	MH-14.1	MH-13.1
width (in)	15.0	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.733	0.730	0.730	-	0.732	0.520	0.940	0.940	0.941	1.168	0.941	0.940	0.940	0.941
ds inv (ft AD)	4905.400	4902.280	4899.160	-	4896.950	4896.040	4892.080	4888.120	4886.300	4884.290	4880.380	4876.460	4872.580	4868.760
surc	0.32	0.32	0.32	-	0.35	0.35	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
DS flow (MGD)	0.7720	0.7714	0.7711	-	0.7708	0.7706	0.7702	0.7700	0.7698	0.7697	0.7694	0.7690	0.7687	0.7685
DS velocity (ft/s)	3.532	3.527	3.527	-	3.129	3.138	3.851	3.851	3.852	3.908	3.852	3.850	3.848	3.850
Node	MH-23	MH-22	MH-21	MH-20	-	MH-19A	MH-19	MH-18	MH-17	MH-16A	MH-16	MH-15	MH-14	MH-13	MH-12

Section 3



Link	MH-12.1	MH-11.1	MH-10.1	MH-9.1	MH-8.1	-	MH-7.1	MH-6.1	MH-5.1	MH-4.1	MH-3.1	MH-2.1	-
width (in)	15.0	15.0	15.0	15.0	15.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	-
grad (%)	0.941	0.935	0.879	1.050	0.940	-	0.594	0.600	0.602	0.808	0.808	0.791	-
ds inv (ft AD)	4864.950	4861.010	4856.600	4852.380	4848.580	-	4845.900	4843.540	4841.040	4837.770	4834.500	4831.200	-
surc	0.30	0.30	0.30	0.30	1.00	2.00	2.00	2.00	2.00	0.94	0.94	0.97	-
DS flow (MGD)	0.7682	0.7679	0.7675	0.7673	0.6980	-	0.6888	0.6876	0.6873	0.6860	0.6846	0.6836	-
DS velocity (ft/s)	3.850	3.841	3.902	3.773	3.607	-	3.645	3.630	3.837	3.828	3.824	3.822	-
Node	MH-12	MH-11	MH-10	MH-9	MH-8	MH-7A	MH-7	MH-6	MH-5	MH-4	MH-3	MH-2	MH-1

Section 4

ATTACHMENT 3

New Mexico Water - Rio Del Oro Sewer System
Near-Term (NT) 2030 - Annual Average Day (AAD)

Eastland Hills

Eastland Hills LS

Red junctions along EHLS forcemain are "break" nodes in model (which are necessary model elements along a pressure pipeline, not regular manholes), and are not experiencing an sewer spill during simulation.

Manzerro Plaza

Tome Vista

EHLS forcemain discharge manhole

Break nodes along Manzerro forcemain; not spilling

Manzerro LS

Desert View Elementary

Valencia High School

Tome Elementary

Valencia Middle School

UNM - Valencia

Las Maravillas

Pasitos Del Cielo & Habitat

Los Lunas Sports Complex

Valencia

Legend

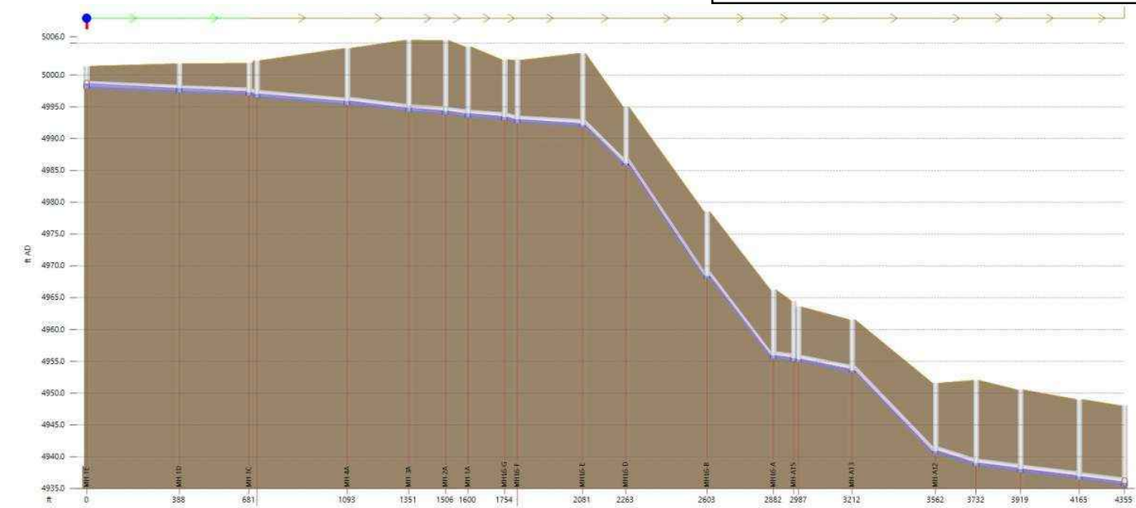
MH Flood Depth (ft)
- Within 3 FT
- Within 1 FT
- Potential SSO

Pipe Max Surcharge (d/D)
- 0 - 0.49
- 0.50 - 0.74
- 0.75 - 0.84
- 0.85 - 0.99
- 1
- 2

N

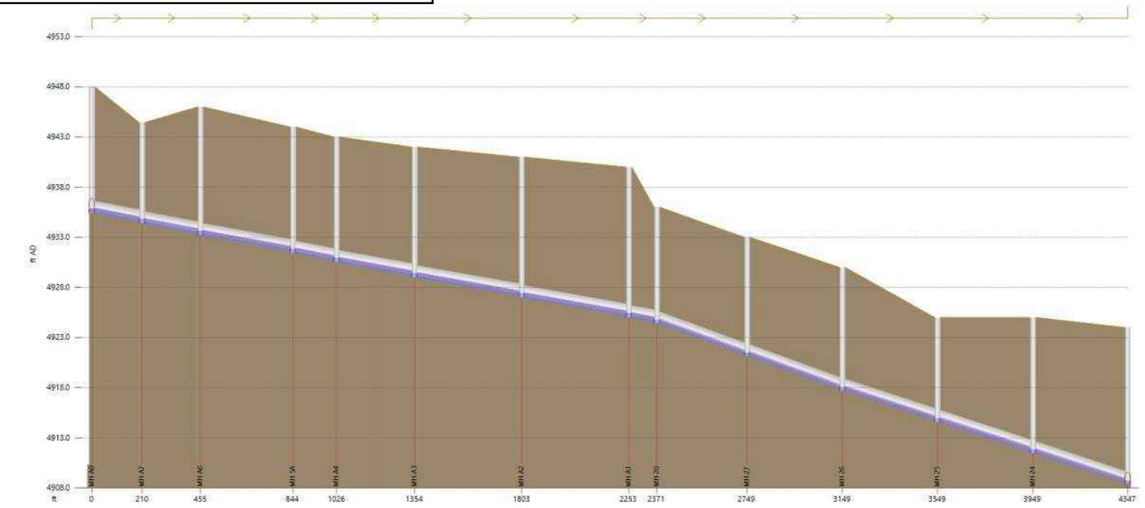
0 1,500 3,000 6,000 Feet

New Mexico Water - Rio Del Oro Sewer System
Near-Term (NT) 2030 - Annual Average Day (AAD)
Existing 15" Trunkline Pipe Profiles



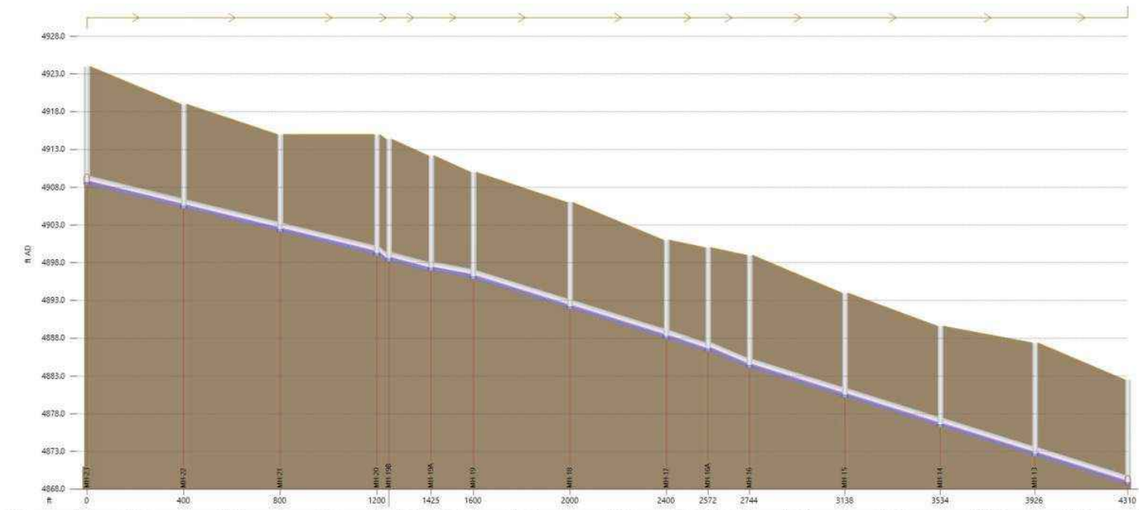
Link	MH-1E.1	MH-1D.1	-	MH-1B.1	MH-4A.1	MH-3A.1	-	MH-1A.1	-	MH-L6-F.1	MH-L6-E.1	MH-L6-E.1	MH-L6-D.1	MH-L6-B.1	-	MH-A14.1	MH-A13.1	MH-A12.1	MH-A11.1	MH-A10.1	MH-A9.1
width (in)	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.149	0.113	-	0.309	0.415	0.194	0.382	0.228	-	0.197	3.215	5.169	4.499	-	0.667	3.629	1.012	0.402	0.402	0.400	
ds inv (ft AD)	4997.310	4996.880	-	4995.290	4994.310	4993.910	-	4993.000	-	4991.910	4985.970	4968.170	4955.510	-	4953.340	4940.540	4938.720	4937.770	4936.580	4935.620	
surc	0.54	0.51	-	0.42	0.34	0.40	0.34	0.38	-	0.39	0.21	0.20	0.26	0.34	0.29	0.21	0.27	0.32	0.32	0.32	
DS flow (MGD)	0.8183	0.7199	-	0.6466	0.6530	0.6360	-	0.6108	-	0.5801	0.5947	0.5879	0.5883	-	0.5914	0.5883	0.5865	0.5789	0.5694	0.5629	
DS velocity (ft/s)	3.008	3.099	-	2.073	2.988	2.980	2.954	2.941	-	2.899	4.784	5.415	3.726	-	3.153	4.923	3.378	2.882	2.868	2.858	
Node	MH-1E	MH-1D	MH-1C	MH-1B	MH-4A	MH-3A	-	-	-	MH L6-F	MH L6-E	MH L6-D	MH L6-B	MH L6-A	-	MH-A13	MH-A12	MH-A11	MH-A10	MH-A9	-

Section 1



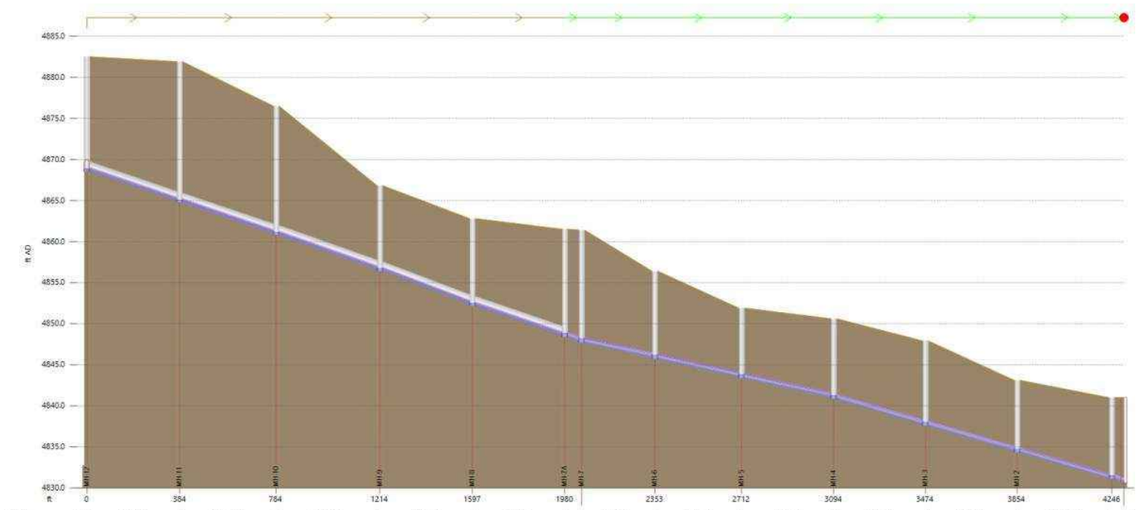
Link	MH-A8.1	MH-A7.1	MH-A6.1	MH-5A.1	MH-A4.1	MH-A3.1	MH-A2.1	-	MH-28.1	MH-27.1	MH-26.1	MH-25.1	MH-24.1
width (in)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.400	0.400	0.401	0.400	0.399	0.401	0.400	0.348	0.809	0.810	0.730	0.727	0.736
ds inv (ft AD)	4934.580	4933.400	4931.640	4930.710	4929.200	4927.200	4925.200	-	4921.330	4917.890	4914.770	4911.660	4908.530
surc	0.32	0.31	0.31	0.31	0.31	0.31	0.30	0.31	0.25	0.25	0.26	0.26	0.25
DS flow (MGD)	0.5556	0.5462	0.5355	0.5311	0.5240	0.5126	0.5033	0.5010	0.4973	0.4925	0.4891	0.4850	0.4812
DS velocity (ft/s)	2.847	2.832	2.816	2.809	2.797	2.779	2.764	2.763	3.193	3.185	3.067	3.055	3.060
Node	-	MH-A7	MH-A6	MH-5A	MH-A4	MH-A3	MH-A2	MH-A1	MH-28	MH-27	MH-26	MH-25	MH-24	MH-23

Section 2



Link	MH-23.1	MH-22.1	MH-21.1	-	MH-19B.1	MH-19A.1	MH-19.1	MH-18.1	MH-17.1	MH-16A.1	MH-16.1	MH-15.1	MH-14.1	MH-13.1
width (in)	15.0	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.733	0.730	0.730	-	0.732	0.520	0.940	0.940	0.941	1.168	0.941	0.940	0.940	0.941
ds inv (ft AD)	4905.400	4902.280	4899.160	-	4896.950	4896.040	4892.080	4888.120	4886.300	4884.290	4880.380	4876.460	4872.580	4868.760
surc	0.25	0.25	0.25	-	0.27	0.27	0.24	0.24	0.24	0.24	0.24	0.24	0.23	0.24
DS flow (MGD)	0.4778	0.4735	0.4829	-	0.4807	0.4789	0.4757	0.4736	0.4723	0.4709	0.4690	0.4663	0.4644	0.4746
DS velocity (ft/s)	3.048	3.036	3.055	-	2.719	2.715	3.314	3.309	3.238	3.236	3.300	3.293	3.288	3.313
Node	MH-23	MH-22	MH-21	MH-20	-	MH-19A	MH-19	MH-18	MH-17	MH-16A	MH-16	MH-15	MH-14	MH-13	MH-12

Section 3



Link	MH-12.1	MH-11.1	MH-10.1	MH-9.1	MH-8.1	-	MH-7.1	MH-6.1	MH-5.1	MH-4.1	MH-3.1	MH-2.1	-
width (in)	15.0	15.0	15.0	15.0	15.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	-
grad (%)	0.941	0.935	0.979	1.050	0.940	-	0.594	0.600	0.602	0.808	0.808	0.791	-
ds inv (ft AD)	4864.950	4861.010	4856.600	4852.380	4848.580	-	4845.900	4843.540	4841.040	4837.770	4834.500	4831.200	-
surc	0.24	0.24	0.23	0.24	0.23	-	0.67	0.67	0.66	0.60	0.60	0.60	-
DS flow (MGD)	0.4725	0.4705	0.4685	0.4669	0.4646	-	0.4614	0.4591	0.4582	0.4562	0.4544	0.4529	-
DS velocity (ft/s)	3.308	3.296	3.343	3.124	3.289	-	3.223	3.216	3.214	3.234	3.231	3.202	-
Node	MH-12	MH-11	MH-10	MH-9	MH-8	MH-7A	MH-7	MH-6	MH-5	MH-4	MH-3	MH-2	MH-1

Section 4

New Mexico Water - Rio Del Oro Sewer System
Near-Term (NT) 2030 - Average Day Max Month (ADMM)

Eastland Hills

Eastland Hills LS

Red junctions along EHLS forcemain are "break" nodes in model (which are necessary model elements along a pressure pipeline, not regular manholes), and are not experiencing an sewer spill during simulation.

Manzerro Plaza

Tome Vista

EHLS forcemain discharge manhole

Break nodes along Manzerro forcemain; not spilling

Manzerro LS

Desert View Elementary

Valencia High School

Tome Elementary

Valencia Middle School

UNM - Valencia

Las Maravillas

Pasitos Del Cielo & Habitat

Los Lunas Sports Complex

Valencia

Legend

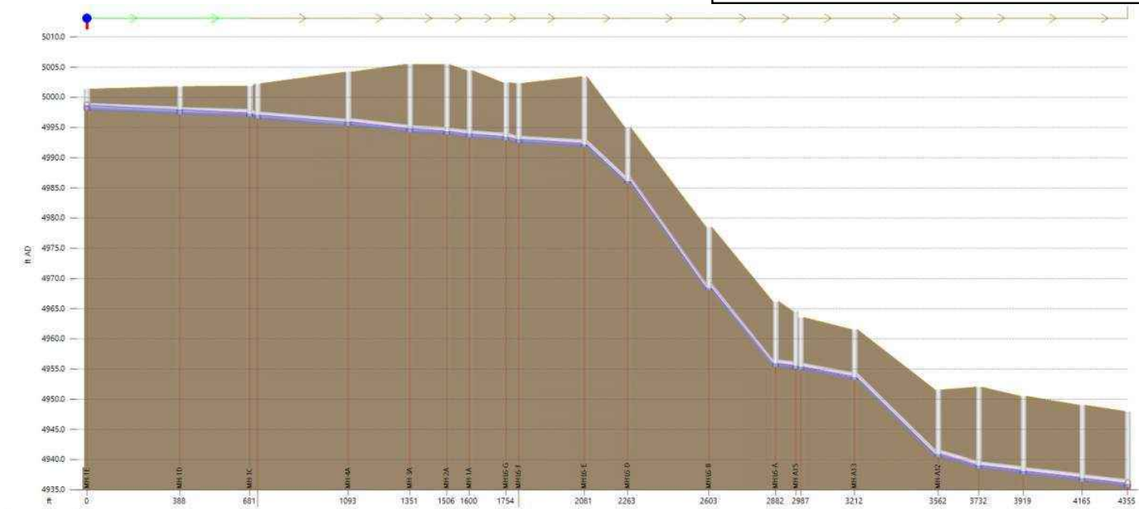
MH Flood Depth (ft)
- Within 3 FT
- Within 1 FT
- Potential SSO

Pipe Max Surcharge (d/D)
- 0 - 0.49
- 0.50 - 0.74
- 0.75 - 0.84
- 0.85 - 0.99
- 1
- 2

N

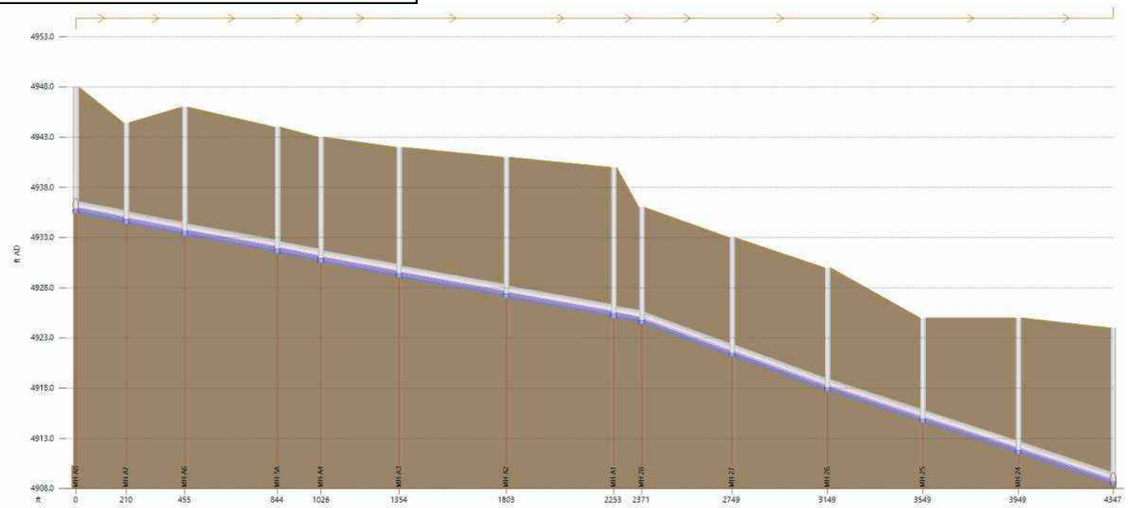
0 1,500 3,000 6,000 Feet

New Mexico Water - Rio Del Oro Sewer System
Near-Term (NT) 2030 - Average Day Max Month (ADMM)
Existing 15" Trunkline Pipe Profiles



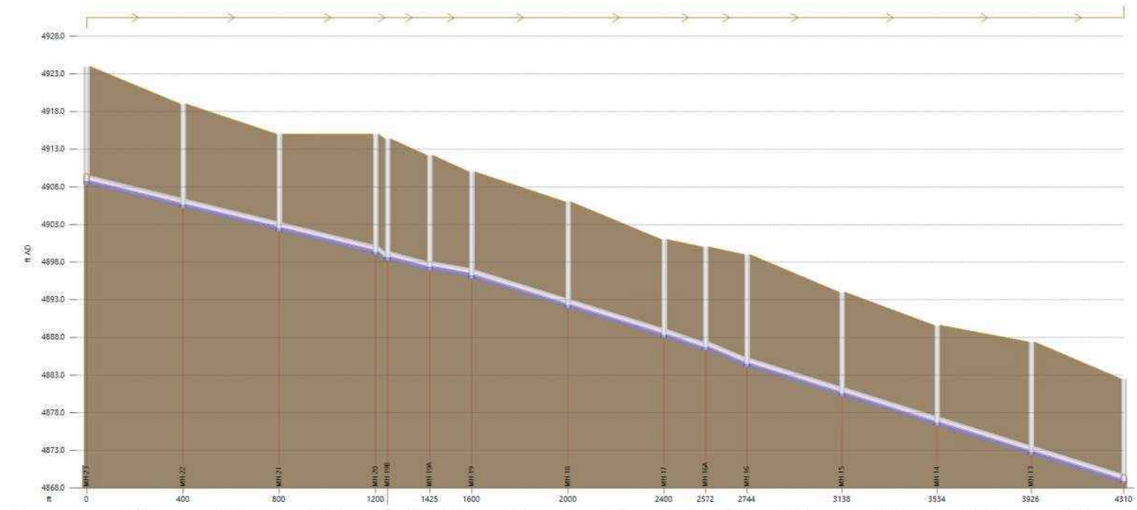
Link	MH-1E.1	MH-1D.1	MH-1C.1	MH-1B.1	MH-4A.1	MH-3A.1	-	MH-1A.1	-	MH L6-F.1	MH L6-E.1	MH L6-D.1	MH L6-B.1	-	MH-A14.1	MH-A13.1	MH-A12.1	MH-A11.1	MH-A10.1	MH-A9.1
width (in)	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.149	0.113	-	0.309	0.415	0.194	0.382	0.228	-	0.197	3.215	5.169	4.499	-	0.667	3.629	1.012	0.402	0.402	0.400
ds inv (ft AD)	4997.310	4996.880	-	4995.290	4994.310	4993.910	-	4993.000	-	4991.910	4985.970	4968.170	4955.510	-	4953.340	4940.540	4938.720	4937.770	4936.580	4935.620
surc	0.56	0.55	-	0.45	0.38	0.44	0.37	0.42	-	0.43	0.23	0.21	0.29	0.37	0.32	0.23	0.30	0.36	0.36	0.36
DS flow (MGD)	0.9163	0.8308	-	0.7626	0.7853	0.7661	-	0.7473	-	0.7092	0.7277	0.7233	0.7186	-	0.7319	0.7244	0.7246	0.7160	0.7054	0.6982
DS velocity (ft/s)	3.008	3.235	-	2.212	3.110	5.150	3.135	3.124	-	3.078	5.215	5.955	3.739	-	3.363	5.391	3.653	3.074	3.060	3.051
Node	MH-1E	MH-1D	MH-1C	MH-1B	MH-4A	MH-3A	-	-	-	MH L6-F	MH L6-E	MH L6-D	MH L6-B	MH L6-A	-	MH-A13	MH-A12	MH-A11	MH-A10	MH-A9	-

Section 1



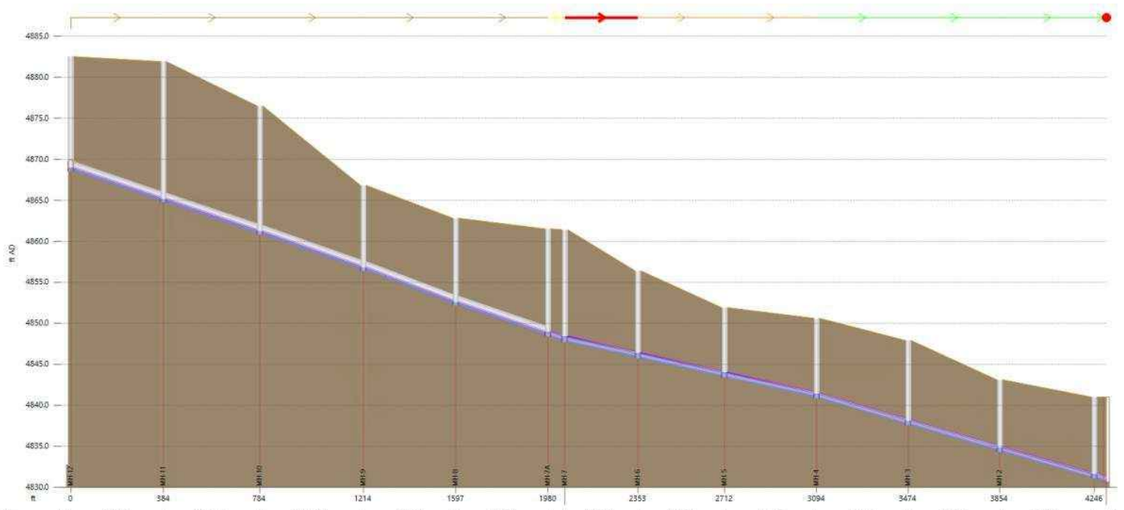
Link	MH-A8.1	MH-A7.1	MH-A6.1	MH-5A.1	MH-A4.1	MH-A3.1	MH-A2.1	-	MH-28.1	MH-27.1	MH-26.1	MH-25.1	MH-24.1
width (in)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.400	0.400	0.401	0.400	0.399	0.401	0.400	0.348	0.809	0.810	0.730	0.727	0.736
ds inv (ft AD)	4934.580	4933.400	4931.640	4930.710	4929.200	4927.200	4925.200	-	4921.330	4917.890	4914.770	4911.660	4908.530
surc	0.35	0.35	0.35	0.35	0.35	0.34	0.34	0.35	0.28	0.28	0.29	0.29	0.29
DS flow (MGD)	0.6905	0.6818	0.6701	0.6648	0.6548	0.6439	0.6352	0.6337	0.6287	0.6259	0.6206	0.6179	0.6133
DS velocity (ft/s)	3.040	3.029	3.013	3.006	2.992	2.977	2.964	2.965	3.436	3.433	3.302	3.294	3.300
Node	-	MH-A7	MH-A6	MH-5A	MH-A4	MH-A3	MH-A2	MH-A1	MH-28	MH-27	MH-26	MH-25	MH-24	MH-23

Section 2



Link	MH-23.1	MH-22.1	MH-21.1	-	MH-19B.1	MH-19A.1	MH-19.1	MH-18.1	MH-17.1	MH-16A.1	MH-16.1	MH-15.1	MH-14.1	MH-13.1
width (in)	15.0	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.733	0.730	0.730	-	0.732	0.520	0.940	0.940	0.941	1.168	0.941	0.940	0.940	0.941
ds inv (ft AD)	4905.400	4902.280	4899.160	-	4896.950	4896.040	4892.080	4888.120	4886.300	4864.290	4860.380	4876.460	4872.580	4868.760
surc	0.28	0.28	0.29	-	0.31	0.31	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27
DS flow (MGD)	0.6109	0.6069	0.6233	-	0.6214	0.6194	0.6176	0.6149	0.6145	0.6131	0.6118	0.6098	0.6078	0.6238
DS velocity (ft/s)	3.291	3.280	3.307	-	2.937	2.935	3.599	3.594	3.592	3.592	3.590	3.585	3.580	3.612
Node	MH-23	MH-22	MH-21	MH-20	-	MH-19A	MH-19	MH-18	MH-17	MH-16A	MH-16	MH-15	MH-14	MH-13	MH-12

Section 3



Link	MH-12.1	MH-11.1	MH-10.1	MH-9.1	MH-8.1	-	MH-7.1	MH-6.1	MH-5.1	MH-4.1	MH-3.1	MH-2.1	-
width (in)	15.0	15.0	15.0	15.0	15.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	-
grad (%)	0.941	0.935	0.979	1.050	0.940	-	0.594	0.600	0.602	0.808	0.808	0.791	-
ds inv (ft AD)	4864.950	4861.010	4856.600	4852.380	4848.580	-	4845.900	4843.540	4841.040	4837.770	4834.500	4831.200	-
surc	0.27	0.27	0.27	0.28	0.27	-	2.00	0.97	0.95	0.72	0.72	0.72	-
DS flow (MGD)	0.6223	0.6203	0.6194	0.6181	0.6165	-	0.6053	0.5970	0.5944	0.5941	0.5938	0.5936	-
DS velocity (ft/s)	3.609	3.597	3.653	3.485	3.597	-	3.614	3.591	3.584	3.577	3.576	3.576	-
Node	MH-12	MH-11	MH-10	MH-9	MH-8	MH-7A	MH-7	MH-6	MH-5	MH-4	MH-3	MH-2	MH-1

Section 4

New Mexico Water - Rio Del Oro Sewer System
Near-Term (NT) 2030 - Peak Daily Flow (PDF) Results

Eastland Hills

Eastland Hills LS

Red junctions along EHLS forcemain are "break" nodes in model (which are necessary model elements along a pressure pipeline, not regular manholes), and are not experiencing an sewer spill during simulation.

Manzerro Plaza

Tome Vista

EHLS forcemain discharge manhole

Break nodes along Manzerro forcemain; not spilling

Manzerro LS

Desert View Elementary

Valencia High School

Tome Elementary

Valencia Middle School

UNM - Valencia

Las Maravillas

Pasitos Del Cielo & Habitat

Los Lunas Sports Complex

Valencia

Legend

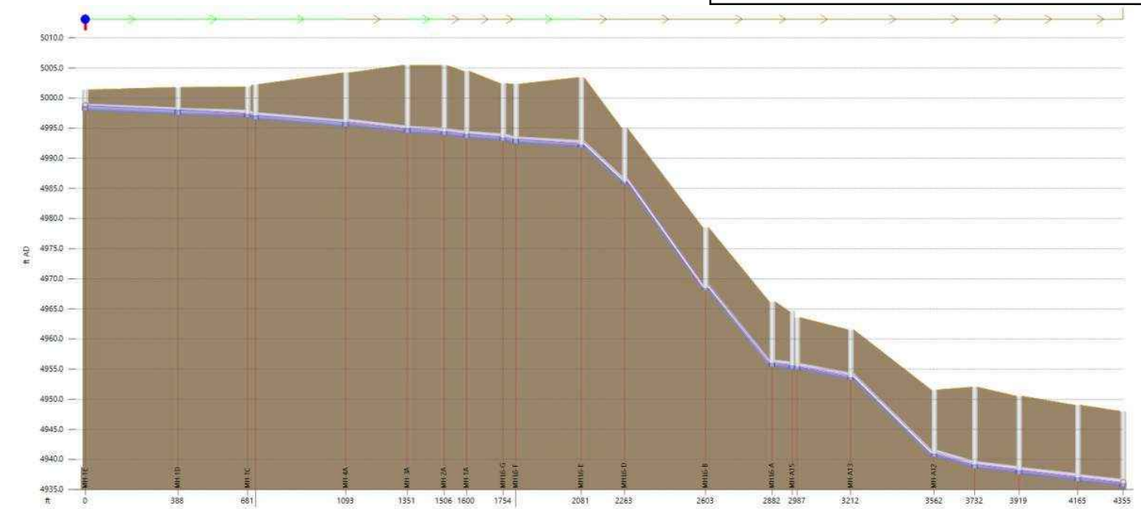
MH Flood Depth (ft)
- Within 3 FT
- Within 1 FT
- Potential SSO

Pipe Max Surcharge (d/D)
- 0 - 0.49
- 0.50 - 0.74
- 0.75 - 0.84
- 0.85 - 0.99
- 1
- 2

N

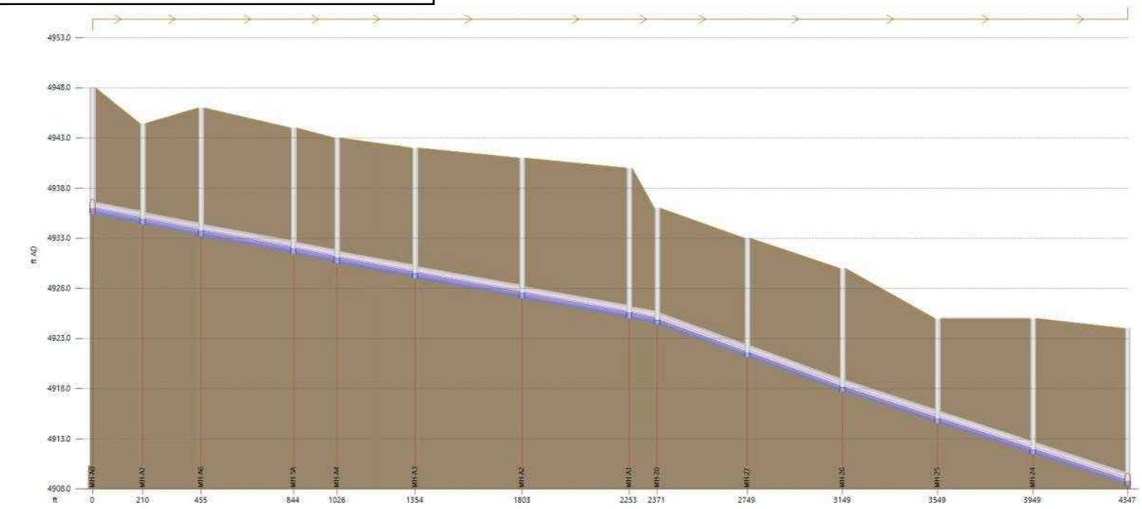
0 1,500 3,000 6,000 Feet

New Mexico Water - Rio Del Oro Sewer System
Near-Term (NT) 2030 - Peak Daily Flow (PDF)
Existing 15" Trunkline Pipe Profiles



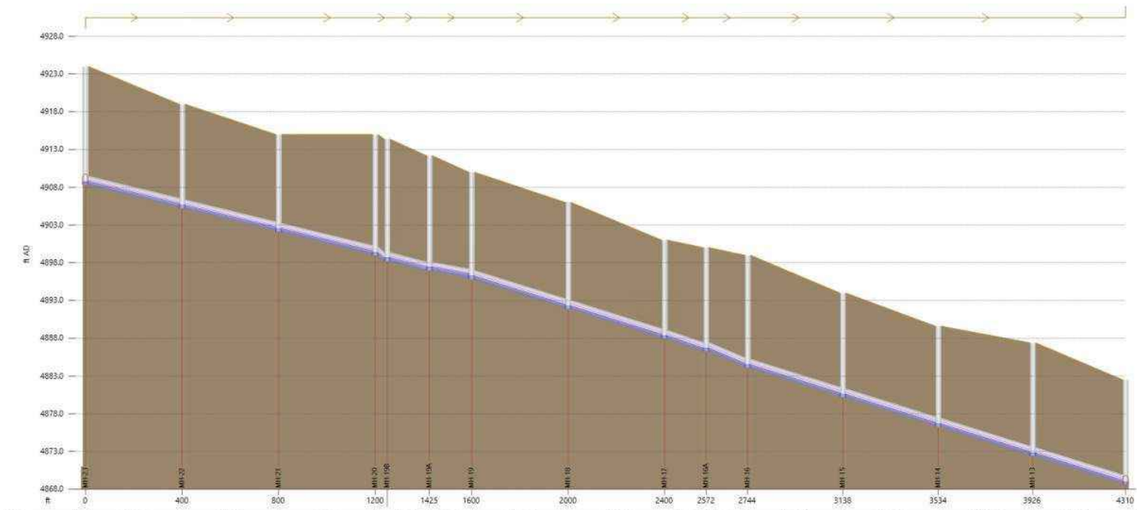
Link	MH-1E.1	MH-1D.1	-	MH-1B.1	MH-4A.1	MH-3A.1	-	MH-1A.1	-	MH-L6-F.1	MH-L6-E.1	MH-L6-D.1	MH-L6-B.1	-	MH-A14.1	MH-A13.1	MH-A12.1	MH-A11.1	MH-A10.1	MH-A9.1
width (in)	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.149	0.113	-	0.309	0.415	0.194	0.352	0.228	-	0.197	3.215	5.169	4.489	-	0.667	3.629	1.012	0.402	0.402	0.400
ds inv (ft AD)	4997.310	4996.880	-	4995.290	4994.310	4993.910	-	4993.000	-	4991.910	4985.970	4968.170	4955.510	-	4953.340	4940.540	4938.720	4937.770	4936.580	4935.620
surc	0.60	0.61	-	0.51	0.44	0.52	0.44	0.50	-	0.52	0.27	0.24	0.37	0.45	0.38	0.27	0.35	0.43	0.43	0.43
DS flow (MGD)	1.0732	1.0382	-	0.9883	1.0436	1.0336	-	1.0109	-	0.9826	1.0107	1.0077	1.0032	-	1.0292	1.0275	1.0229	1.0125	1.0029	0.9981
DS velocity (ft/s)	3.008	3.463	-	2.431	3.173	3.453	3.331	3.427	-	3.399	5.945	6.856	3.824	-	3.716	5.895	4.117	3.421	3.411	3.405
Node	MH-1E	MH-1D	MH-1C	MH-1B	MH-4A	MH-3A	-	-	-	MH-L6-F	MH-L6-E	MH-L6-D	MH-L6-B	MH-L6-A	-	MH-A13	MH-A12	MH-A11	MH-A10	MH-A9	-

Section 1



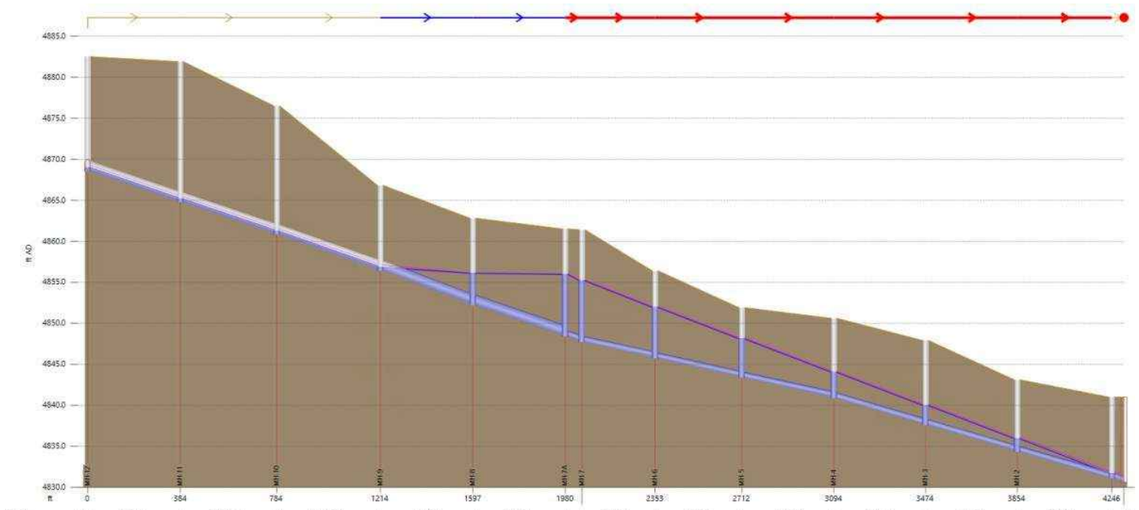
Link	MH-A8.1	MH-A7.1	MH-A6.1	MH-5A.1	MH-A4.1	MH-A3.1	MH-A2.1	-	MH-28.1	MH-27.1	MH-26.1	MH-25.1	MH-24.1
width (in)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.400	0.400	0.401	0.400	0.399	0.401	0.400	0.348	0.809	0.810	0.730	0.727	0.736
ds inv (ft AD)	4934.580	4933.400	4931.640	4930.710	4929.200	4927.200	4925.200	-	4921.330	4917.890	4914.770	4911.660	4908.530
surc	0.43	0.43	0.42	0.42	0.42	0.42	0.42	0.43	0.34	0.34	0.35	0.35	0.35
DS flow (MGD)	0.9914	0.9831	0.9706	0.9638	0.9570	0.9454	0.9348	0.9339	0.9291	0.9245	0.9214	0.9171	0.9129
DS velocity (ft/s)	3.398	3.389	3.376	3.368	3.361	3.348	3.337	3.338	3.864	3.860	3.717	3.707	3.718
Node	-	MH-A7	MH-A6	MH-5A	MH-A4	MH-A3	MH-A2	MH-A1	MH-28	MH-27	MH-26	MH-25	MH-24	MH-23

Section 2



Link	MH-23.1	MH-22.1	MH-21.1	-	MH-19B.1	MH-19A.1	MH-19.1	MH-18.1	MH-17.1	MH-16A.1	MH-16.1	MH-15.1	MH-14.1	MH-13.1
width (in)	15.0	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.733	0.730	0.730	-	0.732	0.520	0.940	0.940	0.941	1.168	0.941	0.940	0.940	0.941
ds inv (ft AD)	4905.400	4902.280	4899.160	-	4896.950	4896.040	4892.080	4888.120	4886.300	4884.290	4880.380	4876.460	4872.580	4868.760
surc	0.35	0.35	0.35	-	0.38	0.38	0.33	0.33	0.33	0.32	0.33	0.33	0.33	0.33
DS flow (MGD)	0.9104	0.9068	0.9309	-	0.9294	0.9283	0.9259	0.9234	0.9231	0.9217	0.9199	0.9186	0.9170	0.9401
DS velocity (ft/s)	3.708	3.700	3.728	-	3.305	3.324	4.070	4.066	4.068	4.166	4.064	4.060	4.057	4.090
Node	MH-23	MH-22	MH-21	MH-20	-	MH-19A	MH-19	MH-18	MH-17	MH-16A	MH-16	MH-15	MH-14	MH-13	MH-12

Section 3



Link	MH-12.1	MH-11.1	MH-10.1	MH-9.1	MH-8.1	-	MH-7.1	MH-6.1	MH-5.1	MH-4.1	MH-3.1	MH-2.1	-
width (in)	15.0	15.0	15.0	15.0	15.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	-
grad (%)	0.941	0.935	0.979	1.050	0.940	-	0.594	0.600	0.602	0.808	0.808	0.791	-
ds inv (ft AD)	4864.950	4861.010	4856.600	4852.380	4848.580	-	4845.900	4843.540	4841.040	4837.770	4834.500	4831.200	-
surc	0.33	0.33	0.33	1.00	1.00	-	2.00	2.00	2.00	2.00	2.00	2.00	-
DS flow (MGD)	0.9386	0.9368	0.9356	0.9279	0.8209	-	0.8021	0.7943	0.7924	0.7909	0.7903	0.7903	-
DS velocity (ft/s)	4.088	4.076	4.141	4.032	3.607	-	3.633	3.623	3.694	3.864	3.864	4.124	-
Node	MH-12	MH-11	MH-10	MH-9	MH-8	MH-7A	MH-7	MH-6	MH-5	MH-4	MH-3	MH-2	MH-1

Section 4

New Mexico Water - Rio Del Oro Sewer System
Near-Term (NT) 2030 - Peak Hourly Flow (PHF) Results

Eastland Hills

Eastland Hills LS

Red junctions along EHLS forcemain are "break" nodes in model (which are necessary model elements along a pressure pipeline, not regular manholes), and are not experiencing an sewer spill during simulation.

Manzerro Plaza

Tome Vista

EHLS forcemain discharge manhole

Break nodes along Manzerro forcemain; not spilling

Manzerro LS

Desert View Elementary

Valencia High School

Tome Elementary

Valencia Middle School

UNM - Valencia

Las Maravillas

Pasitos Del Cielo & Habitat

Los Lunas Sports Complex

Valencia

Legend

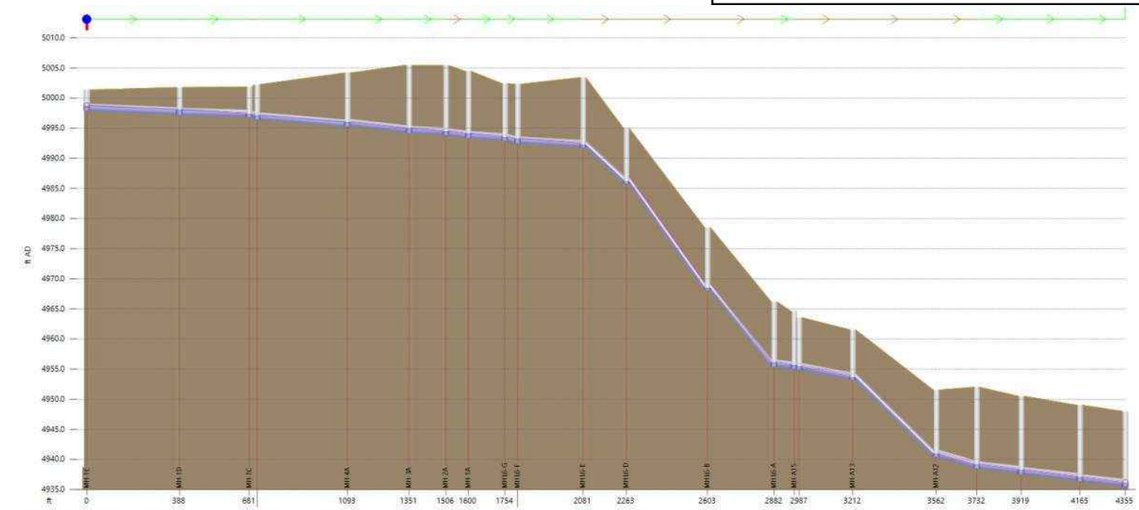
MH Flood Depth (ft)
- Within 3 FT
- Within 1 FT
- Potential SSO

Pipe Max Surcharge (d/D)
- 0 - 0.49
- 0.50 - 0.74
- 0.75 - 0.84
- 0.85 - 0.99
- 1
- 2

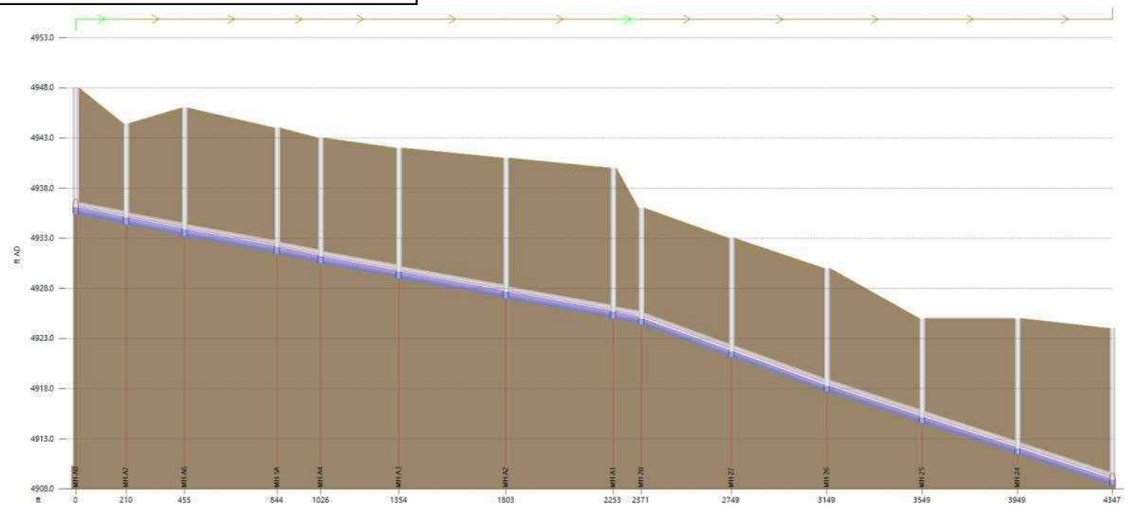
N

0 1,500 3,000 6,000 Feet

New Mexico Water - Rio Del Oro Sewer System
Near-Term (NT) 2030 - Peak Hourly Flow (PHF)
Existing 15" Trunkline Pipe Profiles



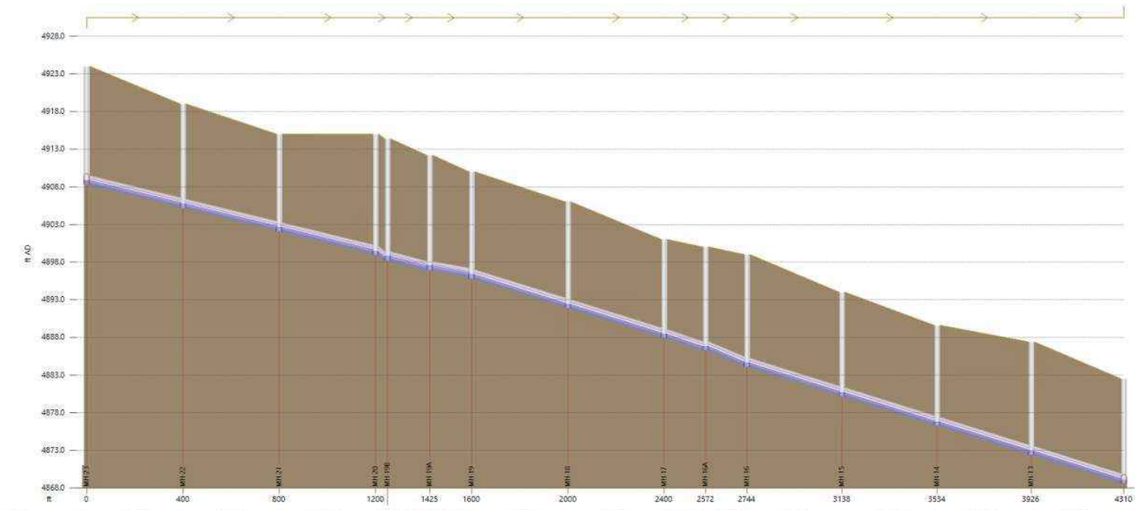
Link	MH-1E-1	MH-1D-1	-	MH-1B-1	MH-4A-1	MH-3A-1	-	MH-1A-1	-	MH-L6-F-1	MH-L6-E-1	MH-L6-D-1	MH-L6-B-1	-	MH-A14-1	MH-A13-1	MH-A12-1	MH-A11-1	MH-A10-1	MH-A9-1
width (in)	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.149	0.113	-	0.309	0.415	0.194	0.382	0.228	-	0.197	3.215	5.169	4.489	-	0.667	3.629	1.012	0.402	0.402	0.400
ds inv (ft AD)	4997.310	4996.880	-	4995.290	4994.310	4993.910	-	4993.000	-	4991.910	4985.970	4968.170	4955.510	-	4953.340	4940.540	4938.720	4937.770	4936.580	4935.620
surc	0.64	0.66	-	0.56	0.50	0.58	0.50	0.56	-	0.60	0.30	0.27	0.43	0.51	0.44	0.32	0.40	0.50	0.50	0.50
DS flow (MGD)	1.1861	1.1841	-	1.1765	1.2710	1.2665	-	1.2604	-	1.2483	1.2896	1.2863	1.2859	-	1.3316	1.3274	1.3275	1.3220	1.3156	1.3133
DS velocity (ft/s)	3.008	3.609	-	2.573	3.203	3.682	3.362	3.675	-	3.665	6.508	7.548	3.908	-	3.993	6.065	4.481	3.726	3.720	3.718
Node	MH-1E	MH-1D	MH-1C	MH-1B	MH-4A	MH-3A	-	-	-	MH-L6-F	MH-L6-E	MH-L6-D	MH-L6-B	MH-L6-A	-	MH-A13	MH-A12	MH-A11	MH-A10	MH-A9	-



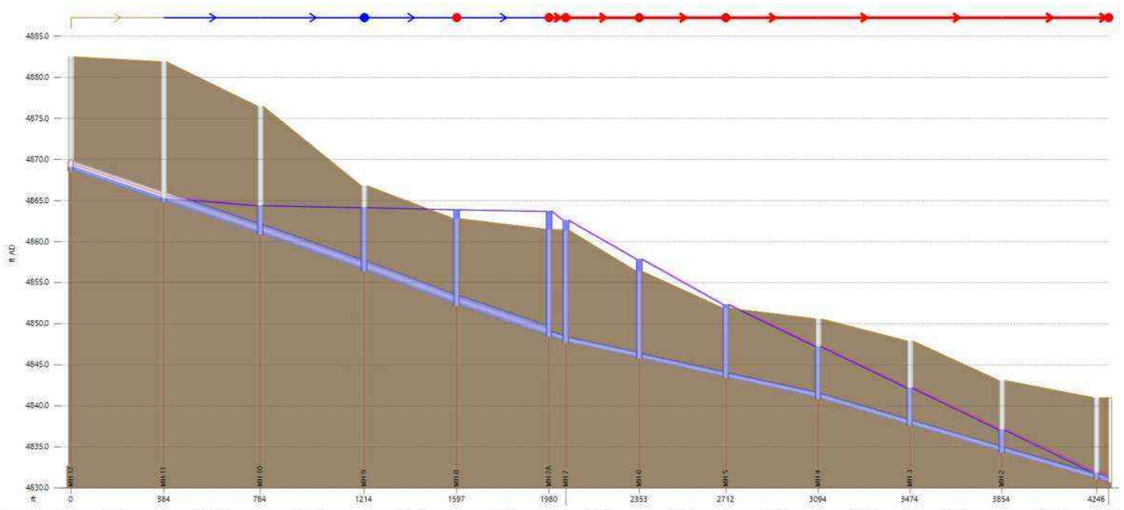
Link	MH-A8.1	MH-A7.1	MH-A6.1	MH-5A.1	MH-A4.1	MH-A3.1	MH-A2.1	-	MH-28.1	MH-27.1	MH-26.1	MH-25.1	MH-24.1
width (in)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.400	0.400	0.401	0.400	0.399	0.401	0.400	0.348	0.809	0.810	0.730	0.727	0.736
ds inv (ft AD)	4934.580	4933.400	4931.640	4930.710	4929.200	4927.200	4925.200	-	4921.330	4917.890	4914.770	4911.660	4908.530
surc	0.50	0.50	0.50	0.50	0.50	0.49	0.49	0.50	0.40	0.40	0.41	0.41	0.41
DS flow (MGD)	1.3090	1.3034	1.2932	1.2908	1.2826	1.2736	1.2636	1.2619	1.2573	1.2520	1.2489	1.2451	1.2407
DS velocity (ft/s)	3.714	3.708	3.699	3.697	3.689	3.681	3.671	3.671	4.215	4.211	4.054	4.045	4.059
Node	-	MH-A7	MH-A6	MH-5A	MH-A4	MH-A3	MH-A2	MH-A1	MH-28	MH-27	MH-26	MH-25	MH-24	MH-23

Section 1

Section 2



Link	MH-23-1	MH-22-1	MH-21-1	-	MH-19B-1	MH-19A-1	MH-19-1	MH-18-1	MH-17-1	MH-16A-1	MH-16-1	MH-15-1	MH-14-1	MH-13-1
width (in)	15.0	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.733	0.730	0.730	-	0.732	0.520	0.940	0.940	0.941	1.168	0.941	0.940	0.940	0.941
ds inv (ft AD)	4905.400	4902.280	4899.160	-	4896.950	4896.040	4892.080	4888.120	4886.300	4864.290	4860.380	4876.460	4872.580	4868.760
surc	0.41	0.41	0.41	-	0.45	0.45	0.39	0.38	0.38	0.37	0.38	0.38	0.38	0.39
DS flow (MGD)	1.2355	1.2325	1.2575	-	1.2543	1.2525	1.2491	1.2459	1.2459	1.2435	1.2412	1.2391	1.2368	1.2605
DS velocity (ft/s)	4.047	4.039	4.062	-	3.592	3.657	4.439	4.436	4.438	4.607	4.433	4.429	4.426	4.453
Node	MH-23	MH-22	MH-21	MH-20	-	MH-19A	MH-19	MH-18	MH-17	MH-16A	MH-16	MH-15	MH-14	MH-13	MH-12



Link	MH-12-1	MH-11-1	MH-10-1	MH-9-1	MH-8-1	-	MH-7-1	MH-6-1	MH-5-1	MH-4-1	MH-3-1	MH-2-1	-
width (in)	15.0	15.0	15.0	15.0	15.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	-
grad (%)	0.941	0.855	0.879	1.050	0.940	-	0.594	0.600	0.602	0.808	0.808	0.791	-
ds inv (ft AD)	4864.950	4861.010	4856.600	4852.380	4848.580	-	4845.900	4843.540	4841.040	4837.770	4834.500	4831.200	-
surc	0.39	1.00	1.00	1.00	1.00	-	2.00	2.00	2.00	2.00	2.00	2.00	-
DS flow (MGD)	1.2587	1.2567	1.2493	1.0821	0.9763	-	0.9628	0.9609	0.8928	0.8863	0.8862	0.8862	-
DS velocity (ft/s)	4.451	4.439	4.505	4.227	3.610	-	3.643	3.625	3.904	3.904	3.871	4.300	-
Node	MH-12	MH-11	MH-10	MH-9	MH-8	MH-7A	MH-7	MH-6	MH-5	MH-4	MH-3	MH-2	MH-1

Section 3

Section 4

ATTACHMENT 4

New Mexico Water - Rio Del Oro Sewer System
Buildout (BO) 2050 - Annual Average Day (AAD)

Eastland Hills

Eastland Hills LS

Red junctions along EHLS forcemain are "break" nodes in model (which are necessary model elements along a pressure pipeline, not regular manholes), and are not experiencing an sewer spill during simulation.

Manzerro Plaza

Tome Vista

EHLS forcemain discharge manhole

Break nodes along Manzerro forcemain; not spilling

Manzerro LS

Sierra Madre

Future Meyers Group

Desert View Elementary

Valencia High School

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Las Maravillas

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Valencia

Legend

MH Flood Depth (ft)
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- Potential SSO

Pipe Max Surcharge (d/D)
- 0 - 0.49
- 0.50 - 0.74
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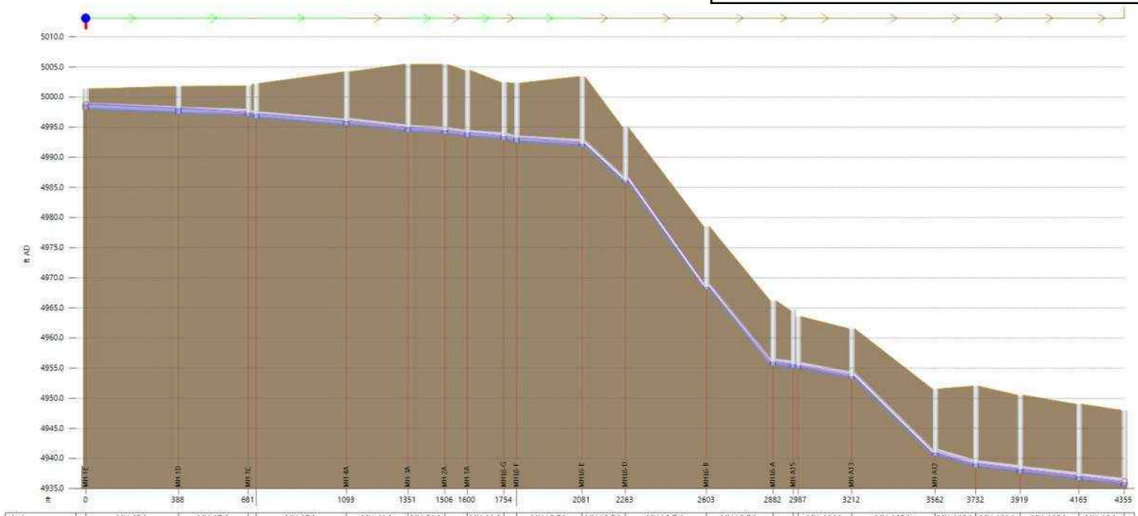
N

0 1,500 3,000 6,000 Feet

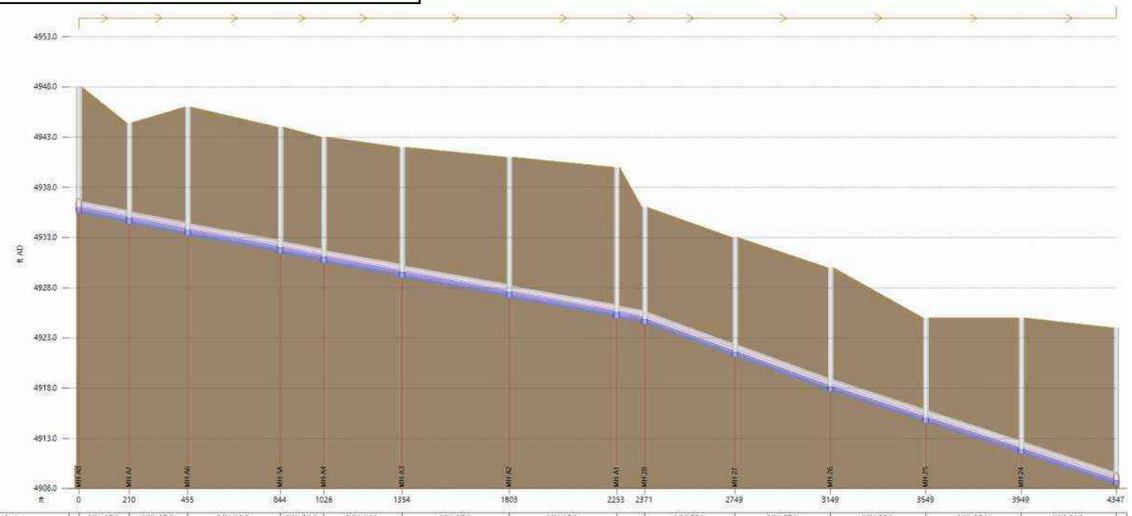
New Mexico Water - Rio Del Oro Sewer System
Buildout (BO) 2050 - Annual Average Day (AAD)
Existing 15" Trunkline Pipe Profiles

Section 1



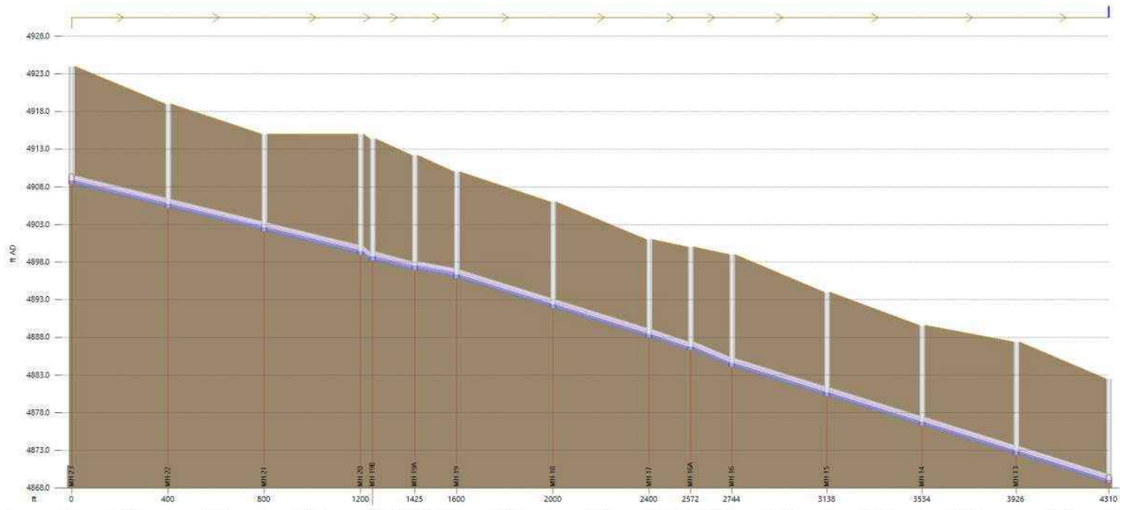
Link	MH-1E-1	MH-1D-1	-	MH-1B-1	MH-4A-1	MH-3A-1	-	MH-1A-1	-	MH-L6-F-1	MH-L6-E-1	MH-L6-D-1	MH-L6-B-1	-	MH-A14-1	MH-A13-1	MH-A12-1	MH-A11-1	MH-A10-1	MH-A9-1
width (in)	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.149	0.113	-	0.309	0.415	0.194	0.382	0.228	-	0.197	3.215	5.169	4.489	-	0.667	3.629	1.012	0.402	0.402	0.400
ds inv (ft AD)	4997.310	4996.880	-	4995.290	4994.310	4993.910	-	4993.000	-	4991.910	4985.970	4968.170	4955.510	-	4953.340	4940.540	4938.720	4937.770	4936.580	4935.620
surc	0.71	0.69	-	0.55	0.48	0.56	0.47	0.53	-	0.56	0.28	0.25	0.39	0.47	0.40	0.29	0.37	0.46	0.45	0.45
DS flow (MGD)	1.3364	1.2576	-	1.1864	1.1889	1.1750	-	1.1489	-	1.1125	1.1276	1.1199	1.1201	-	1.1250	1.1228	1.1150	1.1102	1.1003	1.0941
DS velocity (ft/s)	2.806	3.679	-	2.684	3.229	3.595	3.373	3.568	-	3.533	6.195	7.152	3.942	-	3.810	5.955	4.236	3.522	3.512	3.506
Node	MH-1E	MH-1D	MH-1C	MH-1B	MH-4A	MH-3A	-	-	-	MH-L6-F	MH-L6-E	MH-L6-D	MH-L6-B	MH-L6-A	-	MH-A13	MH-A12	MH-A11	MH-A10	MH-A9	-

Section 2



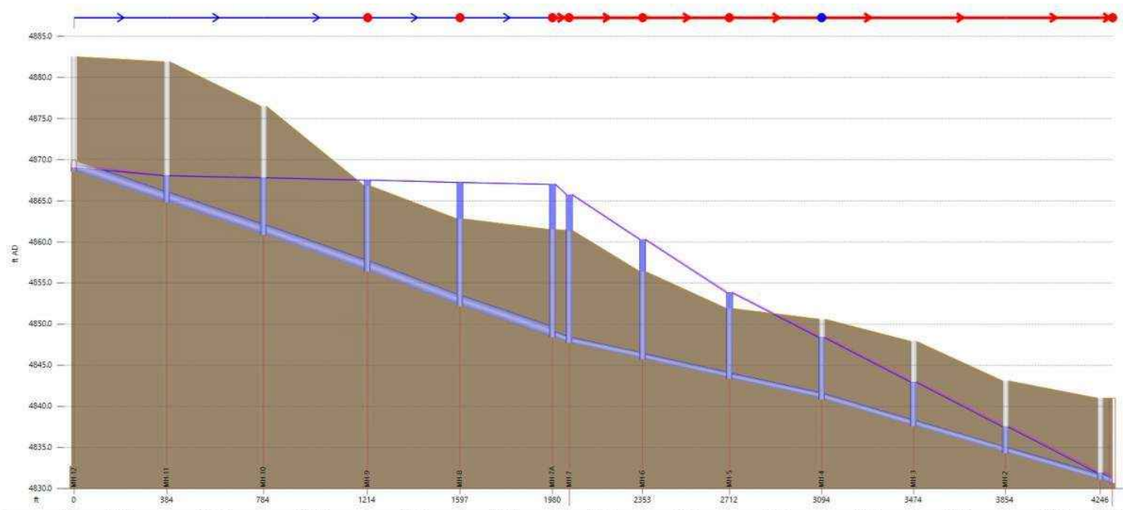
Link	MH-A8.1	MH-A7.1	MH-A6.1	MH-5A.1	MH-A4.1	MH-A3.1	MH-A2.1	-	MH-28.1	MH-27.1	MH-26.1	MH-25.1	MH-24.1
width (in)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.400	0.400	0.401	0.400	0.399	0.401	0.400	0.348	0.809	0.810	0.730	0.727	0.736
ds inv (ft AD)	4934.580	4933.400	4931.640	4930.710	4929.200	4927.200	4925.200	-	4921.330	4917.890	4914.770	4911.660	4908.530
surc	0.45	0.45	0.45	0.44	0.44	0.44	0.44	0.45	0.36	0.36	0.37	0.37	0.37
DS flow (MGD)	1.0866	1.0785	1.0640	1.0611	1.0510	1.0405	1.0315	1.0290	1.0253	1.0209	1.0152	1.0125	1.0086
DS velocity (ft/s)	3.498	3.490	3.475	3.472	3.461	3.450	3.441	3.440	3.976	3.973	3.823	3.815	3.827
Node	-	MH-A7	MH-A6	MH-5A	MH-A4	MH-A3	MH-A2	MH-A1	MH-28	MH-27	MH-26	MH-25	MH-24	MH-23

Section 3



Link	MH-23-1	MH-22-1	MH-21-1	-	MH-19B-1	MH-19A-1	MH-19-1	MH-18-1	MH-17-1	MH-16A-1	MH-16-1	MH-15-1	MH-14-1	MH-13-1
width (in)	15.0	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.733	0.730	0.730	-	0.732	0.520	0.940	0.940	0.941	1.168	0.941	0.940	0.940	0.941
ds inv (ft AD)	4905.400	4902.280	4899.160	-	4896.950	4896.040	4892.080	4888.120	4886.300	4864.290	4860.380	4876.460	4872.580	4868.760
surc	0.37	0.37	0.38	-	0.41	0.41	0.35	0.35	0.35	0.34	0.35	0.35	0.35	0.36
DS flow (MGD)	1.0037	1.0011	1.0574	-	1.0550	1.0521	1.0503	1.0482	1.0466	1.0462	1.0440	1.0417	1.0393	1.0955
DS velocity (ft/s)	3.815	3.807	3.868	-	3.424	3.458	4.223	4.221	4.221	4.351	4.218	4.213	4.210	4.277
Node	MH-23	MH-22	MH-21	MH-20	-	MH-19A	MH-19	MH-18	MH-17	MH-16A	MH-16	MH-15	MH-14	MH-13	MH-12

Section 4



Link	MH-12.1	MH-11.1	MH-10.1	MH-9.1	MH-8.1	-	MH-7.1	MH-6.1	MH-5.1	MH-4.1	MH-3.1	MH-2.1	-
width (in)	15.0	15.0	15.0	15.0	15.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	-
grad (%)	0.941	0.935	0.979	1.050	0.940	-	0.594	0.600	0.602	0.808	0.808	0.791	-
ds inv (ft AD)	4864.950	4861.010	4856.600	4852.380	4848.580	-	4845.900	4843.540	4841.040	4837.770	4834.500	4831.200	-
surc	1.00	1.00	1.00	1.00	1.00	-	2.00	2.00	2.00	2.00	2.00	2.00	-
DS flow (MGD)	1.0613	1.0547	1.0480	1.0423	1.0373	-	1.0333	1.0328	0.9171	0.9171	0.9171	0.9171	-
DS velocity (ft/s)	1.256	1.165	1.078	1.006	0.949	-	2.962	3.294	3.154	3.369	3.616	3.957	-
Node	MH-12	MH-11	MH-10	MH-9	MH-8	MH-7A	MH-7	MH-6	MH-5	MH-4	MH-3	MH-2	MH-1

New Mexico Water - Rio Del Oro Sewer System
Buildout (BO) 2050 - Average Day Max Month (ADMM) Results

Eastland Hills

Eastland Hills LS

Red junctions along EHLS forcemain are "break" nodes in model (which are necessary model elements along a pressure pipeline, not regular manholes), and are not experiencing an sewer spill during simulation.

Manzerro Plaza

Tome Vista

EHLS forcemain discharge manhole

Break nodes along Manzerro forcemain; not spilling

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Future Meyers Group

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MH Flood Depth (ft)
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Pipe Max Surcharge (d/D)
- 0 - 0.49
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- 0.85 - 0.99
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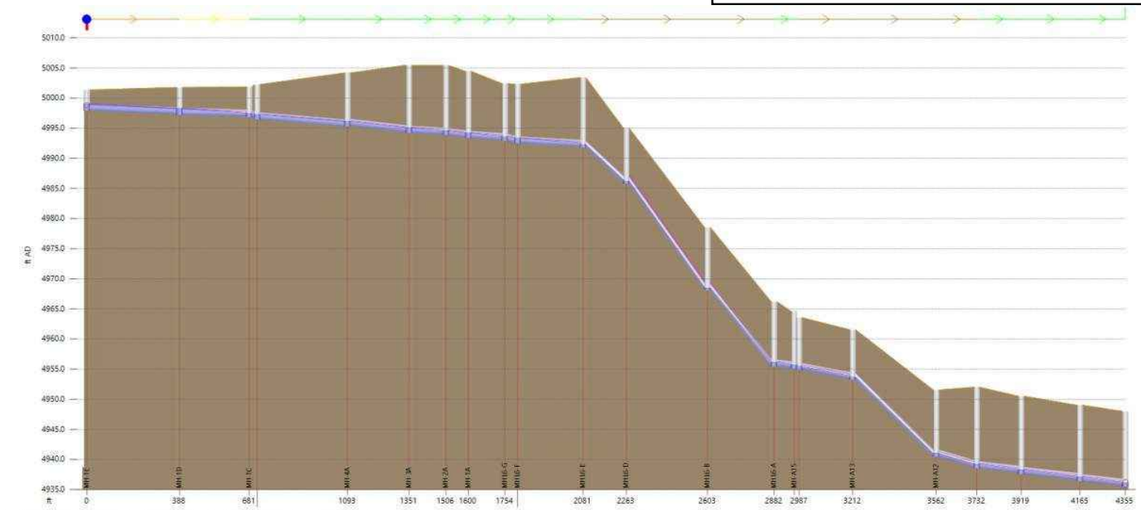
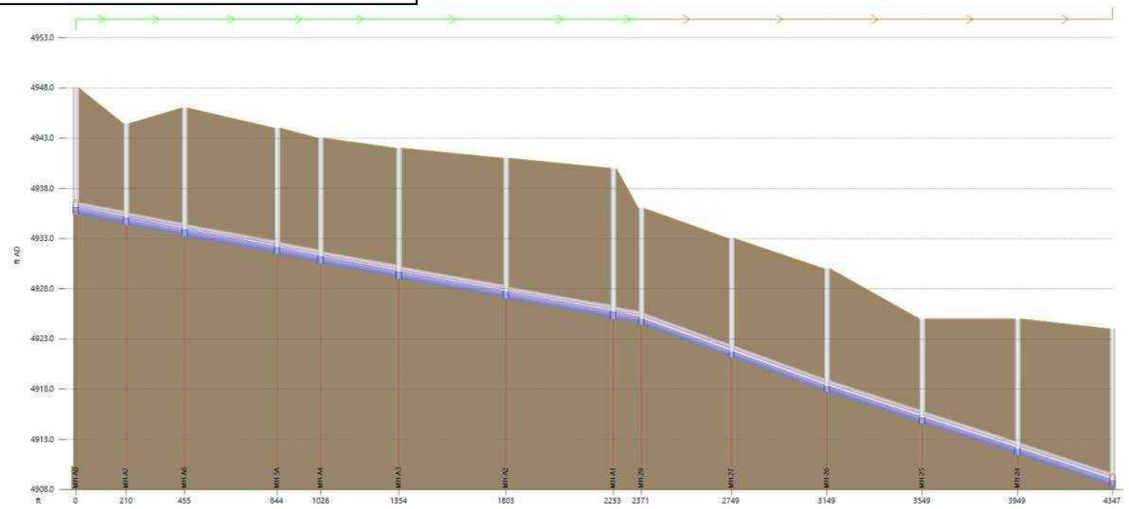
N

0 1,500 3,000 6,000 Feet

New Mexico Water - Rio Del Oro Sewer System
Buildout (BO) 2050 - Peak Monthly Flow (PMF)
Existing 15" Trunkline Pipe Profiles



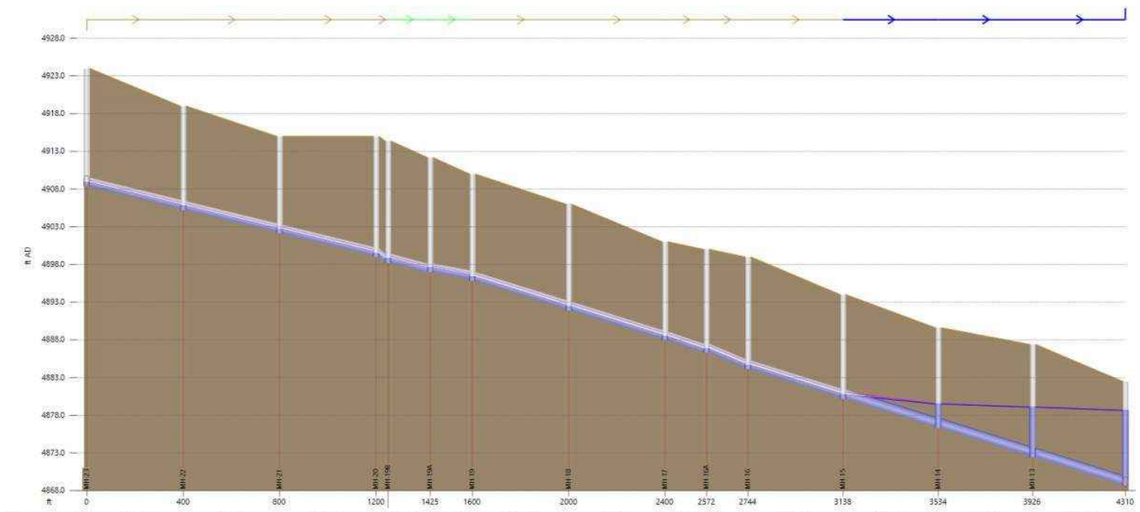
Link	MH-1E-1	MH-1D-1	-	MH-1B-1	MH-4A-1	MH-3A-1	-	MH-1A-1	-	MH L6-F-1	MH L6-E-1	MH L6-D-1	MH L6-B-1	-	MH-A14-1	MH-A13-1	MH-A12-1	MH-A11-1	MH-A10-1	MH-A9-1
width (in)	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.149	0.113	-	0.309	0.415	0.194	0.382	0.228	-	0.197	3.215	5.169	4.489	-	0.667	3.629	1.012	0.402	0.402	0.400
ds inv (ft AD)	4997.310	4996.880	-	4995.290	4994.310	4993.910	-	4993.000	-	4991.910	4985.970	4968.170	4955.510	-	4953.340	4940.540	4938.720	4937.770	4936.580	4935.620
surc	0.86	0.81	-	0.63	0.58	0.66	0.56	0.63	-	0.67	0.32	0.29	0.48	0.56	0.48	0.35	0.43	0.55	0.55	0.54
DS flow (MGD)	1.6713	1.6254	-	1.5513	1.5770	1.5703	-	1.5471	-	1.5106	1.5354	1.5298	1.5277	-	1.5453	1.5373	1.5376	1.5282	1.5175	1.5120
DS velocity (ft/s)	2.825	4.003	-	2.946	3.326	3.953	3.469	3.932	-	3.901	6.922	8.054	4.068	-	4.156	6.175	4.698	3.909	3.900	3.895
Node	MH-1E	MH-1D	MH-1C	MH-1B	MH-4A	MH-3A	-	-	-	MH L6-F	MH L6-E	MH L6-D	MH L6-B	MH L6-A	-	MH-A13	MH-A12	MH-A11	MH-A10	MH-A9	-



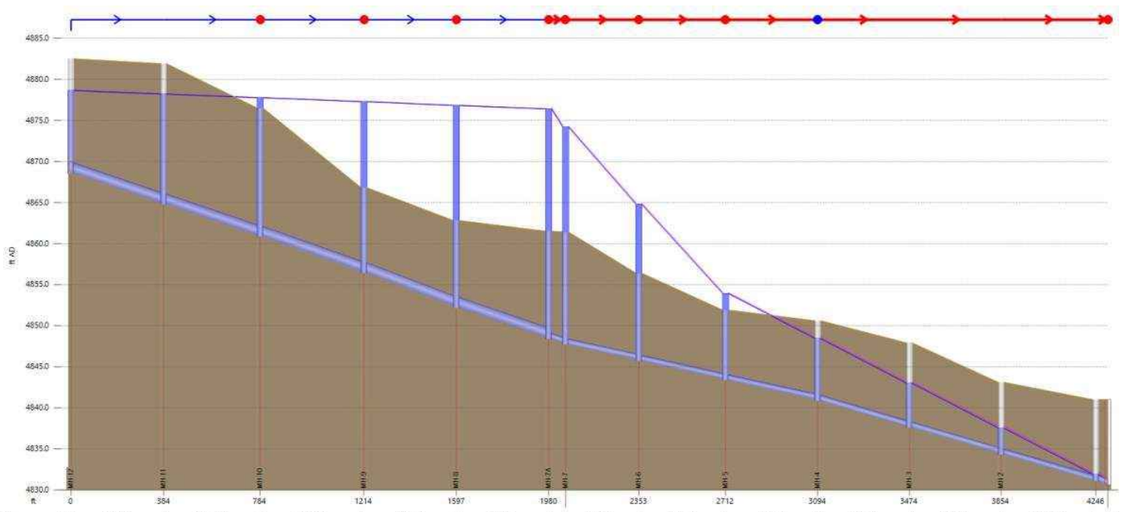
Link	MH-A8.1	MH-A7.1	MH-A6.1	MH-5A.1	MH-A4.1	MH-A3.1	MH-A2.1	-	MH-28.1	MH-27.1	MH-26.1	MH-25.1	MH-24.1
width (in)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.400	0.400	0.401	0.400	0.399	0.401	0.400	0.348	0.809	0.810	0.730	0.727	0.736
ds inv (ft AD)	4934.580	4933.400	4931.640	4930.710	4929.200	4927.200	4925.200	-	4921.330	4917.890	4914.770	4911.660	4908.530
surc	0.54	0.54	0.54	0.54	0.54	0.54	0.53	0.54	0.43	0.43	0.45	0.44	0.44
DS flow (MGD)	1.5060	1.4979	1.4835	1.4806	1.4709	1.4605	1.4492	1.4484	1.4442	1.4397	1.4345	1.4316	1.4284
DS velocity (ft/s)	3.890	3.883	3.871	3.865	3.860	3.850	3.840	3.841	4.380	4.378	4.211	4.204	4.219
Node	-	MH-A7	MH-A6	MH-5A	MH-A4	MH-A3	MH-A2	MH-A1	MH-28	MH-27	MH-26	MH-25	MH-24	MH-23

Section 1

Section 2



Link	MH-23-1	MH-22-1	MH-21-1	-	MH-19B-1	MH-19A-1	MH-19-1	MH-18-1	MH-17-1	MH-16A-1	MH-16-1	MH-15-1	MH-14-1	MH-13-1
width (in)	15.0	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.733	0.730	0.730	-	0.732	0.520	0.940	0.940	0.941	1.168	0.841	0.940	0.940	0.941
ds inv (ft AD)	4905.400	4902.280	4899.160	-	4896.950	4896.040	4892.080	4888.120	4886.300	4884.290	4880.380	4876.460	4872.580	4868.760
surc	0.44	0.44	0.46	-	0.50	0.50	0.43	0.42	0.42	0.41	0.42	1.00	1.00	1.00
DS flow (MGD)	1.4250	1.4213	1.5043	-	1.5030	1.5012	1.4991	1.4971	1.4958	1.4953	1.4935	1.4875	1.3951	1.4343
DS velocity (ft/s)	4.209	4.201	4.266	-	3.767	3.883	4.672	4.671	4.672	4.886	4.670	4.663	4.579	4.464
Node	MH-23	MH-22	MH-21	MH-20	-	MH-19A	MH-19	MH-18	MH-17	MH-16A	MH-16	MH-15	MH-14	MH-13	MH-12



Link	MH-12.1	MH-11.1	MH-10.1	MH-9.1	MH-8.1	-	MH-7.1	MH-6.1	MH-5.1	MH-4.1	MH-3.1	MH-2.1	-
width (in)	15.0	15.0	15.0	15.0	15.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	-
grad (%)	0.941	0.935	0.979	1.050	0.940	-	0.594	0.600	0.602	0.808	0.808	0.791	-
ds inv (ft AD)	4864.950	4861.010	4856.600	4852.380	4848.580	-	4845.900	4843.540	4841.040	4837.770	4834.500	4831.200	-
surc	1.00	1.00	1.00	1.00	1.00	-	2.00	2.00	2.00	2.00	2.00	2.00	-
DS flow (MGD)	1.4138	1.3994	1.3870	1.3759	1.3656	-	1.3613	1.3606	0.9196	0.9195	0.9195	0.9195	-
DS velocity (ft/s)	1.463	1.346	1.239	1.158	1.097	-	3.487	4.326	3.154	3.371	3.621	3.861	-
Node	MH-12	MH-11	MH-10	MH-9	MH-8	MH-7A	MH-7	MH-6	MH-5	MH-4	MH-3	MH-2	MH-1

Section 3

Section 4

New Mexico Water - Rio Del Oro Sewer System
Buildout (BO) 2050 - Peak Daily Flow (PDF) Results

Eastland Hills

Eastland Hills LS

Red junctions along EHLS forcemain are "break" nodes in model (which are necessary model elements along a pressure pipeline, not regular manholes), and are not experiencing an sewer spill during simulation.

Manzerro Plaza

Tome Vista

EHLS forcemain discharge manhole

Break nodes along Manzerro forcemain; not spilling

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Desert View Elementary

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Las Maravillas

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Los Lunas Sports Complex

Valencia

Legend

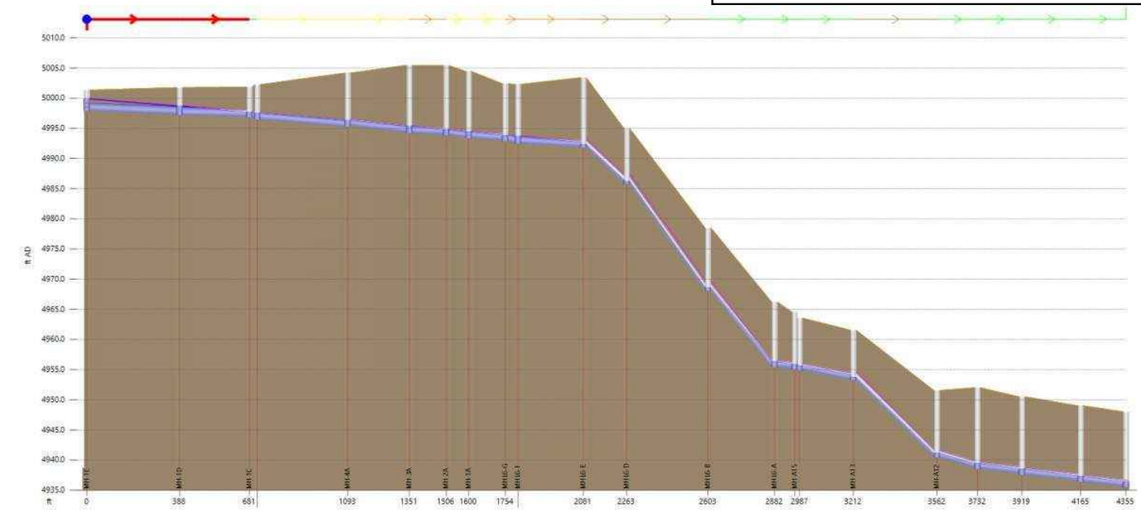
MH Flood Depth (ft)
- Within 3 FT
- Within 1 FT
- Potential SSO

Pipe Max Surcharge (d/D)
- 0 - 0.49
- 0.50 - 0.74
- 0.75 - 0.84
- 0.85 - 0.99
- 1
- 2

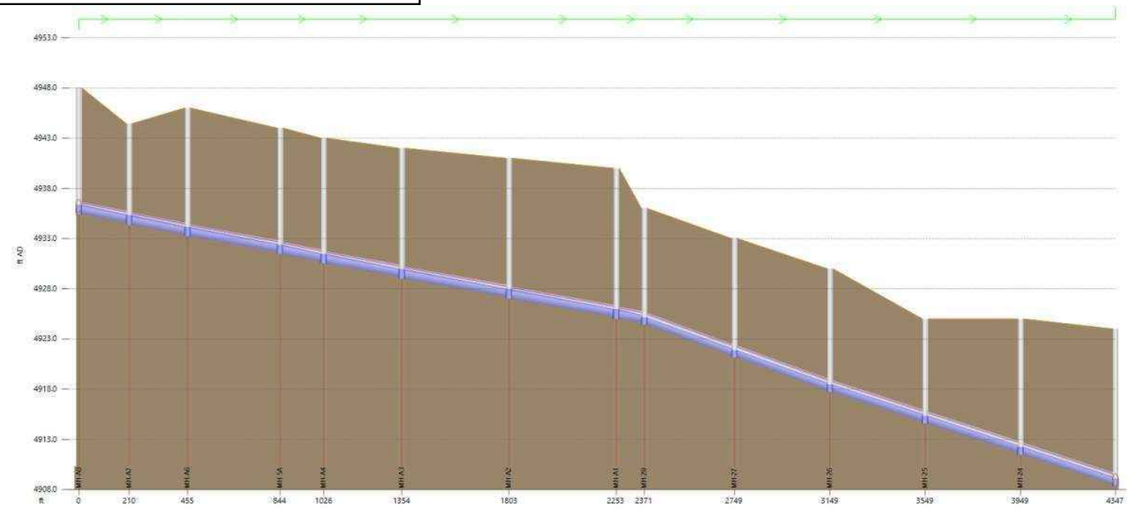
N

0 1,500 3,000 6,000 Feet

New Mexico Water - Rio Del Oro Sewer System
Buildout (BO) 2050 - Peak Daily Flow (PDF)
Existing 15" Trunkline Pipe Profiles



Link	MH-1E.1	MH-1D.1	-	MH-1B.1	MH-4A.1	MH-3A.1	-	MH-1A.1	-	MH L6-F.1	MH L6-E.1	MH L6-D.1	MH L6-B.1	-	MH-A14.1	MH-A13.1	MH-A12.1	MH-A11.1	MH-A10.1	MH-A9.1
width (in)	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.149	0.113	-	0.309	0.415	0.194	0.382	0.228	-	0.197	3.215	5.169	4.489	-	0.667	3.629	1.012	0.402	0.402	0.400
ds inv (ft AD)	4997.310	4996.880	-	4995.290	4994.310	4993.910	-	4993.000	-	4991.910	4985.970	4968.170	4955.510	-	4953.340	4940.540	4938.720	4937.770	4936.580	4935.620
surc	2.00	2.00	-	0.81	0.82	0.86	0.76	0.83	-	0.94	0.39	0.35	0.63	0.71	0.60	0.46	0.56	0.71	0.71	0.71
DS flow (MGD)	2.2825	2.2782	-	2.2288	2.2860	2.2713	-	2.2327	-	2.2115	2.2463	2.2421	2.2426	-	2.2810	2.2777	2.2757	2.2702	2.2659	2.2622
DS velocity (ft/s)	2.844	4.519	-	3.286	3.460	4.182	3.601	4.409	-	4.465	7.857	9.211	4.234	-	4.576	6.400	5.134	4.505	4.501	4.499
Node	MH-1E	MH-1D	MH-1C	MH-1B	MH-4A	MH-3A	-	-	-	MH L6-F	MH L6-E	MH L6-D	MH L6-B	MH L6-A	-	MH-A13	MH-A12	MH-A11	MH-A10	MH-A9	-



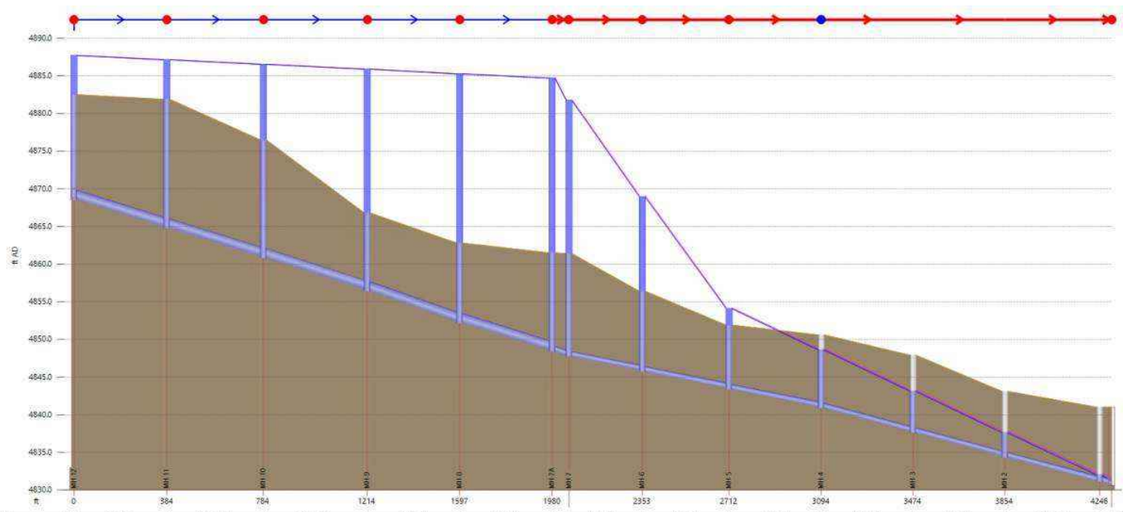
Link	MH-A8.1	MH-A7.1	MH-A6.1	MH-5A.1	MH-A4.1	MH-A3.1	MH-A2.1	-	MH-28.1	MH-27.1	MH-26.1	MH-25.1	MH-24.1
width (in)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.400	0.400	0.401	0.400	0.399	0.401	0.400	0.348	0.809	0.810	0.730	0.727	0.736
ds inv (ft AD)	4934.580	4933.400	4931.640	4930.710	4929.200	4927.200	4925.200	-	4921.330	4917.890	4914.770	4911.660	4908.530
surc	0.71	0.71	0.71	0.70	0.71	0.71	0.70	0.71	0.55	0.55	0.57	0.57	0.57
DS flow (MGD)	2.2556	2.2517	2.2418	2.2392	2.2315	2.2221	2.2115	2.2110	2.2076	2.2041	2.2004	2.1965	2.1927
DS velocity (ft/s)	4.494	4.491	4.483	4.481	4.475	4.468	4.460	4.461	4.891	4.891	4.700	4.692	4.711
Node	-	MH-A7	MH-A6	MH-5A	MH-A4	MH-A3	MH-A2	MH-A1	MH-28	MH-27	MH-26	MH-25	MH-24	MH-23

Section 1

Section 2

Link	MH-23.1	MH-22.1	MH-21.1	-	MH-19B.1	MH-19A.1	MH-19.1	MH-18.1	MH-17.1	MH-16A.1	MH-16.1	MH-15.1	MH-14.1	MH-13.1
width (in)	15.0	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.733	0.730	0.730	-	0.732	0.520	0.940	0.940	0.941	1.168	0.941	0.940	0.940	0.941
ds inv (ft AD)	4905.400	4902.280	4899.160	-	4896.950	4896.040	4892.080	4888.120	4886.300	4884.290	4880.380	4876.460	4872.580	4868.760
surc	0.57	0.57	0.59	-	0.67	0.66	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
DS flow (MGD)	2.1889	2.1858	2.3199	-	2.3171	2.3164	2.3142	2.3121	2.2052	2.2045	2.1944	2.1904	2.1874	1.8697
DS velocity (ft/s)	4.700	4.692	4.758	-	4.128	4.538	5.236	5.235	5.177	5.481	5.079	4.959	4.733	4.486
Node	MH-23	MH-22	MH-21	MH-20	-	MH-19A	MH-19	MH-18	MH-17	MH-16A	MH-16	MH-15	MH-14	MH-13	MH-12

Section 3



Link	MH-12.1	MH-11.1	MH-10.1	MH-9.1	MH-8.1	-	MH-7.1	MH-6.1	MH-5.1	MH-4.1	MH-3.1	MH-2.1	-
width (in)	15.0	15.0	15.0	15.0	15.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	-
grad (%)	0.941	0.855	0.879	1.050	0.940	-	0.594	0.600	0.602	0.808	0.808	0.791	-
ds inv (ft AD)	4864.950	4861.010	4856.600	4852.380	4848.580	-	4845.900	4843.540	4841.040	4837.770	4834.500	4831.200	-
surc	1.00	1.00	1.00	1.00	1.00	-	2.00	2.00	2.00	2.00	2.00	2.00	-
DS flow (MGD)	1.8127	1.7588	1.7073	1.6590	1.6130	-	1.5898	1.5896	0.9224	0.9223	0.9223	0.9223	-
DS velocity (ft/s)	1.660	1.515	1.381	1.275	1.186	-	3.737	5.045	3.154	3.370	3.623	3.848	-
Node	MH-12	MH-11	MH-10	MH-9	MH-8	MH-7A	MH-7	MH-6	MH-5	MH-4	MH-3	MH-2	MH-1

Section 4

New Mexico Water - Rio Del Oro Sewer System
Buildout (BO) 2050 - Peak Hourly Flow (PHF) Results

Eastland Hills

Eastland Hills LS

Red junctions along EHLS forcemain are "break" nodes in model (which are necessary model elements along a pressure pipeline, not regular manholes), and are not experiencing an sewer spill during simulation.

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Tome Vista

EHLS forcemain discharge manhole

Break nodes along Manzerro forcemain; not spilling

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- Within 1 FT
- Potential SSO

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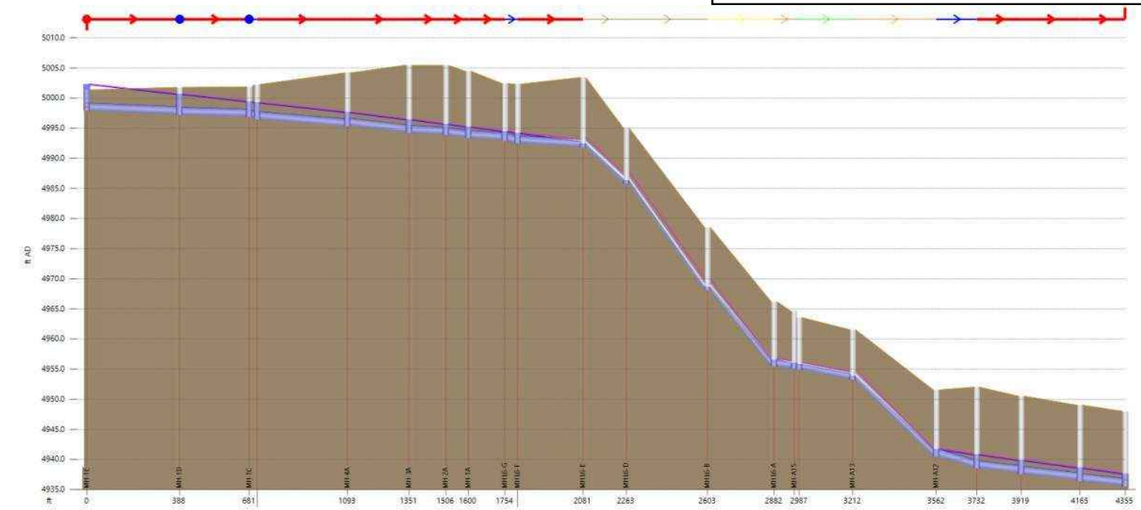
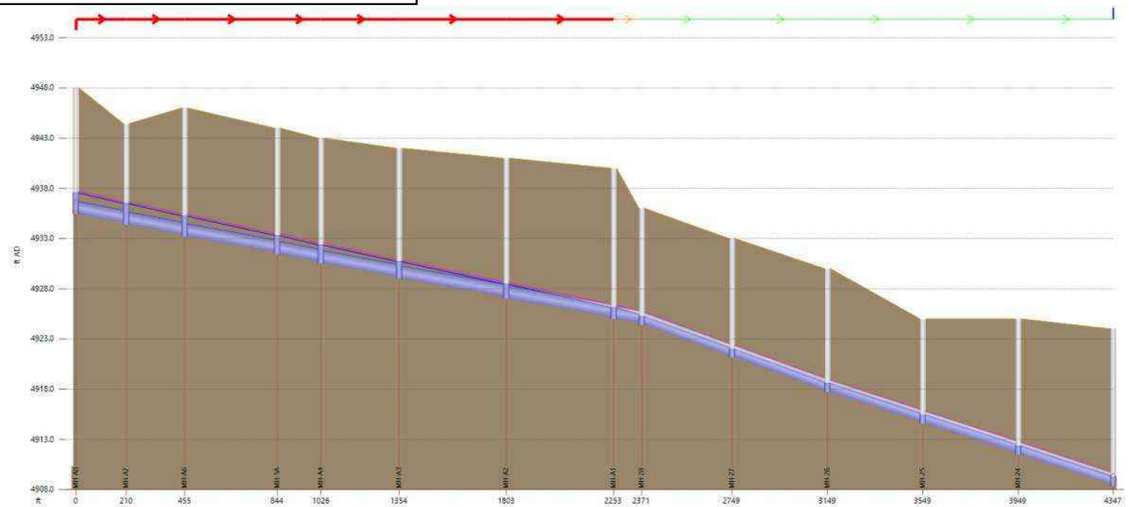
0 1,500 3,000 6,000 Feet

New Mexico Water - Rio Del Oro Sewer System
Buildout (BO) 2050 - Peak Hourly Flow (PHF)
Existing 15" Trunkline Pipe Profiles



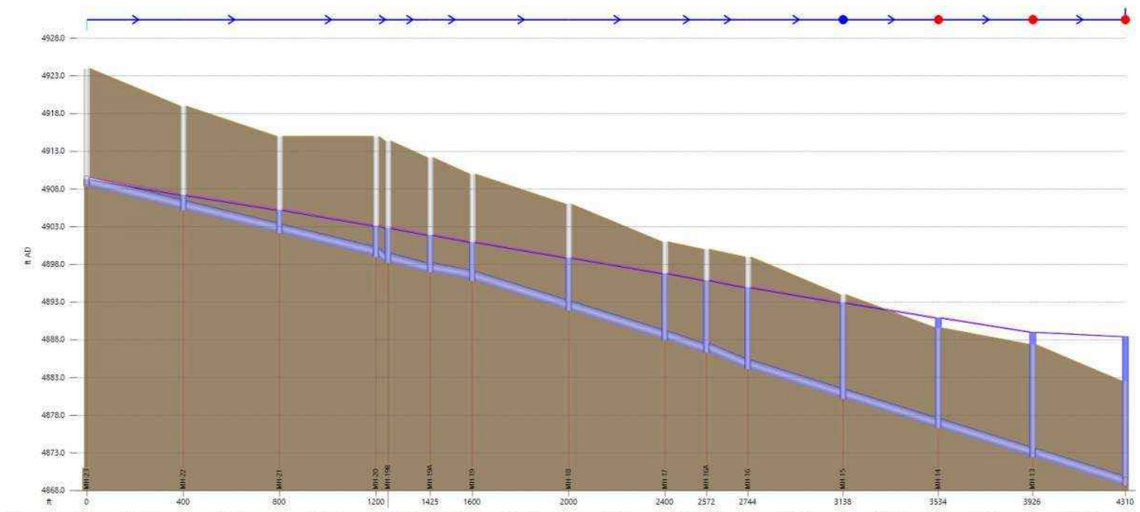
Link	MH-1E-1	MH-1D-1	-	MH-1B-1	MH-4A-1	MH-3A-1	-	MH-1A-1	-	MH-L6-F-1	MH-L6-E-1	MH-L6-D-1	MH-L6-B-1	-	MH-A14-1	MH-A13-1	MH-A12-1	MH-A11-1	MH-A10-1	MH-A9-1
width (in)	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.149	0.113	-	0.309	0.415	0.194	0.382	0.228	-	0.197	3.215	5.169	4.489	-	0.667	3.629	1.012	0.402	0.402	0.400
ds inv (ft AD)	4997.310	4996.880	-	4995.290	4994.310	4993.910	-	4993.000	-	4991.910	4985.970	4968.170	4955.510	-	4953.340	4940.540	4938.720	4937.770	4936.580	4935.620
surc	2.00	2.00	-	2.00	2.00	2.00	2.00	2.00	-	2.00	0.44	0.39	0.79	0.85	0.72	0.90	1.00	2.00	2.00	2.00
DS flow (MGD)	2.8113	2.7657	-	2.6855	2.7957	2.7955	-	2.7954	-	2.7954	2.8512	2.8511	2.8512	-	2.9217	2.9173	2.9105	2.9080	2.9058	2.9041
DS velocity (ft/s)	3.365	4.686	-	3.391	3.483	4.214	3.619	4.409	-	4.905	8.459	9.965	4.355	-	4.992	6.434	5.131	4.764	4.801	4.779
Node	MH-1E	MH-1D	MH-1C	MH-1B	MH-4A	MH-3A	-	-	-	MH-L6-F	MH-L6-E	MH-L6-D	MH-L6-B	MH-L6-A	-	MH-A13	MH-A12	MH-A11	MH-A10	MH-A9	-



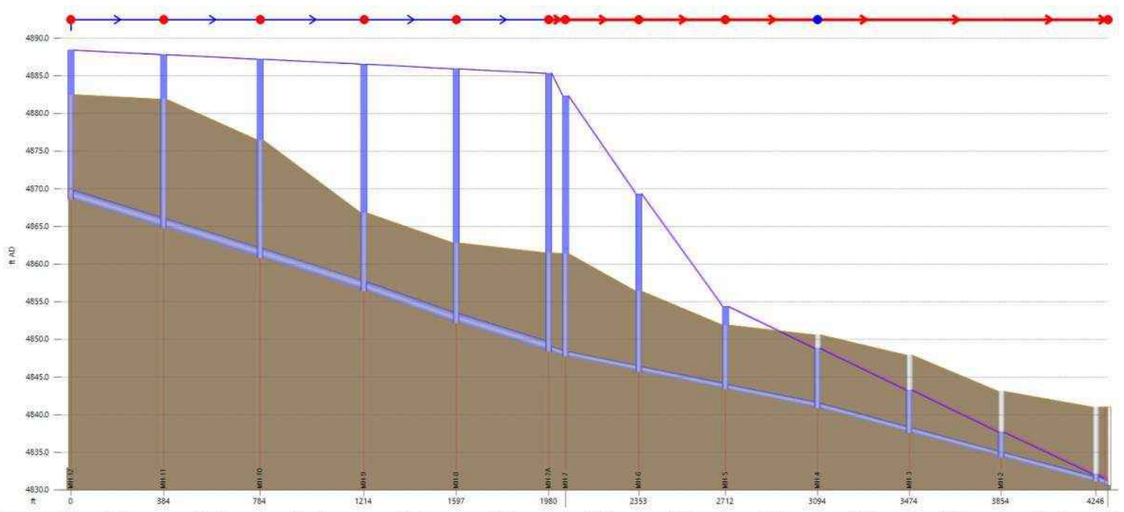
Link	MH-A8.1	MH-A7.1	MH-A6.1	MH-5A.1	MH-A4.1	MH-A3.1	MH-A2.1	-	MH-28.1	MH-27.1	MH-26.1	MH-25.1	MH-24.1
width (in)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.400	0.400	0.401	0.400	0.399	0.401	0.400	0.348	0.809	0.810	0.730	0.727	0.736
ds inv (ft AD)	4934.580	4933.400	4931.640	4930.710	4929.200	4927.200	4925.200	-	4921.330	4917.890	4914.770	4911.660	4908.530
surc	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.90	0.66	0.66	0.69	0.69	0.69
DS flow (MGD)	2.9028	2.9017	2.9009	2.9005	2.9002	2.8999	2.8996	2.8996	2.8995	2.8995	2.8995	2.8994	2.8994
DS velocity (ft/s)	4.752	4.736	4.791	4.737	4.727	4.722	4.775	4.980	5.196	5.199	4.984	4.977	5.001
Node	-	MH-A7	MH-A6	MH-5A	MH-A4	MH-A3	MH-A2	MH-A1	MH-28	MH-27	MH-26	MH-25	MH-24	MH-23

Section 1

Section 2



Link	MH-23-1	MH-22-1	MH-21-1	-	MH-19B-1	MH-19A-1	MH-19-1	MH-18-1	MH-17-1	MH-16A-1	MH-16-1	MH-15-1	MH-14-1	MH-13-1
width (in)	15.0	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.733	0.730	0.730	-	0.732	0.520	0.940	0.940	0.941	1.168	0.941	0.940	0.940	0.941
ds inv (ft AD)	4905.400	4902.280	4899.160	-	4896.950	4896.040	4892.080	4888.120	4886.300	4884.290	4880.380	4876.460	4872.580	4868.760
surc	1.00	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
DS flow (MGD)	2.8824	2.8849	2.9920	-	2.9864	2.9839	2.9812	2.9788	2.9773	2.9758	2.9741	2.9724	2.9710	2.0966
DS velocity (ft/s)	4.984	4.957	5.023	-	4.292	4.980	5.496	5.468	5.439	5.750	5.304	5.124	4.653	4.425
Node	MH-23	MH-22	MH-21	MH-20	-	MH-19A	MH-19	MH-18	MH-17	MH-16A	MH-16	MH-15	MH-14	MH-13	MH-12



Link	MH-12-1	MH-11-1	MH-10-1	MH-9-1	MH-8-1	-	MH-7-1	MH-6-1	MH-5-1	MH-4-1	MH-3-1	MH-2-1	-
width (in)	15.0	15.0	15.0	15.0	15.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	-
grad (%)	0.941	0.935	0.879	1.050	0.940	-	0.594	0.600	0.602	0.808	0.808	0.791	-
ds inv (ft AD)	4864.950	4861.010	4856.600	4852.380	4848.580	-	4845.900	4843.540	4841.040	4837.770	4834.500	4831.200	-
surc	1.00	1.00	1.00	1.00	1.00	-	2.00	2.00	2.00	2.00	2.00	2.00	-
DS flow (MGD)	2.0042	1.9111	1.8160	1.7274	1.6443	-	1.6041	1.6038	0.9274	0.9274	0.9274	0.9274	-
DS velocity (ft/s)	1.831	1.645	1.478	1.336	1.218	-	3.748	5.077	3.154	3.375	3.634	3.959	-
Node	MH-12	MH-11	MH-10	MH-9	MH-8	MH-7A	MH-7	MH-6	MH-5	MH-4	MH-3	MH-2	MH-1

Section 3

Section 4

ATTACHMENT 5

New Mexico Water - Rio Del Oro Sewer System
Buildout (BO) 2050 w/ 8" Trunk Upsizing to 15"
Peak Hourly Flow (PHF) Results

Eastland Hills

Eastland Hills LS

Red junctions along EHLS forcemain are "break" nodes in model (which are necessary model elements along a pressure pipeline, not regular manholes), and are not experiencing an sewer spill during simulation.

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Tome Vista

EHLS forcemain discharge manhole

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Existing 8" pipe segments upsized to 15"

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Legend

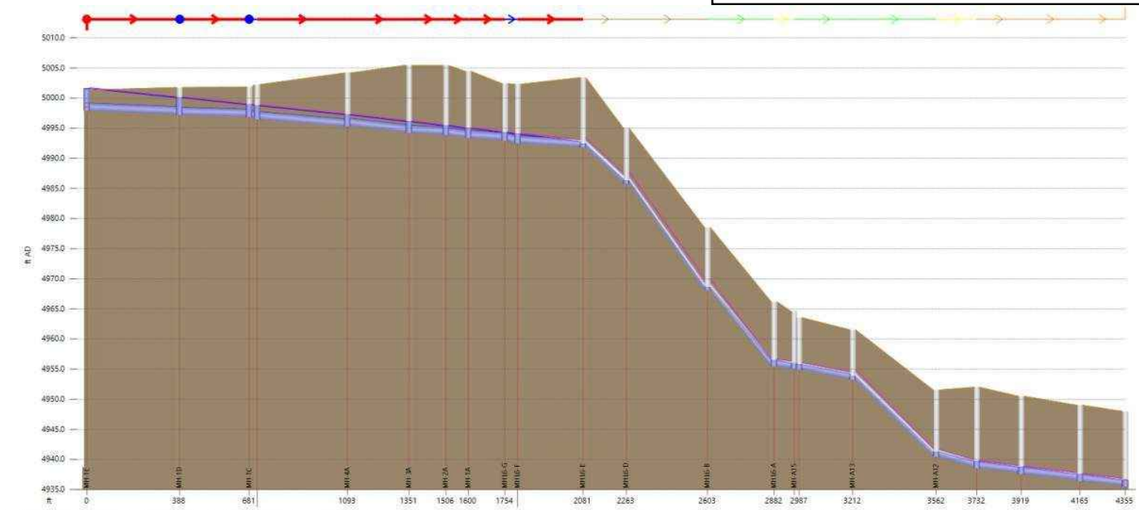
MH Flood Depth (ft)
- Within 3 FT
- Within 1 FT
- Potential SSO

Pipe Max Surcharge (d/D)
- 0 - 0.49
- 0.50 - 0.74
- 0.75 - 0.84
- 0.85 - 0.99
- 1
- 2

N

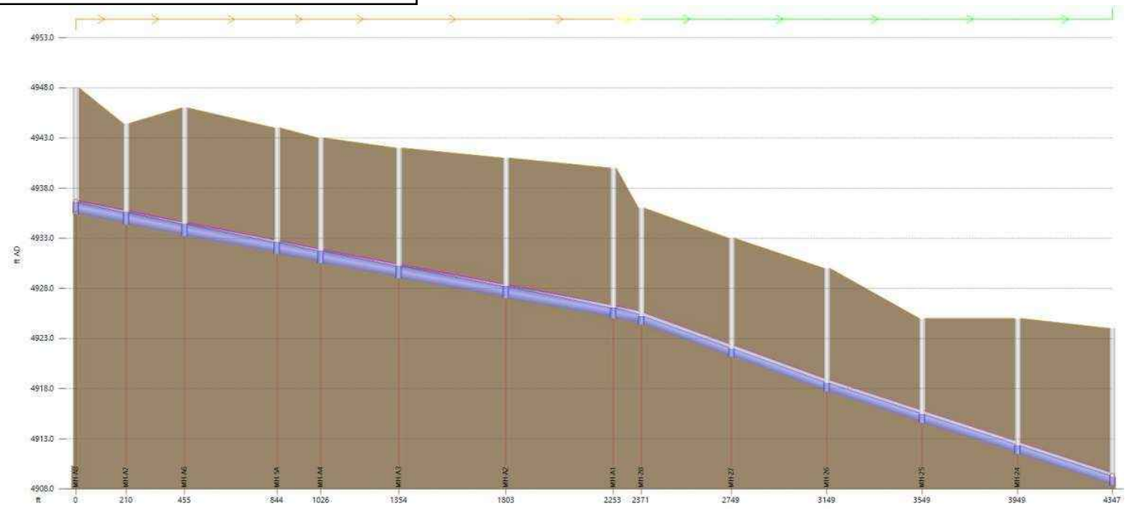
0 1,500 3,000 6,000 Feet

New Mexico Water - Rio Del Oro Sewer System
Buildout (BO) 2050 - Peak Hourly Flow (PHF) w/ 8" Upsizing
Existing 15" Trunkline Pipe Profiles



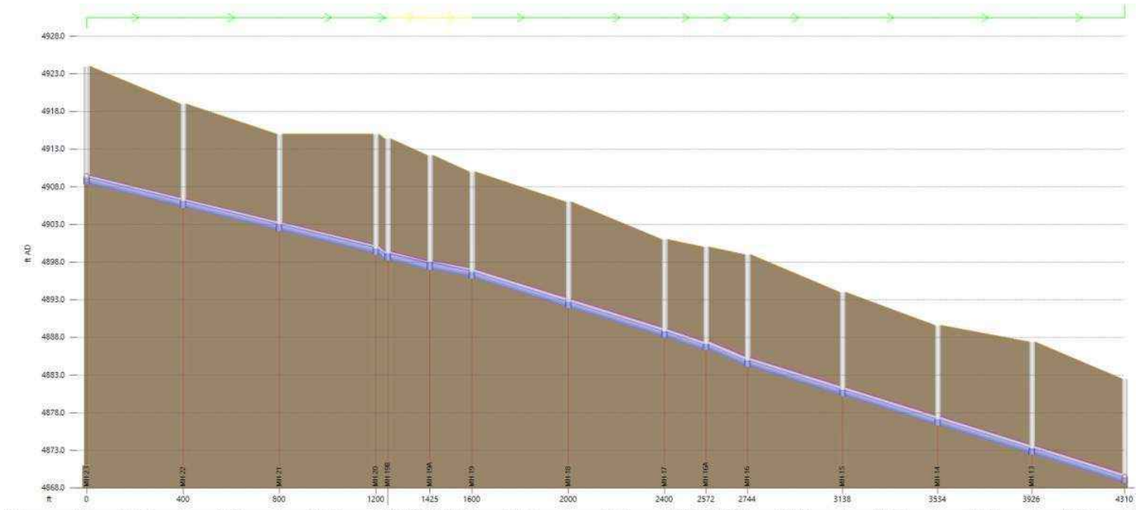
Link	MH-1E-1	MH-1D-1	-	MH-1B-1	MH-4A-1	MH-3A-1	-	MH-1A-1	-	MH-L6-F-1	MH-L6-E-1	MH-L6-D-1	MH-L6-B-1	-	MH-A14-1	MH-A13-1	MH-A12-1	MH-A11-1	MH-A10-1	MH-A9-1
width (in)	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.149	0.113	-	0.309	0.415	0.194	0.382	0.228	-	0.197	3.215	5.169	4.489	-	0.667	3.629	1.012	0.402	0.402	0.400
ds inv (ft AD)	4997.310	4996.880	-	4995.290	4994.310	4993.910	-	4993.000	-	4991.910	4985.970	4968.170	4955.510	-	4953.340	4940.540	4938.720	4937.770	4936.580	4935.620
surc	2.00	2.00	-	2.00	2.00	2.00	2.00	2.00	-	2.00	0.43	0.38	0.75	0.81	0.69	0.54	0.76	0.91	0.92	0.90
DS flow (MGD)	2.7654	2.6731	-	2.6228	2.6954	2.6943	-	2.6934	-	2.6921	2.7383	2.7382	2.7378	-	2.7948	2.7943	2.7893	2.7768	2.7639	2.7530
DS velocity (ft/s)	3.341	4.629	-	3.360	3.457	4.199	3.621	4.396	-	4.828	8.356	9.837	4.316	-	4.896	6.428	5.127	4.774	4.792	4.779
Node	MH-1E	MH-1D	MH-1C	MH-1B	MH-4A	MH-3A	-	-	-	MH-L6-F	MH-L6-E	MH-L6-D	MH-L6-B	MH-L6-A	-	MH-A13	MH-A12	MH-A11	MH-A10	MH-A9	-

Section 1



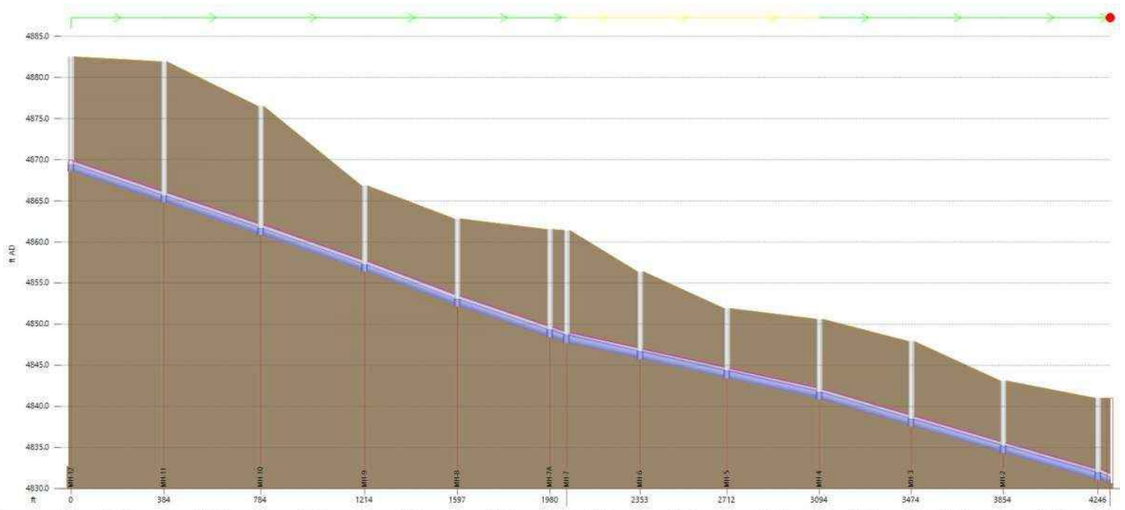
Link	MH-A8.1	MH-A7.1	MH-A6.1	MH-5A.1	MH-4A.1	MH-3A.1	MH-2A.1	-	MH-2B.1	MH-2.1	MH-1.1	MH-A1.1	MH-24.1
width (in)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.400	0.400	0.401	0.400	0.399	0.401	0.400	0.348	0.809	0.810	0.730	0.727	0.736
ds inv (ft AD)	4934.580	4933.400	4931.640	4930.710	4929.200	4927.200	4925.200	-	4921.330	4917.890	4914.770	4911.660	4908.530
surc	0.91	0.94	0.95	0.90	0.96	0.97	0.94	0.83	0.63	0.63	0.65	0.65	0.65
DS flow (MGD)	2.7409	2.7313	2.7210	2.7152	2.7086	2.7033	2.7028	2.7028	2.7028	2.7027	2.7027	2.7027	2.7026
DS velocity (ft/s)	4.761	4.737	4.783	4.728	4.722	4.719	4.778	4.832	5.122	5.125	4.917	4.911	4.934
Node	-	MH-A7	MH-A6	MH-5A	MH-4A	MH-3A	MH-2A	MH-A1	MH-2B	MH-2	MH-1	MH-24	MH-23

Section 2



Link	MH-23-1	MH-22-1	MH-21-1	-	MH-19B-1	MH-19A-1	MH-19-1	MH-18-1	MH-17-1	MH-16A-1	MH-16-1	MH-15-1	MH-14-1	MH-13-1
width (in)	15.0	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.733	0.730	0.730	-	0.732	0.520	0.940	0.940	0.941	1.168	0.941	0.940	0.940	0.941
ds inv (ft AD)	4905.400	4902.280	4899.160	-	4896.950	4896.040	4892.060	4888.120	4886.300	4884.290	4880.380	4876.460	4872.580	4868.760
surc	0.65	0.65	0.68	-	0.78	0.77	0.62	0.62	0.62	0.59	0.62	0.62	0.62	0.64
DS flow (MGD)	2.7026	2.7026	2.8459	-	2.8458	2.8458	2.8457	2.8457	2.8457	2.8457	2.8456	2.8456	2.8455	3.0029
DS velocity (ft/s)	4.924	4.917	4.967	-	4.276	4.937	5.494	5.494	5.497	5.865	5.496	5.494	5.493	5.559
Node	MH-23	MH-22	MH-21	MH-20	-	MH-19A	MH-19	MH-18	MH-17	MH-16A	MH-16	MH-15	MH-14	MH-13	MH-12

Section 3



Link	MH-12.1	MH-11.1	MH-10.1	MH-9.1	MH-8.1	-	MH-7.1	MH-6.1	MH-5.1	MH-4.1	MH-3.1	MH-2.1	-
width (in)	15.0	15.0	15.0	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	15.0	-
grad (%)	0.941	0.935	0.979	1.050	0.940	-	0.594	0.600	0.602	0.808	0.808	0.791	-
ds inv (ft AD)	4864.950	4861.010	4856.600	4852.380	4848.580	-	4845.900	4843.540	4841.040	4837.770	4834.500	4831.200	-
surc	0.64	0.65	0.64	0.63	0.64	-	0.77	0.76	0.76	0.68	0.68	0.69	-
DS flow (MGD)	3.0027	3.0026	3.0025	3.0024	3.0023	-	3.0021	3.0019	3.0060	3.0059	3.0057	3.0056	-
DS velocity (ft/s)	5.559	5.544	5.647	5.704	5.556	-	5.054	5.054	5.057	5.229	5.229	5.183	-
Node	MH-12	MH-11	MH-10	MH-9	MH-8	MH-7A	MH-7	MH-6	MH-5	MH-4	MH-3	MH-2	MH-1

Section 4

New Mexico Water - Rio Del Oro Sewer System

Buildout (BO) 2050 w/ 8" Trunk Upsizing to 15"
Peak Hourly Flow (PHF) Results

Eastland Hills

Eastland Hills LS

Red junctions along EHLS forcemain are "break" nodes in model (which are necessary model elements along a pressure pipeline, not regular manholes), and are not experiencing an sewer spill during simulation.

Manzerro Plaza

Tome Vista

EHLS forcemain discharge manhole

Break nodes along Manzerro forcemain; not spilling

Manzerro LS

Sierra Madre

Future Meyers Group

Desert View Elementary

Valencia High School

Tome Elementary

Valencia Middle School

UNM - Valencia

New 15" trunkline CIP that receives Manzerro LS flow

Las Maravillas

Existing 8" pipe segments upsized to 15"

Pasitos Del Cielo & Habitat

Los Lunas Sports Complex

Valencia

Legend

MH Flood Depth (ft)

- Within 3 FT
- Within 1 FT
- Potential SSO

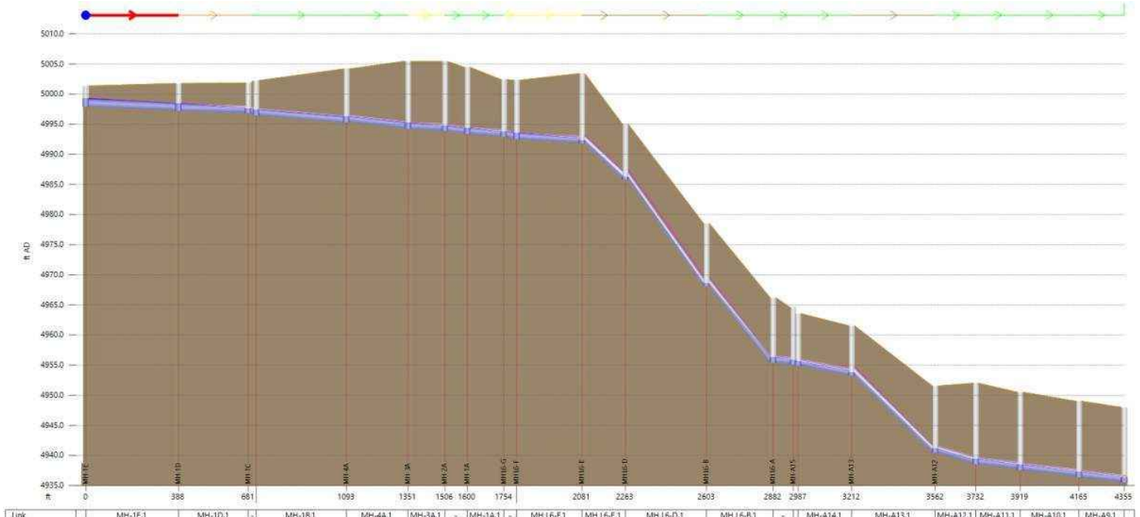
Pipe Max Surcharge (d/D)

- 0 - 0.49
- 0.50 - 0.74
- 0.75 - 0.84
- 0.85 - 0.99
- 1
- 2

N

0 1,500 3,000 6,000 Feet

New Mexico Water - Rio Del Oro Sewer System
Buildout (BO) 2050 - Peak Hourly Flow (PHF) w/ 8" Upsizing & New 15" Trunk
Existing 15" Trunkline Pipe Profiles

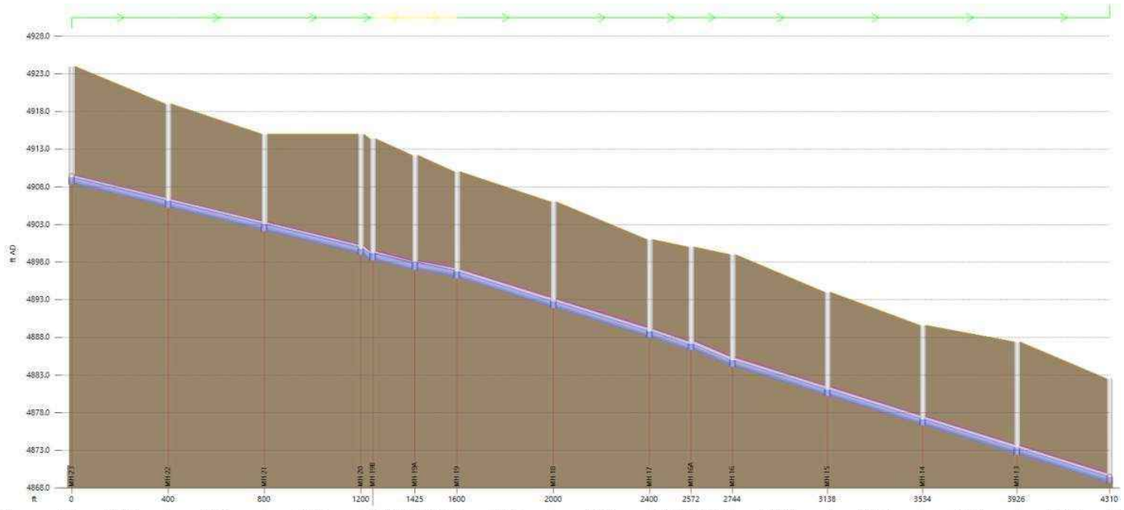


Link	MH-1E-1	MH-1D-1	-	MH-1B-1	MH-4A-1	MH-3A-1	-	MH-1A-1	-	MH L6-F-1	MH L6-E-1	MH L6-D-1	MH L6-B-1	-	MH-A14-1	MH-A13-1	MH-A12-1	MH-A11-1	MH-A10-1	MH-A9-1
width (in)	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.149	0.113	-	0.309	0.415	0.194	0.382	0.228	-	0.197	3.215	5.169	4.489	-	0.667	3.629	1.012	0.402	0.402	0.400
ds inv (ft AD)	4997.310	4996.880	-	4995.290	4994.310	4993.910	-	4993.000	-	4991.910	4985.970	4968.170	4955.510	-	4953.340	4940.540	4938.720	4937.770	4936.580	4935.620
surc	2.00	0.94	-	0.72	0.70	0.78	0.67	0.75	-	0.83	0.37	0.33	0.60	0.67	0.57	0.43	0.52	0.67	0.67	0.67
DS flow (MGD)	1.8875	1.8875	-	1.8876	1.9981	1.9981	-	1.9981	-	1.9981	2.0445	2.0445	2.0445	-	2.1026	2.1026	2.1026	2.1026	2.1026	2.1026
DS velocity (ft/s)	2.624	4.216	-	3.070	3.359	4.108	3.526	4.299	-	4.300	7.622	8.927	4.156	-	4.491	6.370	5.111	4.376	4.376	4.376
Node	MH-1E	MH-1D	MH-1C	MH-1B	MH-4A	MH-3A	-	-	-	MH L6-F	MH L6-E	MH L6-D	MH L6-B	MH L6-A	-	MH-A13	MH-A12	MH-A11	MH-A10	MH-A9	-

Section 1

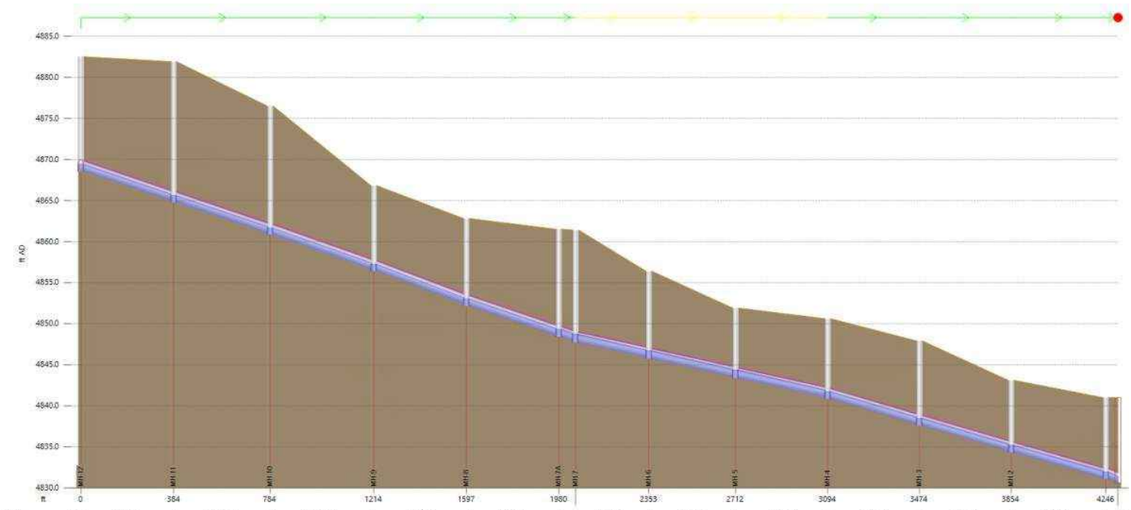
Link	MH-A8.1	MH-A7.1	MH-A6.1	MH-5A.1	MH-A4.1	MH-A3.1	MH-A2.1	-	MH-28.1	MH-27.1	MH-26.1	MH-25.1	MH-24.1
width (in)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.400	0.400	0.401	0.400	0.399	0.401	0.400	0.348	0.809	0.810	0.730	0.727	0.736
ds inv (ft AD)	4934.580	4933.400	4931.640	4930.710	4929.200	4927.200	4925.200	-	4921.330	4917.890	4914.770	4911.660	4908.530
surc	0.67	0.67	0.68	0.67	0.68	0.68	0.68	0.68	0.64	0.64	0.67	0.67	0.66
DS flow (MGD)	2.1026	2.1026	2.1026	2.1026	2.1026	2.1026	2.1026	2.1026	2.7705	2.7690	2.7674	2.7657	2.7641
DS velocity (ft/s)	4.376	4.376	4.376	4.376	4.376	4.376	4.376	4.377	5.149	5.151	4.940	4.933	4.956
Node	-	MH-A7	MH-A6	MH-5A	MH-A4	MH-A3	MH-A2	MH-A1	MH-28	MH-27	MH-26	MH-25	MH-24	MH-23

Section 2



Link	MH-23.1	MH-22.1	MH-21.1	-	MH-19B.1	MH-19A.1	MH-19.1	MH-18.1	MH-17.1	MH-16A.1	MH-16.1	MH-15.1	MH-14.1	MH-13.1
width (in)	15.0	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.733	0.730	0.730	-	0.732	0.520	0.940	0.940	0.941	1.168	0.941	0.940	0.940	0.941
ds inv (ft AD)	4905.400	4902.280	4899.160	-	4896.950	4896.040	4892.080	4888.120	4886.300	4884.290	4880.380	4876.460	4872.580	4868.760
surc	0.66	0.66	0.69	-	0.80	0.79	0.63	0.63	0.63	0.60	0.63	0.63	0.63	0.66
DS flow (MGD)	2.7624	2.7606	2.9287	-	2.9274	2.9271	2.9262	2.9254	2.9248	2.9245	2.9236	2.9228	2.9219	3.0773
DS velocity (ft/s)	4.945	4.938	4.997	-	4.297	4.998	5.527	5.526	5.529	5.905	5.526	5.525	5.524	5.587
Node	MH-23	MH-22	MH-21	MH-20	-	MH-19A	MH-19	MH-18	MH-17	MH-16A	MH-16	MH-15	MH-14	MH-13	MH-12

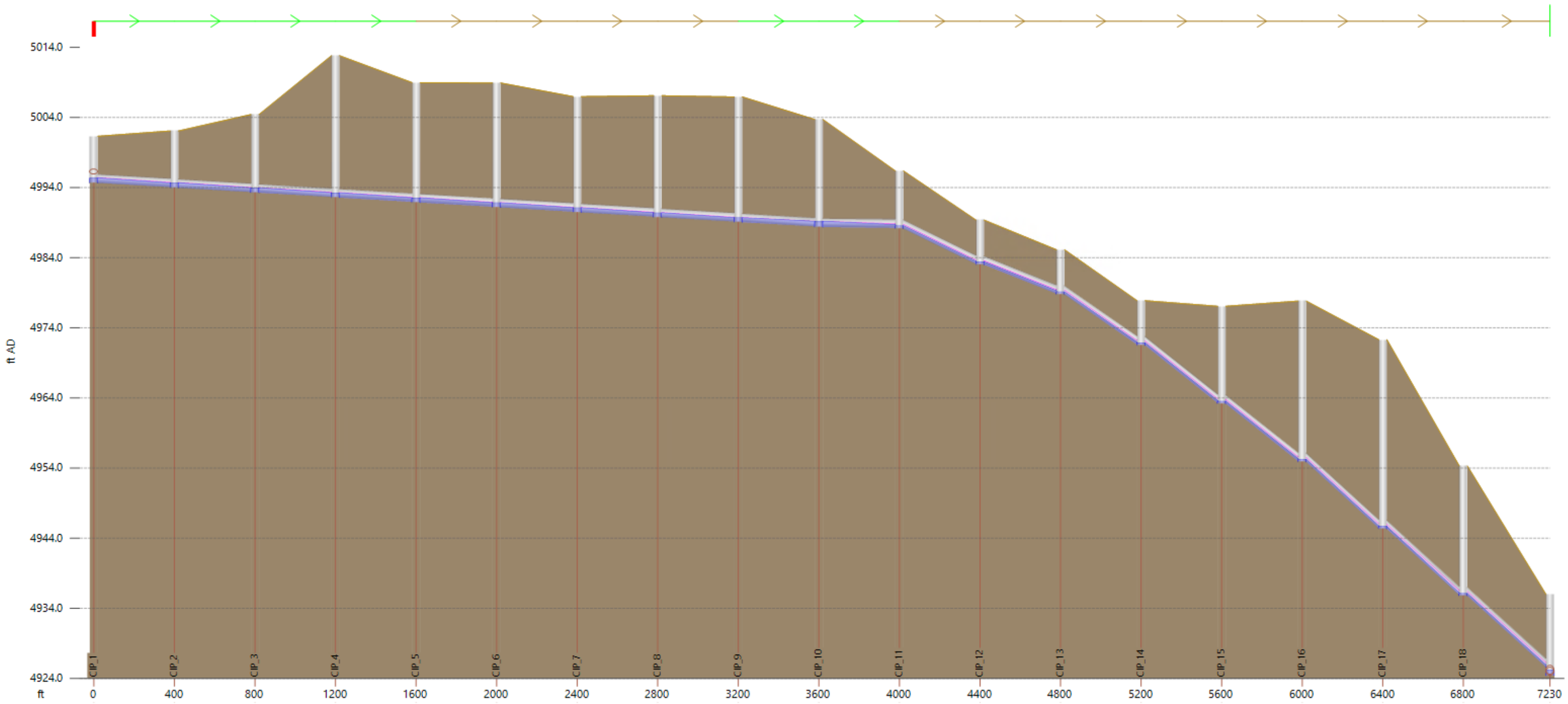
Section 3



Link	MH-12.1	MH-11.1	MH-10.1	MH-9.1	MH-8.1	-	MH-7.1	MH-6.1	MH-5.1	MH-4.1	MH-3.1	MH-2.1	-
width (in)	15.0	15.0	15.0	15.0	15.0	-	15.0	15.0	15.0	15.0	15.0	15.0	-
grad (%)	0.941	0.935	0.979	1.050	0.940	-	0.594	0.600	0.602	0.808	0.808	0.791	-
ds inv (ft AD)	4864.950	4861.010	4856.600	4852.380	4848.580	-	4845.900	4843.540	4841.040	4837.770	4834.500	4831.200	-
surc	0.66	0.66	0.65	0.64	0.66	-	0.78	0.78	0.78	0.69	0.69	0.70	-
DS flow (MGD)	3.0765	3.0758	3.0751	3.0744	3.0737	-	3.0729	3.0721	3.0754	3.0748	3.0743	3.0737	-
DS velocity (ft/s)	5.587	5.571	5.675	5.735	5.582	-	5.108	5.107	5.110	5.250	5.250	5.203	-
Node	MH-12	MH-11	MH-10	MH-9	MH-8	MH-7A	MH-7	MH-6	MH-5	MH-4	MH-3	MH-2	MH-1

Section 4

New Mexico Water - Rio Del Oro Sewer System
Buildout (BO) 2050 - Peak Hourly Flow (PHF) w/ 8" Upsizing & New 15" Trunk
New 15" Trunkline Pipe Profile

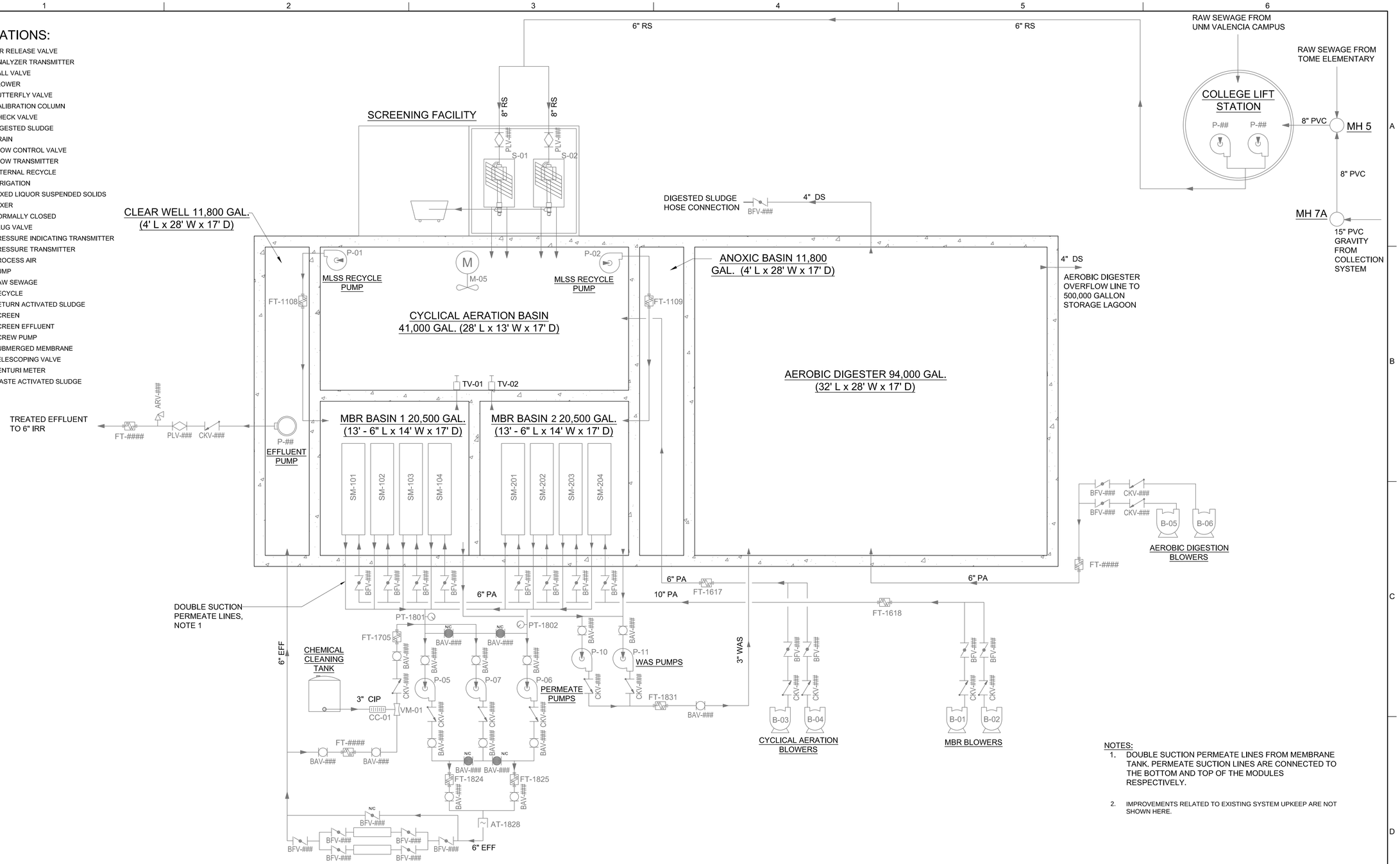


Link	CIP_1.1	CIP_2.1	CIP_3.1	CIP_4.1	CIP_5.1	CIP_6.1	CIP_7.1	CIP_8.1	CIP_9.1	CIP_10.1	CIP_11.1	CIP_12.1	CIP_13.1	CIP_14.1	CIP_15.1	CIP_16.1	CIP_17.1	CIP_18.1
width (in)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
grad (%)	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.025	1.265	1.032	1.792	2.053	2.050	2.362	2.363	2.363
ds inv (ft AD)	4994.070	4993.370	4992.670	4991.970	4991.270	4990.570	4989.870	4989.170	4988.470	4988.270	4983.110	4978.880	4971.610	4963.300	4955.000	4945.450	4935.900	4925.640
surc	0.52	0.52	0.52	0.51	0.50	0.49	0.48	0.47	0.53	0.61	0.28	0.29	0.26	0.25	0.25	0.24	0.24	0.24
DS flow (MGD)	0.8671	0.8565	0.8385	0.8139	0.7878	0.7626	0.7399	0.7218	0.6971	0.6830	0.6817	0.6801	0.6789	0.6779	0.6770	0.6761	0.6751	0.6741
DS velocity (ft/s)	3.095	2.940	2.818	2.696	2.646	2.624	2.604	2.572	1.640	3.064	3.833	3.593	4.260	4.436	4.432	4.621	4.618	4.615
Node	CIP_1	CIP_2	CIP_3	CIP_4	CIP_5	CIP_6	CIP_7	CIP_8	CIP_9	CIP_10	CIP_11	CIP_12	CIP_13	CIP_14	CIP_15	CIP_16	CIP_17	CIP_18	-

Appendix C – Process Flow Diagrams

ABBREVIATIONS:

ARV	AIR RELEASE VALVE
AT	ANALYZER TRANSMITTER
BAV	BALL VALVE
B	BLOWER
BFV	BUTTERFLY VALVE
CC	CALIBRATION COLUMN
CKV	CHECK VALVE
DS	DIGESTED SLUDGE
DR	DRAIN
FCV	FLOW CONTROL VALVE
FT	FLOW TRANSMITTER
IR	INTERNAL RECYCLE
IRR	IRRIGATION
MLSS	MIXED LIQUOR SUSPENDED SOLIDS
M	MIXER
N/C	NORMALLY CLOSED
PLV	PLUG VALVE
PIT	PRESSURE INDICATING TRANSMITTER
PT	PRESSURE TRANSMITTER
PA	PROCESS AIR
P	PUMP
RS	RAW SEWAGE
RE	RECYCLE
RAS	RETURN ACTIVATED SLUDGE
S	SCREEN
SE	SCREEN EFFLUENT
SP	SCREW PUMP
SM	SUBMERGED MEMBRANE
TV	TELESCOPING VALVE
VM	VENTURI METER
WAS	WASTE ACTIVATED SLUDGE



NOTES:

1. DOUBLE SUCTION PERMEATE LINES FROM MEMBRANE TANK. PERMEATE SUCTION LINES ARE CONNECTED TO THE BOTTOM AND TOP OF THE MODULES RESPECTIVELY.
2. IMPROVEMENTS RELATED TO EXISTING SYSTEM UPKEEP ARE NOT SHOWN HERE.

NO	DATE	REVISION	BY	APVD

PRELIMINARY
NOT FOR
CONSTRUCTION

DESIGN
DRAWN
CHECKED
APPROVED

WATERWORKS ENGINEERS
8650 ALAMEDA BLVD., NE, SUITE 103E ALBUQUERQUE, NM

NEW MEXICO WATER SERVICE COMPANY

RIO DEL ORO (RDO) SANITARY SEWER MASTER PLAN UPDATE

VALENCIA COUNTY, NEW MEXICO

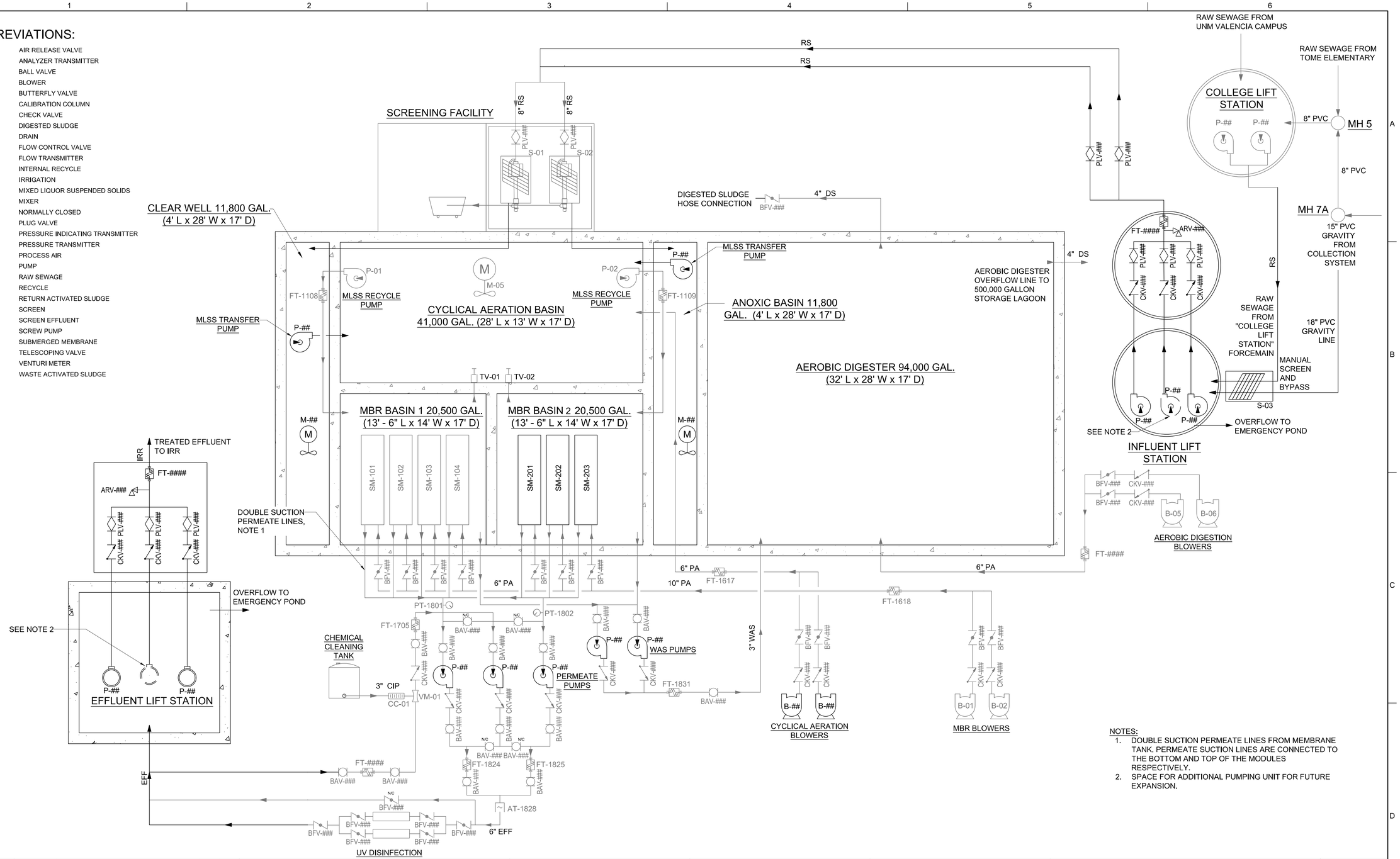
GENERAL

PROCESS FLOW DIAGRAM EXISTING 2024

DATE: OCTOBER 2024
PROJECT NO.: 24-007
DRAWING NO.: PFD-EX
SHEET NO.: 1

ABBREVIATIONS:

ARV	AIR RELEASE VALVE
AT	ANALYZER TRANSMITTER
BAV	BALL VALVE
B	BLOWER
BFV	BUTTERFLY VALVE
CC	CALIBRATION COLUMN
CKV	CHECK VALVE
DS	DIGESTED SLUDGE
DR	DRAIN
FCV	FLOW CONTROL VALVE
FT	FLOW TRANSMITTER
IR	INTERNAL RECYCLE
IRR	IRRIGATION
MLSS	MIXED LIQUOR SUSPENDED SOLIDS
M	MIXER
N/C	NORMALLY CLOSED
PLV	PLUG VALVE
PIT	PRESSURE INDICATING TRANSMITTER
PT	PRESSURE TRANSMITTER
PA	PROCESS AIR
P	PUMP
RS	RAW SEWAGE
RE	RECYCLE
RAS	RETURN ACTIVATED SLUDGE
S	SCREEN
SE	SCREEN EFFLUENT
SP	SCREW PUMP
SM	SUBMERGED MEMBRANE
TV	TELESCOPING VALVE
VM	VENTURI METER
WAS	WASTE ACTIVATED SLUDGE



NOTES:
1. DOUBLE SUCTION PERMEATE LINES FROM MEMBRANE TANK. PERMEATE SUCTION LINES ARE CONNECTED TO THE BOTTOM AND TOP OF THE MODULES RESPECTIVELY.
2. SPACE FOR ADDITIONAL PUMPING UNIT FOR FUTURE EXPANSION.

NO	DATE	REVISION	BY	APVD

PRELIMINARY
NOT FOR
CONSTRUCTION

DESIGN
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WATERWORKS ENGINEERS
8650 ALAMEDA BLVD., NE, SUITE 103E ALBUQUERQUE, NM

NEW MEXICO WATER SERVICE COMPANY

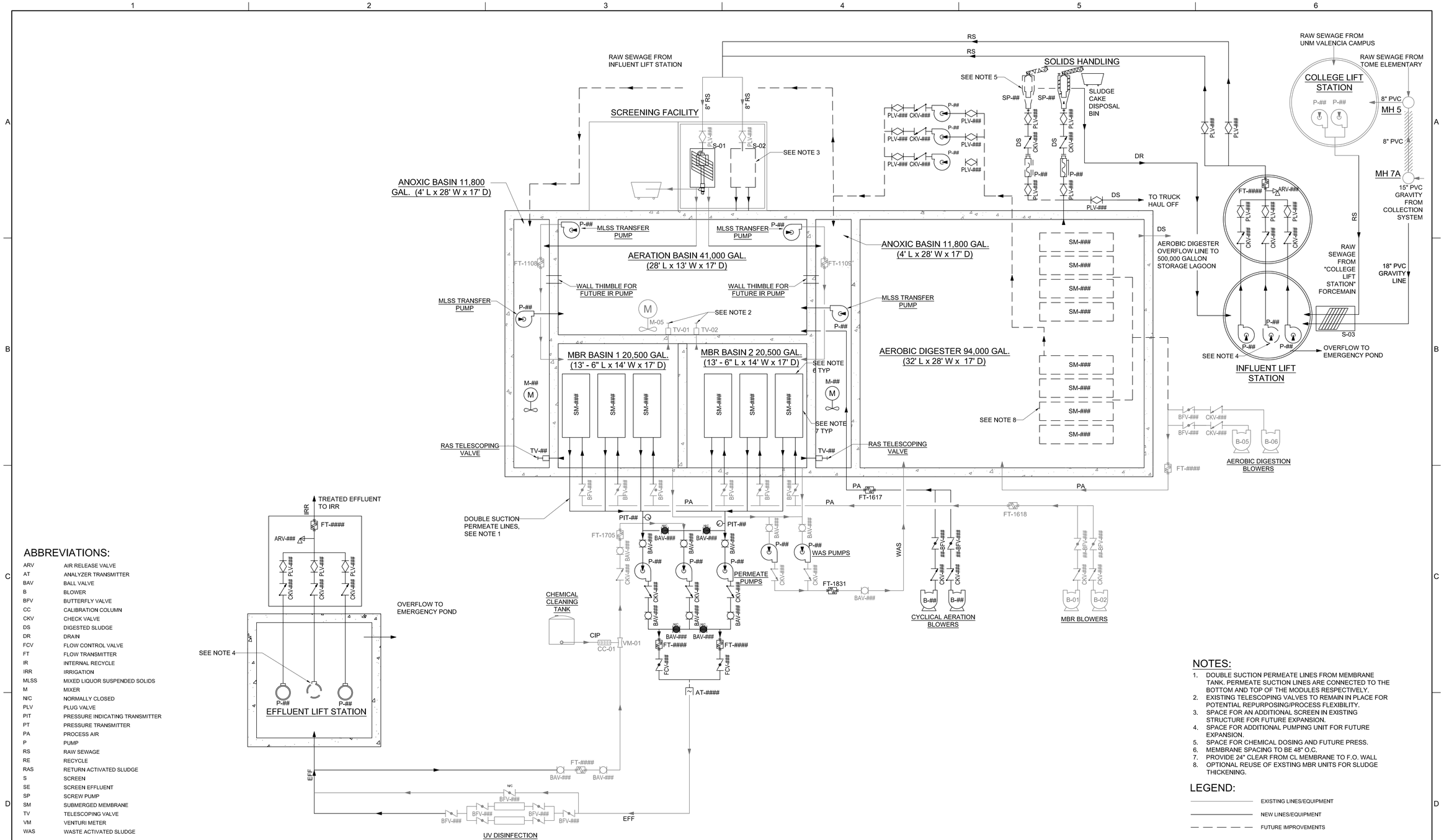
RIO DEL ORO (RDO) SANITARY SEWER MASTER PLAN UPDATE

VALENCIA COUNTY, NEW MEXICO

GENERAL

PROCESS FLOW DIAGRAM
EXISTING 2024 + COMMITTED CONDITIONS

DATE: OCTOBER 2024
PROJECT NO.: 24-007
DRAWING NO.: PFD-COMM
SHEET NO.: 2



ABBREVIATIONS:

ARV	AIR RELEASE VALVE
AT	ANALYZER TRANSMITTER
BAV	BALL VALVE
B	BLOWER
BFV	BUTTERFLY VALVE
CC	CALIBRATION COLUMN
CKV	CHECK VALVE
DS	DIGESTED SLUDGE
DR	DRAIN
FCV	FLOW CONTROL VALVE
FT	FLOW TRANSMITTER
IR	INTERNAL RECYCLE
IRR	IRRIGATION
MLSS	MIXED LIQUOR SUSPENDED SOLIDS
M	MIXER
N/C	NORMALLY CLOSED
PLV	PLUG VALVE
PIT	PRESSURE INDICATING TRANSMITTER
PT	PRESSURE TRANSMITTER
PA	PROCESS AIR
P	PUMP
RS	RAW SEWAGE
RE	RECYCLE
RAS	RETURN ACTIVATED SLUDGE
S	SCREEN
SE	SCREEN EFFLUENT
SP	SCREW PUMP
SM	SUBMERGED MEMBRANE
TV	TELESCOPING VALVE
VM	VENTURI METER
WAS	WASTE ACTIVATED SLUDGE

NOTES:

1. DOUBLE SUCTION PERMEATE LINES FROM MEMBRANE TANK. PERMEATE SUCTION LINES ARE CONNECTED TO THE BOTTOM AND TOP OF THE MODULES RESPECTIVELY.
2. EXISTING TELESCOPING VALVES TO REMAIN IN PLACE FOR POTENTIAL REPURPOSING/PROCESS FLEXIBILITY.
3. SPACE FOR AN ADDITIONAL SCREEN IN EXISTING STRUCTURE FOR FUTURE EXPANSION.
4. SPACE FOR ADDITIONAL PUMPING UNIT FOR FUTURE EXPANSION.
5. SPACE FOR CHEMICAL DOSING AND FUTURE PRESS.
6. MEMBRANE SPACING TO BE 48" O.C.
7. PROVIDE 24" CLEAR FROM CL MEMBRANE TO F.O. WALL
8. OPTIONAL REUSE OF EXSTING MBR UNITS FOR SLUDGE THICKENING.

LEGEND:

- EXISTING LINES/EQUIPMENT
- NEW LINES/EQUIPMENT
- FUTURE IMPROVEMENTS

NO	DATE	REVISION	BY	APVD

PRELIMINARY
NOT FOR
CONSTRUCTION

DESIGN
DRAWN
CHECKED
APPROVED

WATERWORKS ENGINEERS
8650 ALAMEDA BLVD., NE, SUITE 103E ALBUQUERQUE, NM

NEW MEXICO WATER SERVICE COMPANY

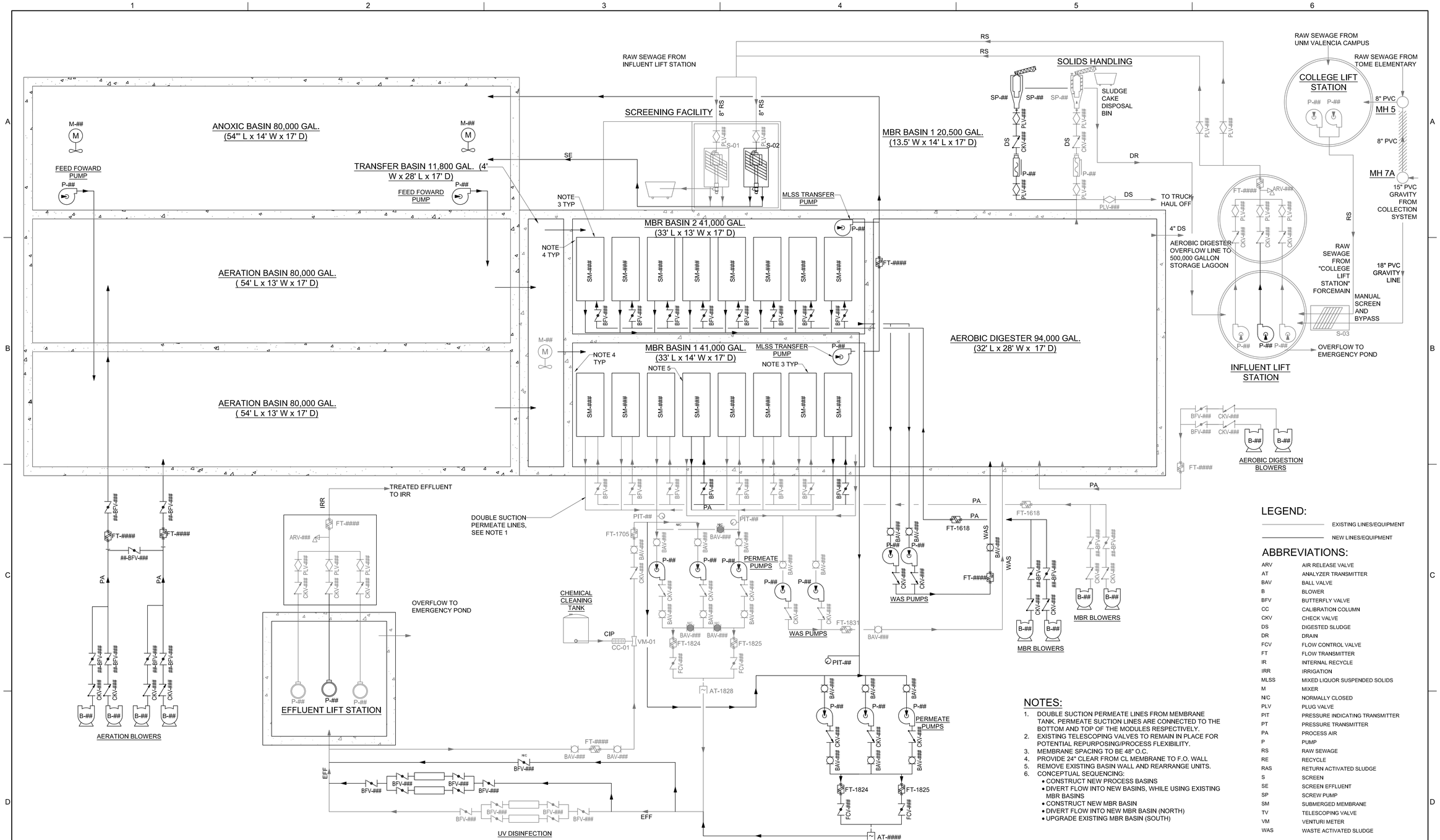
RIO DEL ORO (RDO) SANITARY SEWER MASTER PLAN UPDATE

VALENCIA COUNTY, NEW MEXICO

GENERAL

PROCESS FLOW DIAGRAM NEAR TERM 2030 IMPROVEMENTS

DATE: OCTOBER 2024
PROJECT NO.: 24-007
DRAWING NO.: PFD-NT
SHEET NO.: 3



LEGEND:

- EXISTING LINES/EQUIPMENT
- NEW LINES/EQUIPMENT

ABBREVIATIONS:

ARV	AIR RELEASE VALVE
AT	ANALYZER TRANSMITTER
BAV	BALL VALVE
B	BLOWER
BFV	BUTTERFLY VALVE
CC	CALIBRATION COLUMN
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DS	DIGESTED SLUDGE
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IRR	IRRIGATION
MLSS	MIXED LIQUOR SUSPENDED SOLIDS
M	MIXER
N/C	NORMALLY CLOSED
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PIT	PRESSURE INDICATING TRANSMITTER
PT	PRESSURE TRANSMITTER
PA	PROCESS AIR
P	PUMP
RS	RAW SEWAGE
RE	RECYCLE
RAS	RETURN ACTIVATED SLUDGE
S	SCREEN
SE	SCREEN EFFLUENT
SP	SCREW PUMP
SM	SUBMERGED MEMBRANE
TV	TELESCOPING VALVE
VM	VENTURI METER
WAS	WASTE ACTIVATED SLUDGE

NOTES:

1. DOUBLE SUCTION PERMEATE LINES FROM MEMBRANE TANK. PERMEATE SUCTION LINES ARE CONNECTED TO THE BOTTOM AND TOP OF THE MODULES RESPECTIVELY.
2. EXISTING TELESCOPING VALVES TO REMAIN IN PLACE FOR POTENTIAL REPURPOSING/PROCESS FLEXIBILITY.
3. MEMBRANE SPACING TO BE 48" O.C.
4. PROVIDE 24" CLEAR FROM CL MEMBRANE TO F.O. WALL
5. REMOVE EXISTING BASIN WALL AND REARRANGE UNITS.
6. CONCEPTUAL SEQUENCING:
   - CONSTRUCT NEW PROCESS BASINS
   - DIVERT FLOW INTO NEW BASINS, WHILE USING EXISTING MBR BASINS
   - CONSTRUCT NEW MBR BASIN
   - DIVERT FLOW INTO NEW MBR BASIN (NORTH)
   - UPGRADE EXISTING MBR BASIN (SOUTH)

NO	DATE	REVISION	BY	APVD

PRELIMINARY
NOT FOR CONSTRUCTION

DESIGN
DRAWN
CHECKED
APPROVED

WATERWORKS ENGINEERS
8650 ALAMEDA BLVD., NE, SUITE 103E ALBUQUERQUE, NM

NEW MEXICO WATER SERVICE COMPANY

RIO DEL ORO (RDO) SANITARY SEWER MASTER PLAN UPDATE

VALENCIA COUNTY, NEW MEXICO

GENERAL

PROCESS FLOW DIAGRAM
BUILD OUT 2050 IMPROVEMENTS

DATE: OCTOBER 2024
PROJECT NO.: 24-007
DRAWING NO.: PFD-BO
SHEET NO.: 4

Appendix D – Opinion of Probable Construction Cost

New Mexico Water Service Company — 1/2/2025

Rio Del Oro Sanitary Sewer System Master Plan Update — **Opinion of Probable Construction Cost**

Item	Existing Improvements	Subtotals	OPCC ($)*	$ per gal	$ per EDU	Priority Year
Influent Lift Station and Forcemain	Site Civil	$ -	$ 379,250	$ 1.90	$ 261	2025
	Structural and Mechanical	$ 183,000				
	Electrical, Instrumentation and Controls	$ 46,000				
Influent Screening	Site Civil	$ -	$ -	$ -	$ -	-
	Structural and Mechanical	$ -				
	Electrical, Instrumentation and Controls	$ -				
Biological Treatment	Site Civil	$ -	$ 1,860,000	$ 9.30	$ 1,278	2025
	Structural and Mechanical	$ 901,000				
	Electrical, Instrumentation and Controls	$ 226,000				
Disinfection	Site Civil	$ -	$ -	$ -	$ -	-
	Structural and Mechanical	$ -				
	Electrical, Instrumentation and Controls	$ -				
Effluent Pump Station	Site Civil	$ -	$ 123,500	$ 0.62	$ 85	2025
	Structural and Mechanical	$ 59,000				
	Electrical, Instrumentation and Controls	$ 15,000				
Solids Handling - Screw Press	Site Civil	$ -	$ -	$ -	$ -	-
	Structural and Mechanical	$ -				
	Electrical, Instrumentation and Controls	$ -				
Solids Handling - Sludge Thickening	Site Civil	$ -	$ -	$ -	$ -	-
	Structural and Mechanical	$ -				
	Electrical, Instrumentation and Controls	$ -				
Plant Electrical and Controls	Site Civil	$ -	$ -	$ -	$ -	-
	Structural and Mechanical	$ -				
	Electrical, Instrumentation and Controls	$ -				
Total Opinion of Probable Construction Costs			$ 2,362,750	$ 11.81	$ 1,624	-
Design, Permitting, and CM		**20%**	$ 472,550	$ 2.36	$ 325	-
Total Project Costs			$ 2,836,000	$ 14.18	$ 1,949	-

* Includes 25% design contingency, 25% contractor overhead, and 10% construction contingency.

WATERWORKS ENGINEERS

New Mexico Water Service Company

1/2/2025

Rio Del Oro Sanitary Sewer System Master Plan Update

Opinion of Probable Construction Cost

Item	Existing 2024 + Commited Improvements	Subtotals	OPCC ($)*	$ per added gal	$ per added EDU	Priority Year
Influent Lift Station and Forcemain	Site Civil	$ 117,000	$ 1,347,000	$ 19.24	$ 5,613	2025
	Structural and Mechanical	$ 559,000				
	Electrical, Instrumentation and Controls	$ 140,000				
Influent Screening	Site Civil	$ -	$ -	$ -	$ -	-
	Structural and Mechanical	$ -				
	Electrical, Instrumentation and Controls	$ -				
Biological Treatment	Site Civil	$ -	$ 2,041,875	$ 29.17	$ 8,508	2025
	Structural and Mechanical	$ 989,000				
	Electrical, Instrumentation and Controls	$ 248,000				
Disinfection	Site Civil	$ -	$ -	$ -	$ -	-
	Structural and Mechanical	$ -				
	Electrical, Instrumentation and Controls	$ -				
Effluent Pump Station	Site Civil	$ 69,000	$ 1,311,500	$ 18.74	$ 5,465	2025
	Structural and Mechanical	$ 580,000				
	Electrical, Instrumentation and Controls	$ 145,000				
Solids Handling - Screw Press	Site Civil	$ -	$ -	$ -	$ -	-
	Structural and Mechanical	$ -				
	Electrical, Instrumentation and Controls	$ -				
Solids Handling - Sludge Thickening	Site Civil	$ -	$ -	$ -	$ -	-
	Structural and Mechanical	$ -				
	Electrical, Instrumentation and Controls	$ -				
Plant Electrical and Controls	Site Civil	$ -	$ -	$ -	$ -	-
	Structural and Mechanical	$ -				
	Electrical, Instrumentation and Controls	$ -				
Collection System	-	$ -	$ -	$ -	$ -	-
	-	$ -				
Total Opinion of Probable Construction Costs			$ 4,700,375	$ 67.15	$ 19,585	-
Design, Permitting, and CM		**20%**	$ 940,075	$ 13.43	$ 3,917	-
Total Project Costs**			$ 5,641,000	$ 80.58	$ 23,502	-

* Includes 25% design contingency, 25% contractor overhead, and 10% construction contingency.

** Total Project Costs equals to $2.8M, $40/gal, and $11.7k/EDU, excluding the Existing capacity improvements.

New Mexico Water Service Company — 1/2/2025

Rio Del Oro Sanitary Sewer System Master Plan Update — **Opinion of Probable Construction Cost**

Item	Near-Term (2030) Improvements	Subtotals	OPCC ($)*	$ per added gal	$ per added EDU	Priority Year
Influent Lift Station and Forcemain	Site Civil	$ 117,000	$ 1,347,000	$ 5.61	$ 1,648.71	2030
	Structural and Mechanical	$ 559,000				
	Electrical, Instrumentation and Controls	$ 140,000				
Influent Screening	Site Civil	$ 89,000	$ 592,000	$ 2.47	$ 725	2030
	Structural and Mechanical	$ 215,000				
	Electrical, Instrumentation and Controls	$ 54,000				
Biological Treatment	Site Civil	$ 112,000	$ 3,555,000	$ 14.81	$ 4,351	2030
	Structural and Mechanical	$ 1,633,000				
	Electrical, Instrumentation and Controls	$ 409,000				
Disinfection	Site Civil	$ -	$ -	$ -	$ -	-
	Structural and Mechanical	$ -				
	Electrical, Instrumentation and Controls	$ -				
Effluent Pump Station	Site Civil	$ 780,000	$ 1,556,750	$ 6.49	$ 1,905	2030
	Structural and Mechanical	$ 130,000				
	Electrical, Instrumentation and Controls	$ 33,000				
Solids Handling - Screw Press	Site Civil	$ 38,000	$ 2,027,000	$ 8.45	$ 2,481	2030
	Structural and Mechanical	$ 952,000				
	Electrical, Instrumentation and Controls	$ 238,000				
Solids Handling - Sludge Thickening	Site Civil	$ 33,000	$ 429,000	$ 1.79	$ 525	Optional
	Structural and Mechanical	$ 207,000				
	Electrical, Instrumentation and Controls	$ 20,000				
Plant Electrical and Controls	Site Civil	$ -	$ -	$ -	$ -	-
	Structural and Mechanical	$ -				
	Electrical, Instrumentation and Controls	$ -				
Collection System	-	$ -	$ -	$ -	$ -	-
	-	$ -				
Total Opinion of Probable Construction Costs (Inclusive of Optional Items)			$ 9,506,750	$ 39.61	$ 11,636	-
Design, Permitting, and CM		**20%**	$ 1,901,350	$ 7.92	$ 2,327	-
Total Project Costs**			$ 11,409,000	$ 47.53	$ 13,963	-

* Includes 25% design contingency, 25% contractor overhead, and 10% construction contingency.

** Total Project Costs equals to $5.8M, $34/gal, and $10k/EDU, excluding the Existing+Committed improvements.

WATERWORKS ENGINEERS

New Mexico Water Service Company — 1/3/2025

Rio Del Oro Sanitary Sewer System Master Plan Update — **Opinion of Probable Construction Cost**

Item	Build Out (2050) Improvements	Subtotals	OPCC ($)*	$ per added gal	$ per added EDU	Priority Year
Influent Lift Station and Forcemain	Site Civil	$ -	$ 71,000	$ 0.11	$ 20.65	2050
	Structural and Mechanical	$ 33,000				
	Electrical, Instrumentation and Controls	$ 9,000				
Influent Screening	Site Civil	$ -	$ 363,000	$ 0.55	$ 106	2050
	Structural and Mechanical	$ 195,000				
	Electrical, Instrumentation and Controls	$ 25,000				
Biological Treatment	Site Civil	$ 153,000	$ 17,117,000	$ 25.93	$ 4,979	2050
	Structural and Mechanical	$ 8,176,000				
	Electrical, Instrumentation and Controls	$ 2,044,000				
Disinfection	Site Civil	$ -	$ 537,000	$ 0.81	$ 156	2050
	Structural and Mechanical	$ 260,000				
	Electrical, Instrumentation and Controls	$ 65,000				
Effluent Pump Station	Site Civil	$ -	$ 403,000	$ 0.61	$ 117	2050
	Structural and Mechanical	$ 195,000				
	Electrical, Instrumentation and Controls	$ 49,000				
Solids Handling - Screw Press	Site Civil	$ -	$ 3,333,000	$ 5.05	$ 969	2050
	Structural and Mechanical	$ 1,616,000				
	Electrical, Instrumentation and Controls	$ 404,000				
Solids Handling - Sludge Thickening	Site Civil	$ -	$ -	$ -	$ -	-
	Structural and Mechanical	$ -				
	Electrical, Instrumentation and Controls	$ -				
Plant Electrical and Controls	Site Civil	$ 50,000	$ 908,000	$ 1.38	$ 264	2050
	Structural and Mechanical	$ -				
	Electrical, Instrumentation and Controls	$ 500,000				
Collection System	SS-300	$ 5,243,250	$ 5,394,000	$ 8.17	$ 1,569	2050
	LS-3	$ 150,750				
Total Opinion of Probable Construction Costs			$ 28,126,000	$ 42.62	$ 8,181	-
Design, Permitting, and CM		**20%**	$ 5,625,200	$ 8.52	$ 1,636	-
Total Project Costs**			$ 33,752,000	$ 51.14	$ 9,817	-

* Includes 25% design contingency, 25% contractor overhead, and 10% construction contingency.

**Total Project Costs are in addition to the 2030 NT improvements.

REGION 6
1201 ELM STREET SUITE 500
DALLAS, TEXAS 75270

NPDES Permit No NM0027782

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et. seq; the "Act"),

New Mexico Water Service Company
Rio Communities WWTF
401 Horner Street
Rio Communities, NM 87002

is authorized to the Lower Peralta Riverside Drain, thence to the Rio Grande in Waterbody Segment Code No. 20.6.4.105 of the Rio Grande Basin from a facility located at 42 Chisum Trail, Rio Communities, Valencia County, New Mexico.

The discharge is located on that water at the following coordinates:

Outfall 001: Latitude 34° 37' 58" North and Longitude 106° 44' 29" West

in accordance with this cover page and the effluent limitations, monitoring requirements, and other conditions set forth in Part I, Part II, Part III, Part IV hereof.

This permit, prepared by Jim Afghani, Environmental Engineer, NPDES Permitting and Wetlands Section (6WDPE), supersedes and replaces NPDES Permit No. NM0027782 with an effective date of June 1, 2014.

This permit shall become effective on December 1, 2024

This permit and the authorization to discharge shall expire at midnight, November 30, 2029

Expires

Issued on October 31, 2024

TROY HILL Digitally signed by TROY HILL Date: 2024.10.31 15:24:45 -05'00'

Troy C. Hill, P.E.
Director
Water Division (6WD)

DOCUMENT ABBREVIATIONS

In the document that follows, various abbreviations are used. They are as follows:

4Q3	Lowest four-day average flow rate expected to occur once every three-years
BAT	Best available technology economically achievable
BCT	Best conventional pollutant control technology
BPT	Best practicable control technology currently available
BMP	Best management plan
BOD	Biochemical oxygen demand (five-day unless noted otherwise)
BPJ	Best professional judgment
CBOD	Carbonaceous biochemical oxygen demand (five-day unless noted otherwise)
CD	Critical dilution
CFR	Code of Federal Regulations
cfs	Cubic feet per second
COD	Chemical oxygen demand
COE	United States Corp of Engineers
CWA	Clean Water Act
DMR	Discharge monitoring report
ELG	Effluent limitation guidelines
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
FCB	Fecal coliform bacteria
FWS	United States Fish and Wildlife Service
mg/L	Milligrams per liter
ug/L	Micrograms per liter
lbs	Pounds
MGD	Million gallons per day
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMIP	New Mexico NPDES Permit Implementation Procedures
NMWQS	New Mexico State Standards for Interstate and Intrastate Surface Waters
NPDES	National Pollutant Discharge Elimination System
MQL	Minimum quantification level
O&G	Oil and grease
PFAS	Per- and Polyfluoroalkyl Substances
POTW	Publicly owned treatment works
RP	Reasonable potential
SS	Settleable solids
SIC	Standard industrial classification
s.u.	Standard units (for parameter pH)
SWQB	Surface Water Quality Bureau
TDS	Total dissolved solids
TMDL	Total maximum daily load
TRC	Total residual chlorine
TSS	Total suspended solids
UAA	Use attainability analysis
USGS	United States Geological Service
WLA	Waste load allocation
WET	Whole effluent toxicity
WQCC	New Mexico Water Quality Control Commission
WQMP	Water Quality Management Plan
WWTP	Wastewater treatment plan

In this document, references to State WQS and/or rules shall collectively mean the State of New Mexico.

PART I – REQUIREMENTS FOR NPDES PERMITS

Section A. LIMITATIONS AND MONITORING REQUIREMENTS

1. Final Effluent Limits – 0.3 MGD Design Flow During the period beginning the effective date of the permit and lasting until the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge to the Lower Peralta Riverside Drain, thence to Rio Grande in Waterbody Segment No. 20.6.4.105 of the Rio Grande Basin from Outfall 001. Such discharges shall be limited and monitored by the permittee as specified below:

Pollutant	Minimum	Maximum	Frequency	Type
pH	6.6	9.0	5/Week	Instantaneous Grab*4

Pollutant	30-day Average	7-day Average	30-day Average	7-day Average	Daily Maximum	Frequency	Type
Flow	Report MGD	Report MGD	N/A	N/A	N/A	Daily	Totalized
BOD5	50 lbs/day	75 lbs/day	20 mg/L	30 mg/L	N/A	2/Month	Grab
BOD5 Influent	Report	N/A	N/A	N/A	N/A	2/Month	Grab
BOD5 % Removal, Minimum	≥ 85%	NA	NA	NA	NA	1/Month	Calculation*2
TSS	75 lbs/day	113 lbs/day	30 mg/L	45 mg/L	N/A	2/Month	Grab
TSS Influent	Report	N/A	N/A	N/A	N/A	2/Month	Grab
TSS % Removal, Minimum	≥ 85%	NA	NA	NA	NA	1/Month	Calculation*2
E. coli Bacteria*8	1.43 cfu/100 ml or MPN/100 mL)	NA	126 cfu/100mL	NA	410 cfu/100mL	2/Month	Grab
DO, Minimum	N/A	N/A	N/A	N/A	5.0	5/Week	Instantaneous Grab*4
TRC	N/A	N/A	N/A	N/A	11 ug/L*3	5/Week	Instantaneous Grab*4
Temperature, (°C)	N/A	N/A	N/A	N/A	Report	5/Week	Instantaneous Grab*4

WHOLE EFFLUENT TOXICITY TESTING*5, (7-Day Static Renewal)	VALUE	FREQUENCY	Type
Ceriodaphnia dubia	Report	In 1st year*6	24-hr Composite
Pimephales promelas	Report	In 1st year*6	24-hr Composite

WHOLE EFFLUENT TOXICITY TESTING*7 (48-hr Acute Test)	VALUE	FREQUENCY	TYPE
Daphnia pulex (years: 2nd, 3rd, 4th, 5th)	Report	1/Year	24-hr Composite

EFFLUENT	30-DAY AVG	DAILY MAX	7-DAY AVG	30-DAY AVG	DAILY MAX	7-DAY AVG	FREQUENCY	TYPE
PFAS Analytes, Influent*9	N/A	N/A	N/A	N/A	Report ng/L*11	N/A	3/Permit Term	Grab
PFAS Analytes, Effluent*9	N/A	N/A	N/A	N/A	Report ng/L*11	N/A	3/Permit Term	Grab
PFAS Analytes, Sludge*10	N/A	N/A	N/A	N/A	Report ng/g*11	N/A	3/Permit Term	Grab

Footnotes:

1. See **Appendix A of Part II** of the permit for minimum quantification limits.

2. Percent removal is calculated using the following equation:
[average monthly influent concentration (mg/l) – average monthly effluent concentration (mg/l)] ÷ [average monthly influent concentration (mg/l)] x 100.
3. The effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes taken during periods of chlorine use.

4. Analyzed within 15 minutes of collection.

5. Monitoring and reporting requirements begin on the effective date of this permit. See Part II of the permit for WET testing requirements for additional WET monitoring and reporting conditions.

6. The test shall take place between November 1 and April 30; during the 1st year of the permit term or as soon as possible. EPA may reopen the permit if the test fails.

7. This 48-hr acute test is required if the 7-day chronic test pass in first year of the permit term. WET limits may be established where past monitoring indicates failure of WET tests, a likelihood of failure or where test results indicate effluent toxicity varies significantly over time.

8. Loading limit of billion (1.0×10^9) cfu/day. To calculate the load for any given day based on the facility's actual discharge flow, the formula is: {load [cfu/day] = concentration [cfu/100 mL] * flow [MGD] * 3.79×10^7 [conversion factor]}

9. Report in nanograms per liter (ng/L). This reporting requirement for the 40 PFAS parameters takes effect on the effective date of the authorization to discharge under the permit. Until there is an analytical method approved in 40 CFR Part 136 for PFAS in wastewater, monitoring shall be conducted using Method 1633. The Adsorbable Organic Fluorine CWA wastewater method 1621 can be used in conjunction with Method 1633, if appropriate. Additionally, report in NetDMR the results of all 40 PFAS analytes required to be tested as part of the method as shown in Appendix B of Part II.

10. Sludge sampling shall be Reported in nanograms per gram (ng/g). This reporting requirement for the 40 PFAS parameters takes effect on the effective date of the authorization to discharge under the permit. Until there is an analytical method approved in 40 CFR Part 136 for PFAS in sludge, monitoring shall be conducted using Method 1633. The Adsorbable Organic Fluorine CWA wastewater method 1621can be used in conjunction with Method 1633, if appropriate. Additionally, report in Net-DMR the results of all 40 PFAS analytes required to be tested as part of the method, as shown in Appendix B of Part Sludge sampling shall be as representative as possible based on guidance found at https://www.epa.gov/sites/production/files/2018-11/documents/potw-sludge-sampling-guidance-document.pdf.

11. PFAS samples must be collected and analyzed in three separate calendar years. PFAS Analysis data should be submitted annually to NMED (See Part III.D.IV) and NMENV-PFAS-DATA@env.nm.gov. The data submittal should include the electronic data deliverable and sampling narrative report provided by the analytical laboratory used to complete the analysis. NMED PFAS sampling standard operating procedures (SOPs) can be found at https://www.env.nm.gov/surface-water-quality/sop/.

2. FLOATING SOLIDS, VISIBLE FOAM AND/OR OILS

There shall be no discharge of floating solids or visible foam in other than trace amounts. There shall be no discharge of visible films of oil, globules of oil, grease or solids in or on the water, or coatings on stream banks.

3. SAMPLE LOCATION

Samples taken in compliance with the monitoring requirements specified above shall be taken at the discharge from the final treatment unit prior to the receiving stream. The sample point shall be clearly marked by the facility if it is not at the final outfall location. There shall be no flow from any source into the piping system after the sample point and prior to the final outfall.

B. SCHEDULES OF COMPLIANCE: None

C. MONITORING AND E- REPORTING (MINOR DISCHARGERS)

1. Applicable reports (DMRs, Biosolids/Sewage Sludge, Sewer Overflow/Bypass Event Pretreatment Program) shall be electronically reported to EPA at https://cdx.epa.gov/. The permittee may seek a waiver from electronic reporting or until approved for electronic reporting, the permittee shall first submit an electronic reporting waiver request to: U.S. EPA - Region 6, Water Enforcement Branch, New Mexico State Coordinator (6EN-WC), (214) 665-7179. If paper reporting is granted, the permittee shall submit reports on paper in accordance with signature and certification as required by Part III.D.11, and all other reports required by Part III.D. to the EPA and copies to NMED (under Part III.D.4 of the permit).

Applicable e-Reporting Program	e-Reporting Compliance Date	Frequency
DMRs	Permit effective date	Quarterly
Sewer Overflow/Bypass Event Reports and Anticipated Bypass Notices	By 21 December 2025	Quarterly

Discharge Monitoring Report (DMR) results shall be electronically reported to EPA per 40 CFR 127.16. To submit electronically, access the Net-DMR website at https://usepa.servicenowservices.com/oeca_icis?id=netdmr_homepage. Until approved for Net DMR, the permittee shall request temporary or emergency waivers from electronic reporting. To obtain the waiver, please contact: U.S. EPA - Region 6, Water Enforcement Branch, New Mexico State Coordinator (6EN-WC), (214) 665-6468. If paper reporting is granted temporarily, the permittee shall submit the original DMR signed and certified as required by Part III.D.11 and all other reports required by Part III.D. to the

EPA and copies to NMED as required (See Part III.D.IV of the permit). Reports shall be submitted quarterly.

1. Reporting periods shall end on the last day of the months March, June, September, and December.

2. The permittee is required to submit regular monthly reports as described above postmarked no later than the 28th day of the month following each reporting period.

3. NO DISCHARGE REPORTING: If there is no discharge at Outfall 001 during the sampling month, place an "X" in the NO DISCHARGE box located in the upper right corner of the Discharge Monitoring Report.

4. If any 7-day average or daily maximum value exceeds the effluent limitations specified in Part I.A, the permittee shall report the excursion in accordance with the requirements of Part III.D.

5. Any 30-day average, 7-day average, or daily maximum value reported in the required Discharge Monitoring Report which is in excess of the effluent limitation specified in Part I.A shall constitute evidence of violation of such effluent limitation and of this permit.

6. Other measurements of oxygen demand (e.g., TOC and COD) may be substituted for five-day Biochemical Oxygen Demand (BOD_5) or for five-day Carbonaceous Biochemical Oxygen Demand ($CBOD_5$), as applicable, where the permittee can demonstrate long-term correlation of the method with BOD_5 or $CBOD_5$ values, as applicable. Details of the correlation procedures used must be submitted and prior approval granted by the permitting authority for this procedure to be acceptable. Data reported must also include evidence to show that the proper correlation continues to exist after approval.

D. OVERFLOW REPORTING

The permittee shall report all overflows with the Discharge Monitoring Report submittal. These reports shall be summarized and reported in tabular format. The summaries shall include: the date, time, duration, location, estimated volume, and cause of the overflow; observed environmental impacts from the overflow; actions taken to address the overflow; and ultimate discharge location if not contained (e.g., storm sewer system, ditch, tributary).

Overflows that endanger health or the environment shall be orally reported at (214) 665-6595, and NMED Surface Water Quality Bureau at (505) 827-0187 or SWQ.Reporting@env.nm.gov (email preferred), within 24 hours from the time the permittee becomes aware of the circumstance. A written report of overflows that endanger health or the environment shall be provided to EPA and the NMED Surface Water Quality Bureau within 5 days of the time the permittee becomes aware of the circumstance.

E. POLLUTION PREVENTION REQUIREMENTS ?

The permittee shall institute a program within 12 months of the effective date of the permit (or continue an existing one) directed towards optimizing the efficiency and extending the useful life of the facility. The permittee shall consider the following items in the program:

a. The influent loadings, flow, and design capacity;
b. The effluent quality and plant performance;
c. The age and expected life of the wastewater treatment facility's equipment;
d. Bypasses and overflows of the tributary sewerage system and treatment works;

e. New developments at the facility;
f. Operator certification and training plans and status;
g. The financial status of the facility;
h. Preventative maintenance programs and equipment conditions and;
i. An overall evaluation of conditions at the facility.

PART II - OTHER CONDITIONS

A. MINIMUM QUANTIFICATION LEVEL (MQL)

EPA-approved test procedures (methods) for the analysis and quantification of pollutants or pollutant parameters, including for the purposes of compliance monitoring/DMR reporting, permit renewal applications, or any other reporting that may be required as a condition of this permit, shall be sufficiently sensitive.

A method is "sufficiently sensitive" when (1) the method minimum level (ML) of quantification is at or below the level of the applicable effluent limit for the measured pollutant or pollutant parameter; or (2) if there is no EPA-approved analytical method with a published ML at or below the effluent limit (see table below), then the method has the lowest published ML (is the most sensitive) of the analytical methods approved under 40 CFR Part 136 or required under 40 CFR Chapter I, Subchapters N or 0, for the measured pollutant or pollutant parameter; or (3) the method is specified in this permit or has been otherwise approved in writing by the permitting authority (EPA Region 6) for the measured pollutant or pollutant parameter. The Permittee has the option of developing and submitting a report to justify the use of matrix or sample specific MLs rather than the published levels. Upon written approval by EPA Region 6 the matrix or sample specific MLs may be utilized by the Permittee for all future Discharge Monitoring Report (DMR) reporting requirements.

Current EPA Region 6 minimum quantification levels (MQLs) for reporting and compliance are provided in Appendix A of Part II of this permit. The following pollutants may not have EPA approved methods with a published ML at or below the effluent limit, if specified:

POLLUTANT	CAS Number	STORET Code
Total Residual Chlorine	7782-50-5	50060
Cadmium	7440-43-9	01027
Silver	7440-22-4	01077
Thallium	7440-28-0	01059
Cyanide	57-12-5	78248
Dioxin (2,3,7,8-TCDD)	1764-01-6	34675
4, 6-Dinitro-0-Cresol	534-52-1	34657
Pentachlorophenol	87-86-5	39032
Benzidine	92-87-5	39120
Chrysene	218-01-9	34320
Hexachlorobenzene	118-74-1	39700
N-Nitrosodimethylamine	62-75-9	34438
Aldrin	309-00-2	39330
Chlordane	57-74-9	39350
Dieldrin	60-57-1	39380
Heptachlor	76-44-8	39410
Heptachlor epoxide	1024-57-3	39420
Toxaphene	8001-35-2	39400

Unless otherwise indicated in this permit, if the EPA Region 6 MQL for a pollutant or pollutant parameter is sufficiently sensitive (as defined above) and the analytical test result is less than the MQL, then a value of zero (0) may be used for reporting purposes on DMRs. Furthermore, if the EPA Region 6 MQL for a pollutant or parameter is not sufficiently sensitive, but the analytical test result is less than the published ML from a sufficiently sensitive method, then a value of zero (0) may be used for reporting purposes on DMRs.

B. 24-HOUR ORAL REPORTING: DAILY MAXIMUM LIMITATION VIOLATIONS

Under the provisions of Part III.D.7.b.(3) of this permit, violations of daily maximum limitations for the following pollutants shall be reported orally to EPA Region 6, Compliance and Assurance Division, Water Enforcement Branch (6EN-W), Dallas, Texas, and concurrently to NMED within 24 hours from the time the permittee becomes aware of the violation followed by a written report in five days: *E-coli* bacteria

C. PERMIT MODIFICATION AND REOPENER

In accordance with [40 CFR Part 122.44(c)], the permit may be reopened and modified during the life of the permit if relevant portions of New Mexico's Water Quality Standards for Interstate and Intrastate Streams are revised, or new State water quality standards are established and/or remanded by the New Mexico Water Quality Control Commission.

In accordance with [40 CFR Part 122.62(a)(2)], the permit may be reopened and modified if new information is received that was not available at the time of permit issuance that would have justified the application of different permit conditions at the time of permit issuance. Permit modifications shall reflect the results of any of these actions and shall follow regulations listed at [40 CFR Part 124.5].

D. WHOLE EFFLUENT TOXICITY LIMITS (7-DAY CHRONIC NOEC FRESHWATER)

It is unlawful and a violation of this permit for a permittee or his designated agent, to manipulate test samples in any manner, to delay sample shipment, or to terminate or to cause to terminate a toxicity test. Once initiated, all toxicity tests must be completed unless specific authority has been granted by EPA Region 6 or the State NPDES permitting authority.

1. SCOPE AND METHODOLOGY

a. The permittee shall test the effluent for toxicity in accordance with the provisions in this section.

APPLICABLE TO FINAL OUTFALL(S):	001
REPORTED ON DMR AS FINAL OUTFALL:	001
CRITICAL DILUTION (%):	100%
EFFLUENT DILUTION SERIES (%):	32%, 42%, 56%, 75%, 100%
COMPOSITE SAMPLE TYPE:	Defined at PART I
TEST SPECIES/METHODS:	40 CFR Part 136

Ceriodaphnia dubia chronic static renewal survival and reproduction test, Method 1002.0, EPA 821 R 02 013, or the most recent update thereof. This test should be terminated when 60% of the surviving females in the control produce three broods or at the end of eight days, whichever comes first.

Pimephales promelas (Fathead minnow) chronic static renewal 7-day larval survival and growth test, Method 1000.0, EPA 821 R 02 013 or the most recent update thereof. A minimum of five (5) replicates with eight (8) organisms per replicate must be used in the control and in each effluent dilution of this test.

b. The NOEC (No Observed Lethal Effect Concentration) is herein defined as the greatest effluent dilution at and below which lethality that is statistically different from the control (0% effluent) at the 95% confidence level does not occur. Chronic lethal test failure is defined as a demonstration of a statistically significant lethal effect at test completion to a test species at or below the critical dilution. Chronic sub-lethal test failure is defined as a demonstration of a statistically significant sub-lethal effect (i.e., growth or reproduction) at test completion to a test species at or below the critical dilution.

c. This permit may be reopened to require whole effluent toxicity limits, chemical specific effluent limits, additional testing, and/or other appropriate actions to address toxicity.

d. This permit does not establish requirements to automatically increase the WET testing frequency after a test failure, or to begin a toxicity reduction evaluation (TRE) in the event of multiple test failures. However, upon failure of any WET test, the permittee must report the test results to NMED and EPA, Surface Water Quality Bureau, and Water Division respectively, in writing, within 5 business days of notification the test failure. NMED and EPA will review the test results and determine the appropriate action necessary, if any.

2. REQUIRED TOXICITY TESTING CONDITIONS

a. Test Acceptance

The permittee shall repeat a test, including the control and all effluent dilutions, if the procedures and quality assurance requirements defined in the test methods or in this permit are not satisfied, including the following additional criteria:

- The toxicity test control (0% effluent) must have survival equal to or greater than 80%.
- The mean number of Ceriodaphnia dubia neonates produced per surviving female in the control (0% effluent) must be 15 or more.
- 60% of the surviving control females must produce three broods.
- The mean dry weight of surviving Fathead minnow larvae at the end of the 7 days in the control (0% effluent) must be 0.25 mg per larva or greater.
- The percent coefficient of variation between replicates shall be 40% or less in the control (0% effluent) for: the young of surviving females in the Ceriodaphnia dubia reproduction test; the growth and survival endpoints of the Fathead minnow test.
- The percent coefficient of variation between replicates shall be 40% or less in the critical dilution, unless significant lethal or nonlethal effects are exhibited for: the young of surviving females in the Ceriodaphnia dubia reproduction test; the growth and survival endpoints of the Fathead minnow test.
- A PMSD range of 13 - 47 for Ceriodaphnia dubia reproduction;
- A PMSD range of 12 - 30 for Fathead minnow growth.

Test failure may not be construed or reported as invalid due to a coefficient of variation value of greater than 40%. A repeat test shall be conducted within the required reporting period of any test determined to be invalid.

b. Statistical Interpretation

- For the Ceriodaphnia dubia survival test, the statistical analyses used to determine if there is a significant difference between the control and the critical dilution shall be Fisher's Exact Test as described in EPA/821/R-02-013 or the most recent update thereof.

- For the Ceriodaphnia dubia reproduction test and the Fathead minnow larval survival and growth test, the statistical analyses used to determine if there is a significant difference between the control and the critical dilution shall be in accordance with the methods for determining the No Observed Effect Concentration (NOEC) as described in EPA/821/R-02-013 or the most recent update thereof.

- If the conditions of Test Acceptability are met in Item 2.a above and the percent survival of the test organism is equal to or greater than 80% in the critical dilution concentration and all lower dilution concentrations, the test shall be considered to be a passing test, and the permittee shall report a survival NOEC of not less than the critical dilution for the DMR reporting requirements found in Item 3 below.

c. Dilution Water

- Dilution water used in the toxicity tests will be receiving water collected as close to the point of discharge as possible but unaffected by the discharge. The permittee shall substitute synthetic dilution water of similar pH, hardness, and alkalinity to the closest downstream perennial water for;

  - toxicity tests conducted on effluent discharges to receiving water classified as intermittent streams; and
  - toxicity tests conducted on effluent discharges where no receiving water is available due to zero flow conditions.

- If the receiving water is unsatisfactory as a result of instream toxicity (fails to fulfill the test acceptance criteria of Item 2.a), the permittee may substitute synthetic dilution water for the receiving water in all subsequent tests provided the unacceptable receiving water test met the following stipulations:

  - a synthetic dilution water control which fulfills the test acceptance requirements of Item 3.a was run concurrently with the receiving water control;
  - the test indicating receiving water toxicity has been carried out to completion (i.e., 7 days);
  - the permittee includes all test results indicating receiving water toxicity with the full report and information required by Item 3 below; and
  - the synthetic dilution water shall have a pH, hardness, and alkalinity similar to that of the receiving water or closest downstream perennial water not adversely affected by the discharge, provided the magnitude of these parameters will not cause toxicity in the synthetic dilution water.

d. Samples and Composites

- The permittee shall collect **two flow-weighted** samples from the outfall(s) listed at Item 1.a above.

- The permittee shall collect a second composite samples for use during the 24-hour renewal of each dilution concentration for both tests. The permittee must collect the grab samples so that the maximum holding time for any effluent sample shall not exceed 36 hours. The permittee must have initiated the toxicity test within 36 hours after the collection of the last portion of the first grab sample. Samples shall be chilled to 6 degrees Centigrade during collection, shipping, and/or storage.

- The permittee must collect the composite samples such that the effluent samples are representative of any periodic episode of chlorination, biocide usage or other potentially toxic substance discharged on an intermittent basis.

- If the flow from the outfall(s) being tested ceases during the collection of effluent samples, the requirements for the minimum number of effluent samples, the minimum number of effluent portions and

the sample holding time are waived during that sampling period. However, the permittee must collect an effluent composite sample volume during the period of discharge that is sufficient to complete the required toxicity tests with daily renewal of effluent. When possible, the effluent samples used for the toxicity tests shall be collected on separate days if the discharge occurs over multiple days. The effluent composite sample collection duration and the static renewal protocol associated with the abbreviated sample collection must be documented in the full report required in Item 3 of this section.

e. REPORTING

a. The permittee shall prepare a full report of the results of all tests conducted pursuant to this section in accordance with the Report Preparation Section of EPA/821/R-02-013, or the most current publication, for every valid or invalid toxicity test initiated whether carried to completion or not. The permittee shall retain each full report pursuant to the provisions of PART III.C.3 of this permit. The permittee shall submit full reports upon the specific request of the Agency. For any test which fails, is considered invalid or which is terminated early for any reason, the full report must be submitted for agency review.

b. A valid test for each species must be reported during each reporting period specified in PART I of this permit unless the permittee is performing a TRE which may increase the frequency of testing and reporting. Only ONE set of biomonitoring data for each species is to be recorded for each reporting period. The data submitted should reflect the LOWEST lethal and sub-lethal effects results for each species during the reporting period. All invalid tests, repeat tests (for invalid tests), and retests (for tests previously failed) performed during the reporting period must be attached for EPA review.

c. The permittee shall submit the results of each valid toxicity test as follows below. Submit retest information, if required, clearly marked as such. Only results of valid tests are to be reported.

- Pimephales promelas (Fathead Minnow)

  - If the No Observed Effect Concentration (NOEC) for survival is less than the critical dilution, enter a '1'; otherwise, enter a '0' for Parameter No. TLP6C
  - Report the NOEC value for survival, Parameter No. TOP6C
  - Report the LOEC value for survival, Parameter No. TXP6C
  - Report the NOEC value for growth, Parameter No. TPP6C
  - Report the LOEC value for growth, Parameter No. TYP6C
  - If the No Observed Effect Concentration (NOEC) for growth is less than the critical dilution, enter a '1'; otherwise, enter a '0' for Parameter No. TGP6C
  - Report the highest (critical dilution or control) Coefficient of Variation, Parameter No. TQP6C

- Ceriodaphnia dubia

  - If the NOEC for survival is less than the critical dilution, enter a '1'; otherwise, enter a '0' for Parameter No. TLP3B
  - Report the NOEC value for survival, Parameter No. TOP3B
  - Report the LOEC value for survival, Parameter No. TXP3B
  - Report the NOEC value for reproduction, Parameter No. TPP3B
  - Report the LOEC value for reproduction, Parameter No. TYP3B
  - If the No Observed Effect Concentration (NOEC) for reproduction is less than the critical dilution, enter a '1'; otherwise, enter a '0' for Parameter No. TGP3B
  - Report the higher (critical dilution or control) Coefficient of Variation, Parameter No. TQP3B

d. If retests are required by EPA, enter the following codes:

- For retest number 1, Parameter 22415, enter a '1' if the NOEC for survival is less than the critical dilution; otherwise, enter a '0'

- For retest number 2, Parameter 22416, enter a '1' if the NOEC for survival is less than the critical dilution; otherwise, enter a '0'

E. WHOLE EFFLUENT TOXICITY TESTING (48-HOUR ACUTE NOEC FRESHWATER)

1. SCOPE AND METHODOLOGY

a. The permittee shall test the effluent for toxicity in accordance with the provisions in this section.

APPLICABLE TO FINAL OUTFALL(S):	001
REPORTED ON DMR AS FINAL OUTFALL:	001
EFFLUENT DILUTION SERIES:	32%, 42%, 56%, 75%, and 100%
CRITICAL DILUTION:	100%
COMPOSITE SAMPLE TYPE:	Defined at PART I
TEST SPECIES/METHODS:	40 CFR Part 136

Daphnia pulex acute static renewal 48-hour definitive toxicity test using EPA 821 R 02 012 or the latest update thereof. A minimum of five (5) replicates with eight (8) organisms per replicate must be used in the control and in each effluent dilution of this test.

b. The NOEC (No Observed Lethal Effect Concentration) is defined as the greatest effluent dilution at and below which lethality that is statistically different from the control (0% effluent) at the 95% confidence level does not occur. Acute test failure is defined as a demonstration of a statistically significant lethal effect at test completion to a test species at or below the critical dilution.

c. This permit may be reopened to require whole effluent toxicity limits, chemical specific effluent limits, additional testing, and/or other appropriate actions to address toxicity.

d. Test failure is defined as a demonstration of statistically significant lethal effects to a test species at or below the effluent critical dilution.

e. This permit does not establish requirements to automatically increase the WET testing frequency after a test failure, or to begin a toxicity reduction evaluation (TRE) in the event of multiple test failures. However, upon failure of any WET test, the permittee must report the test results to NMED, Surface Water Quality Bureau, in writing, within 5 business days of notification the test failure. NMED will review the test results and determine the appropriate action necessary, if any.

2. REQUIRED TOXICITY TESTING CONDITIONS

a. Test Acceptance

The permittee shall repeat a test, including the control and all effluent dilutions, if the procedures and quality assurance requirements defined in the test methods or in this permit are not satisfied, including the following additional criteria:

- Each toxicity test control (0% effluent) must have a survival equal to or greater than 90%.

- The percent coefficient of variation between replicates shall be 40% or less in the control (0% effluent).

- The percent coefficient of variation between replicates shall be 40% or less in the critical dilution unless significant lethal effects are exhibited.

Test failure may not be construed or reported as invalid due to a coefficient of variation value of greater than 40%. A repeat test shall be conducted within the required reporting period of any test determined to be invalid.

b. Statistical Interpretation

The statistical analyses used to determine if there is a statistically significant difference between the control and the critical dilution shall be in accordance with the methods for determining the No Observed Effect Concentration (NOEC) as de-scribed in EPA 821 R 02 012 or the most recent update thereof.

If the conditions of Test Acceptability are met in Item 2.a above and the percent survival of the test organism is equal to or greater than 90% in the critical dilution concentration and all lower dilution concentrations, the test shall be considered to be a passing test, and the permittee shall report an NOEC of not less than the critical dilution for the reporting requirements found in Item 3 below.

c. Dilution Water

- Dilution water used in the toxicity tests will be receiving water collected as close to the point of discharge as possible but unaffected by the discharge. The permittee shall substitute synthetic dilution water of similar pH, hardness, and alkalinity to the closest downstream perennial water for;

  - toxicity tests conducted on effluent discharges to receiving water classified as intermittent streams; and
  - toxicity tests conducted on effluent discharges where no receiving water is available due to zero flow conditions.

- If the receiving water is unsatisfactory as a result of instream toxicity (fails to fulfill the test acceptance criteria of Item 2.a), the permittee may substitute synthetic dilution water for the receiving water in all subsequent tests provided the unacceptable receiving water test met the following stipulations:

  - a synthetic dilution water control which fulfills the test acceptance requirements of Item 3.a was run concurrently with the receiving water control;
  - the test indicating receiving water toxicity has been carried out to completion (i.e., 48 hours);
  - the permittee includes all test results indicating receiving water toxicity with the full report and information required by Item 3 below; and
  - the synthetic dilution water shall have a pH, hardness, and alkalinity similar to that of the receiving water or closest downstream perennial water not adversely affected by the discharge, provided the magnitude of these parameters will not cause toxicity in the synthetic dilution water.

d. Samples and Composites

- The permittee shall collect **two** flow-weighted composite samples from the outfall(s) listed at Item 1.a above.

- The permittee shall collect second composite samples for use during 24-hour renewals of each dilution concentration for each test. The permittee must collect the composite samples such that the effluent samples are representative of any periodic episode of chlorination, biocide usage or other potentially toxic substance discharged on an intermittent basis.

- The permittee must collect the composite samples so that the maximum holding time for any effluent sample shall not exceed **36 hours**. The permittee must have initiated the toxicity test within 36 hours after the collection of the last portion of the first composite sample. Samples shall be chilled to 6 degrees Centigrade during collection, shipping, and/or storage.

- If the flow from the outfall(s) being tested ceases during the collection of effluent samples, the requirements for the minimum number of effluent samples, the minimum number of effluent portions and the sample holding time are waived during that sampling period. However, the permittee must collect an effluent composite sample volume during the period of discharge that is sufficient to complete the required toxicity tests with daily renewal of effluent. When possible, the effluent samples used for the toxicity tests shall be collected on separate days. The effluent composite sample collection duration and the static renewal protocol associated with the abbreviated sample collection must be documented in the full report required in Item 3 of this section.

3. REPORTING

a. The permittee shall prepare a full report of the results of all tests conducted pursuant to this Part in accordance with the Report Preparation Section of EPA 821 R 02 012, for every valid or invalid toxicity test initiated, whether carried to completion or not. The permittee shall retain each full report pursuant to the provisions of PART III.C.3 of this permit. The permittee shall submit full reports upon the specific request of the Agency. For any test which fails, is considered invalid or which is terminated early for any reason, the full report must be submitted for agency review.

b. A valid test for each species must be reported during each reporting period specified in PART I of this permit unless the permittee is performing a TRE which may increase the frequency of testing and reporting. Only ONE set of biomonitoring data for each species is to be recorded for each reporting period. The data submitted should reflect the LOWEST Survival results for each species during the reporting period. All invalid tests, repeat tests (for invalid tests), and retests (for tests previously failed) performed during the reporting period must be attached for EPA review.

c. The permittee shall report the following results of each valid toxicity test. Submit retest information, if required, clearly marked as such. Only results of valid tests are to be reported.

Daphnia pulex

- If the NOEC for survival is less than the critical dilution, enter a "1"; otherwise, enter a "0" for Parameter No. TEM3D.

- Report the NOEC value for survival, Parameter No. TOM3D.

- Report the highest (critical dilution or control) Coefficient of Variation, Parameter No. TQM3D.

d. If retests are required by EPA, enter the following codes:

- For retest number 1, Parameter 22415, enter a "1" if the NOEC for survival is less than the critical dilution; otherwise, enter a "0."

- For retest number 2, Parameter 22416, enter a "1" if the NOEC for survival is less than the critical dilution; otherwise, enter a "0."

Region 6
1201 Elm Street, Suite 500
Dallas, Texas 75270

NPDES Permit No.
NM0030414

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et. seq; the "Act"),

Rio Del Oro Wastewater Treatment Facility
New Mexico Water Service Company
401 Horner Street
Belen, NM 87002

is authorized to discharge from the Rio Del Oro Wastewater Treatment Plant located at 1 PNM Access Road, Los Lunas in Section 26, Township 6 North Range 2 East, Valencia County, New Mexico, to the arroyo named La Canada de La Loma de Arena thence to La Constancia Ditch, thence to the Rio Grande in Segment 20.6.4.105 of the Rio Grande Basin, from a point located approximately

Outfall 001: Latitude 34° 43' 28.34" North, Longitude 106° 42' 21.46" West

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts I, II, III, and IV hereof.

This permit supersedes and replaces NPDES Permit No. NM0030414 with an effective date of February 1, 2015, and an expiration date of January 31, 2021.

This permit prepared by Ruben Alayon-Gonzalez, Environmental Engineer, Permitting Section (6WQ-PE) shall become effective on February 1, 2021

EXP. 125

This permit and the authorization to discharge shall expire at midnight, January 31, 2026

Issued on January 25, 2021

Charles Maguire

Charles W. Maguire
Director
Water Division (6WD)

DOCUMENT ABBREVIATIONS

In the document that follows, various abbreviations are used. They are as follows:

4Q3	lowest four-day average flow rate expected once every three years
Avg	Average
BAT	best available technology economically achievable
BCT	best conventional pollutant control technology
BPT	best practicable control technology currently available
BOD5	five-day biochemical oxygen demand
CFR	Code of Federal Regulations
cfs	cubic feet per second
cfu	colony forming units
COD	chemical oxygen demand
CWA	Clean Water Act
DMR	discharge monitoring report
EPA	United States Environmental Protection Agency
ft.	feet (measurement of distance)
FWS	United States Fish and Wildlife Service
lbs	pounds
Max	maximum
ug/L	micrograms per litter (one part per billion)
mg/L	milligrams per liter (one part per million)
MGD	million gallons per day
MQL	minimum qualification level
mpn	most probable number
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMIP	New Mexico NPDES permit implementation procedures
NMWQS	New Mexico state standards for interstate and intrastate surface waters
NPDES	national pollutant discharge elimination system
MQL	minimum quantification level
POTW	publically owned treatment works
s.u.	standard units (for parameter pH)
TDS	total dissolved solids
TMDL	total maximum daily load
TRC	total residual chlorine
TSS	total suspended solids
UAA	use attainability analysis
WET	whole effluent toxicity
WQCC	New Mexico Water Quality Control Commission
WQMP	water quality management plan
WWTP	wastewater treatment plant

PART I
A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS.

Table 1: Final Effluent limits – 0.3 MGD design flow

During the period beginning on the effective date of this permit and lasting through the expiration date of this permit, the permittee is authorized to discharge from outfall serial number 001. Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS					MONITORING REQUIREMENTS	
	lbs/day[5]		mg/l (unless noted)			Measurement Frequency	Sample Type
Parameter	30-Day Avg.	7-Day Avg.	30-Day Avg.	7-Day Avg.	Daily Max		
Flow	N/A	N/A	MGD	MGD	MGD	Continuous	Totalizer
BOD_5	75	113	30	45	***	2/Month	Grab[1]
TSS	75	113	30	45	***	2/Month	Grab[1]
Percent Removal (minimum), BOD_5	≥85%	***	***	***	***	1/Month	Calculation[2]
Percent Removal (minimum), TSS	≥85%	***	***	***	***	1/Month	Calculation[2]
E. coli Bacteria[4]	1.43×10^9 cfu/day	***	126	126	126	2/Month	Grab[1]
Total Residual Chlorine[6]	***	***	***	***	11µg/l	5/Week	Instant. Grab[3]

1. Monitoring must be conducted according to test procedures approved under 40CFR Part 136, unless other test procedures have been specified in this permit or approved by the Regional Administrator.
2. Percent removal is calculated using the following equation: [(average monthly influent concentration – average monthly effluent concentration) ÷ average monthly influent concentration] x 100.
3. Instantaneous grab a field measurement that is the analysis of a sample less than 15 minutes from the time of collection
4. Bacteria reporting units MUST be either cfu/100mL or MPN.
5. Loading in lbs/day = pollutant concentration in mg/L * 8.345 lbs/gal * design flow in MGD
6. When used as backup disinfectant, cleaning or doing maintenance work.

Table 2

Effluent Characteristics		Discharge Limitations			
		Standard Units		Monitoring Requirements	
Pollutant	STORET Code	Minimum	Maximum	Measurement Frequency	Sample Type
pH	00400	6.6	9.0	5/Week	Instantaneous Grab[1]

1. Instantaneous grab is a field measurement that is the analysis of a sample less than 15 minutes from the time of collection.

Table 3

Whole Effluent Toxicity Testing (7-Day Static Renewal)				
Effluent Characteristic	Discharge Monitoring		Monitoring Requirements	
	30-Day Average Min	7-Day Average Min	Frequency	Type
Cerodaphnia dubia	Report	Report	Once/5 Years	24-Hr. Composite
Pimephales promelas	Report	Report	Once/5 Years	24-Hr. Composite

1. Monitoring and reporting requirements begin on the effective date of this permit. See PART II, Whole Effluent Toxicity Testing Requirements for additional WET monitoring and reporting conditions.

2. FLOATING SOLIDS, VISIBLE FOAM AND/OR OILS

There shall be no discharge of floating solids or visible foam in other than trace amounts. There shall be no discharge of visible films of oil, globules of oil, grease or solids in or on the water, or coatings on stream banks.
Samples taken in compliance with the monitoring requirements specified above shall be taken at the discharge from the final treatment unit prior to the receiving stream. The sample point shall be clearly marked by the facility if it is not at the final outfall location. There shall be no flow from any source into the piping system after the sample point and prior to the final outfall.

B. SCHEDULES OF COMPLIANCE

None

C. MONITORING AND E- REPORTING (MINOR DISCHARGERS)

1. The permittee shall effectively monitor the operation and efficiency of all treatment and control facilities and the quantity and quality of the treated discharge.

2. Discharge Monitoring Report (DMR) results shall be electronically reported to EPA per 40 CFR 127.16. To submit electronically, access the NetDMR website at https://cdxnodengn.epa.gov/net-netdmr/. Until approved for Net DMR, the permittee shall request temporary or emergency waivers from electronic reporting. To obtain the waiver, please contact: U.S. EPA - Region 6, Water Enforcement Branch, New Mexico State Coordinator (6EN-WC), (214) 665-7179. If paper reporting is granted temporarily, the permittee shall submit the original DMR signed and certified as required by Part III.D.11 and all other reports required by Part III.D. to the EPA and copies to NMED as required (See Part III.D.IV of the permit).

   a. Monitoring information shall be submitted quarterly. Each quarterly submittal shall include separate forms for each month of the reporting period.

   b. Reporting periods shall end on the last day of the months March, June, September, and December.

   c. The permittee is required to submit regular quarterly reports as described above postmarked no later than the 28th day of the month following each reporting period.

3. If the permittee monitors any pollutant more frequently than required in Part I.A, the results of such monitoring shall be included in the calculation and reporting of the data submitted in the DMR, or the annual sludge report required in Part IV of the permit.

4. If any 30-day average, monthly average, 7-day average, weekly average, or daily maximum value exceeds the effluent limitations specified in Part I.A, the permittee shall report the excursion in accordance with the requirements of Part III.D.

5. Any 30-day average, monthly average, 7-day average, weekly average, or daily maximum value reported in the required DMR which is in excess of the effluent limitation specified in Part I.A shall constitute evidence of violation of such effluent limitation and of this permit.

6. Other measurements of oxygen demand (e.g., TOC and COD) may be substituted for five day Biochemical Oxygen Demand (BOD_5) or for five day Carbonaceous Biochemical Oxygen Demand ($CBOD_5$), as applicable, where the permittee can demonstrate long term correlation of the method with BOD_5 or $CBOD_5$ values, as applicable. Details of the correlation procedures used must be submitted and prior approval granted by the permitting authority for this procedure to be acceptable. Data reported must also include evidence to show that the proper correlation continues to exist after approval.

7. No discharge reporting.
If there is no discharge at Outfall 001 during the sampling month, place an X in the NO DISCHARGE box located in the upper right corner of the Discharge Monitoring Report.

D. OVERFLOW REPORTING

The permittee shall report all overflows with the Discharge Monitoring Report submittal. These reports shall be summarized and reported in tabular format. The summaries shall include: the date, time, duration, location, estimated volume, and cause of the overflow; observed environmental impacts from the overflow; actions taken to address the overflow; and ultimate discharge location if not contained (e.g., storm sewer system, ditch, tributary).

Overflows that endanger health or the environment shall be orally reported at (214) 665-6595, and NMED Surface Water Quality Bureau at (505) 827-0187, within 24 hours from the time the permittee becomes aware of the circumstance. A written report of overflows that endanger health or the environment shall be provided to EPA and the NMED Surface Water Quality Bureau within 5 days of the time the permittee becomes aware of the circumstance.

E. POLLUTION PREVENTION REQUIREMENTS ?

The permittee shall institute a program within 12 months of the effective date of the permit (or continue an existing one) directed towards optimizing the efficiency and extending the useful life of the facility. The permittee shall consider the following items in the program:

a. The influent loadings, flow and design capacity;
b. The effluent quality and plant performance;
c. The age and expected life of the wastewater treatment facility's equipment;
d. Bypasses and overflows of the tributary sewerage system and treatment works;
e. New developments at the facility;

f. Operator certification and training plans and status;
g. The financial status of the facility;
h. Preventative maintenance programs and equipment conditions and;
i. An overall evaluation of conditions at the facility.

PART II - OTHER CONDITIONS

A. MINIMUM QUANTIFICATION LEVEL (MQL)

EPA-approved test procedures (methods) for the analysis and quantification of pollutants or pollutant parameters, including for the purposes of compliance monitoring/DMR reporting, permit renewal applications, or any other reporting that may be required as a condition of this permit, shall be sufficiently sensitive. A method is "sufficiently sensitive" when (1) the method minimum level (ML) of quantification is at or below the level of the applicable effluent limit for the measured pollutant or pollutant parameter; or (2) if there is no EPA-approved analytical method with a published ML at or below the effluent limit (see table below), then the method has the lowest published ML (is the most sensitive) of the analytical methods approved under 40 CFR Part 136 or required under 40 CFR Chapter I, Subchapters N or 0, for the measured pollutant or pollutant parameter; or (3) the method is specified in this permit or has been otherwise approved in writing by the permitting authority (EPA Region 6) for the measured pollutant or pollutant parameter. The Permittee has the option of developing and submitting a report to justify the use of matrix or sample-specific MLs rather than the published levels. Upon written approval by EPA Region 6 the matrix or sample-specific MLs may be utilized by the Permittee for all future Discharge Monitoring Report (DMR) reporting requirements.

Current EPA Region 6 minimum quantification levels (MQLs) for reporting and compliance are provided in Appendix A of Part II of this permit. The following pollutants may not have EPA approved methods with a published ML at or below the effluent limit, if specified:

POLLUTANT	CAS Number	STORET Code
Total Residual Chlorine	7782-50-5	50060
Cadmium	7440-43-9	01027
Silver	7440-22-4	01077
Thallium	7440-28-0	01059
Cyanide	57-12-5	78248
Dioxin (2,3,7,8-TCDD)	1764-01-6	34675
4, 6-Dinitro-0-Cresol	534-52-1	34657
Pentachlorophenol	87-86-5	39032
Benzidine	92-87-5	39120
Chrysene	218-01-9	34320
Hexachlorobenzene	118-74-1	39700
N-Nitrosodimethylamine	62-75-9	34438
Aldrin	309-00-2	39330
Chlordane	57-74-9	39350
Dieldrin	60-57-1	39380
Heptachlor	76-44-8	39410
Heptachlor epoxide	1024-57-3	39420
Toxaphene	8001-35-2	39400

Unless otherwise indicated in this permit, if the EPA Region 6 MQL for a pollutant or pollutant

parameter is sufficiently sensitive (as defined above) and the analytical test result is less than the MQL, then a value of zero (0) may be used for reporting purposes on DMRs. Furthermore, if the EPA Region 6 MQL for a pollutant or parameter is not sufficiently sensitive, but the analytical test result is less than the published ML from a sufficiently sensitive method, then a value of zero (0) may be used for reporting purposes on DMRs.

B. CONTRIBUTING INDUSTRIES AND PRETREATMENT REQUIREMENTS

1. The following pollutants may not be introduced into the treatment facility:

   a. Pollutants which create a fire or explosion hazard in the publicly owned treatment works (POTW), including, but not limited to, wastestreams with a closed cup flashpoint of less than 140 degrees Fahrenheit or 60 degrees Centigrade using the test methods specified in 40 CFR 261.21;

   b. Pollutants which will cause corrosive structural damage to the POTW, but in no case discharges with pH lower than 5.0, unless the works are specifically designed to accommodate such discharges;

   c. Solid or viscous pollutants in amounts which will cause obstruction to the flow in the POTW, resulting in Interference;

   d. Any pollutant, including oxygen demanding pollutants (e.g., BOD), released in a discharge at a flow rate and/or pollutant concentration which will cause Interference with the POTW;

   e. Heat in amounts which will inhibit biological activity in the POTW resulting in Interference but in no case heat in such quantities that the temperature at the POTW treatment plant exceeds 40 degrees Centigrade (104 degrees Fahrenheit) unless the Approval Authority, upon request of the POTW, approves alternate temperature limits;

   f. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;

   g. Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity that may cause acute worker health and safety problems; and

   h. Any trucked or hauled pollutants, except at discharge points designated by the POTW.

2. The permittee shall require any indirect discharger to the treatment works to comply with the reporting requirements of Sections 204(b), 307, and 308 of the Act, including any requirements established under 40 CFR Part 403.

3. The permittee shall provide adequate notice of the following:

   a. Any new introduction of pollutants into the treatment works from an indirect discharger which would be subject to Sections 301 and 306 of the Act if it were directly discharging those pollutants

   b. Any substantial change in the volume or character of pollutants being introduced into the treatment works by a source introducing pollutants into the treatment works at the time of issuance of the permit.

   c. Any notice shall include information on (i) the quality and quantity of effluent to be introduced into the treatment works, and (ii) any anticipated impact of the change on the quality or quantity of effluent to be discharged from the POTW.

C. 24-HOUR ORAL REPORTING: DAILY MAXIMUM LIMITATION VIOLATIONS

Under the provisions of Part III.D.7.b.(3) of this permit, violations of daily maximum limitations for the following pollutants shall be reported orally to EPA Region 6, Compliance and Assurance Division, Water Enforcement Branch (6EN-W), Dallas, Texas, and concurrently to NMED within 24 hours from the time the permittee becomes aware of the violation followed by a written report in five days.

- E. coli and TRC

Twenty-four hour reporting:

(i) The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A report shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The report shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times), and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. For noncompliance events related to combined sewer overflows, sanitary sewer overflows, or bypass events, these reports must include the data described above (with the exception of time of discovery) as well as the type of event (combined sewer overflows, sanitary sewer overflows, or bypass events), type of sewer overflow structure (e.g., manhole, combine sewer overflow outfall), discharge volumes untreated by the treatment works treating domestic sewage, types of human health and environmental impacts of the sewer overflow event, and whether the noncompliance was related to wet weather. As of December 21, 2020 all reports related to combined sewer overflows, sanitary sewer overflows, or bypass events submitted in compliance with this

section must be submitted electronically by the permittee to the Director or initial recipient, as defined in 40 CFR 127.2(b), in compliance with this section and 40 CFR part 3 (including, in all cases, subpart D to part 3), § 122.22, and 40 CFR part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of part 127, permittees may be required to electronically submit reports related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section by a particular permit or if required to do so by state law. The Director may also require permittees to electronically submit reports not related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section.

(ii) The following shall be included as information which must be reported within 24 hours under this paragraph.

(A) Any unanticipated bypass which exceeds any effluent limitation in the permit. (See § 122.41(g).

(B) Any upset which exceeds any effluent limitation in the permit.

(C) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in the permit to be reported within 24 hours. (See § 122.44(g).)

D. PERMIT MODIFICATION AND REOPENER

In accordance with [40 CFR Part 122.44(d)], the permit may be reopened and modified during the life of the permit if relevant portions of New Mexico's Water Quality Standards for Interstate and Intrastate Streams are revised, or new State water quality standards are established and/or remanded by the New Mexico Water Quality Control Commission.

In accordance with [40 CFR Part 122.62(s)(2)], the permit may be reopened and modified if new information is received that was not available at the time of permit issuance that would have justified the application of different permit conditions at the time of permit issuance. Permit modifications shall reflect the results of any of these actions and shall follow regulations listed at [40 CFR Part 124.5].

E. WHOLE EFFLUENT TOXICITY TESTING (7-Day Chronic Test)

It is unlawful and a violation of this permit for a permittee or his designated agent, to manipulate test samples in any manner, to delay sample shipment, or to terminate or to cause to terminate a toxicity test. Once initiated, all toxicity tests must be completed unless specific authority has been granted by EPA Region 6 or the State NPDES permitting authority.

1. SCOPE AND METHODOLOGY

a. The permittee shall test the effluent for toxicity in accordance with the provisions in this section.

APPLICABLE TO FINAL OUTFALL(S):	001
REPORTED ON DMR AS FINAL OUTFALL:	001
CRITICAL DILUTION (%):	100%
EFFLUENT DILUTION SERIES (%):	32%, 42%, 56%, 75%, 100%
COMPOSITE SAMPLE TYPE:	Defined at PART I
TEST SPECIES/METHODS:	40 CFR Part 136

Ceriodaphnia dubia chronic static renewal survival and reproduction test, Method 1002.0, EPA 821 R 02 013, or the most recent update thereof. This test should be terminated when 60% of the surviving females in the control produce three broods or at the end of eight days, whichever comes first.

Pimephales promelas (Fathead minnow) chronic static renewal 7-day larval survival and growth test, Method 1000.0, EPA 821 R 02 013 or the most recent update thereof. A minimum of five (5) replicates with eight (8) organisms per replicate must be used in the control and in each effluent dilution of this test.

a. The NOEC (No Observed Lethal Effect Concentration) is herein defined as the greatest effluent dilution at and below which lethality or sublethality that is statistically different from the control (0% effluent) at the 95% confidence level does not occur. Chronic lethal test failure is defined as a demonstration of a statistically significant lethal effect at test completion to a test species at or below the critical dilution. Chronic sub-lethal test failure is defined as a demonstration of a statistically significant sub-lethal effect (i.e., growth or reproduction) at test completion to a test species at or below the critical dilution.

b. This permit may be reopened to require whole effluent toxicity limits, chemical specific effluent limits, additional testing, and/or other appropriate actions to address toxicity.

1. REQUIRED TOXICITY TESTING CONDITIONS

a. Test Acceptance

The permittee shall repeat a test, including the control and all effluent dilutions, if the procedures and quality assurance requirements defined in the test methods or in this permit are not satisfied, including the following additional criteria:

- The toxicity test control (0% effluent) must have survival equal to or greater than 80%.
- The mean number of Ceriodaphnia dubia neonates produced per surviving female in the control (0% effluent) must be 15 or more.
- 60% of the surviving control females must produce three broods.
- The mean dry weight of surviving Fathead minnow larvae at the end of the 7 days in the control (0% effluent) must be 0.25 mg per larva or greater.
- The percent coefficient of variation between replicates shall be 40% or less in the control (0% effluent) for: the young of surviving females in the Ceriodaphnia dubia reproduction test; the growth and survival endpoints of the Fathead minnow test.
- The percent coefficient of variation between replicates shall be 40% or less in the critical dilution, unless significant lethal or nonlethal effects are exhibited for: the young of surviving females in the Ceriodaphnia dubia reproduction test; the growth and survival endpoints of the Fathead minnow test.
- A PMSD range of 13 - 47 for Ceriodaphnia dubia reproduction;
- A PMSD range of 12 - 30 for Fathead minnow growth.

Test failure may not be construed or reported as invalid due to a coefficient of variation value of greater than 40%. A repeat test shall be conducted within the required reporting period of any test determined to be invalid.

b. Statistical Interpretation

- For the Ceriodaphnia dubia survival test, the statistical analyses used to determine if there is a significant difference between the control and the critical dilution shall be Fisher's Exact Test as described in EPA/821/R-02-013 or the most recent update thereof.
- For the Ceriodaphnia dubia reproduction test and the Fathead minnow larval survival and growth test, the statistical analyses used to determine if there is a significant difference between the control and the critical dilution shall be in accordance with the methods for determining the No Observed Effect Concentration (NOEC) as described in EPA/821/R-02-013 or the most recent update thereof.

- If the conditions of Test Acceptability are met in Item 2.a above and the percent survival of the test organism is equal to or greater than 80% in the critical dilution concentration and all lower dilution concentrations, the test shall be considered to be a passing test, and the permittee shall report a survival NOEC of not less than the critical dilution for the DMR reporting requirements found in Item 3 below.

c. Dilution Water

- Dilution water used in the toxicity tests will be receiving water collected as close to the point of discharge as possible but unaffected by the discharge. The permittee shall substitute synthetic dilution water of similar pH, hardness, and alkalinity to the closest downstream perennial water for;

  - toxicity tests conducted on effluent discharges to receiving water classified as intermittent streams; and

  - toxicity tests conducted on effluent discharges where no receiving water is available due to zero flow conditions.

- If the receiving water is unsatisfactory as a result of instream toxicity (fails to fulfill the test acceptance criteria of Item 2.a), the permittee may substitute synthetic dilution water for the receiving water in all subsequent tests provided the unacceptable receiving water test met the following stipulations:

  - a synthetic dilution water control which fulfills the test acceptance requirements of Item 3.a was run concurrently with the receiving water control;

  - the test indicating receiving water toxicity has been carried out to completion (i.e., 7 days);

  - the permittee includes all test results indicating receiving water toxicity with the full report and information required by Item 3 below; and

  - the synthetic dilution water shall have a pH, hardness, and alkalinity similar to that of the receiving water or closest downstream perennial water not adversely affected by the discharge, provided the magnitude of these parameters will not cause toxicity in the synthetic dilution water.

d. Samples and Composites

- The permittee shall collect a minimum of three flow-weighted composite samples from the outfall(s) listed at Item 1.a above.

- The permittee shall collect a second and third composite samples for use during the 24-hour renewal of each dilution concentration for the tests. The permittee must collect the composite samples so that the maximum holding time for any effluent sample shall not exceed 72 hours. The permittee must have initiated the toxicity test within 36 hours after the collection of the last portion of the first composite sample. Samples shall be chilled to 6 degrees Centigrade during collection, shipping, and/or storage.

- The permittee must collect the composite samples such that the effluent samples are representative of any periodic episode of chlorination, biocide usage or other potentially toxic substance discharged on an intermittent basis.

- If the flow from the outfall(s) being tested ceases during the collection of effluent samples, the requirements for the minimum number of effluent samples, the minimum number of effluent portions and the sample holding time are waived during that sampling period. However, the permittee must collect an effluent composite sample volume during the period of discharge that is sufficient to complete the required toxicity tests with daily renewal of effluent. When possible, the effluent samples used for the toxicity tests shall be collected on separate days if the discharge occurs over multiple days. The effluent composite sample collection duration and the static renewal protocol associated with the abbreviated sample collection must be documented in the full report required in Item 3 of this section.

2. REPORTING

a. The permittee shall prepare a full report of the results of all tests conducted pursuant to this section in accordance with the Report Preparation Section of EPA/821/R-02-013, or the most current publication, for every valid or invalid toxicity test initiated whether carried to completion or not. The permittee shall retain each full report pursuant to the provisions of PART III.C.3 of this permit. The permittee shall submit full reports upon the specific request of the Agency. For any test which fails, is considered invalid or which is terminated early for any reason, the full report must be submitted for agency review.

b. A valid test for each species must be reported during each reporting period specified in PART I of this permit unless the permittee is performing a TRE which may increase the frequency of testing and reporting.

c. The permittee shall submit the results of each valid toxicity test as follows below. Submit retest information, if required, clearly marked as such. Only results of valid tests are to be reported.

- Pimephales promelas (Fathead Minnow)
  - ➢ If the No Observed Effect Concentration (NOEC) for survival is less than the critical dilution, enter a '1'; otherwise, enter a '0' for Parameter No. TLP6C
  - ➢ Report the NOEC value for survival, Parameter No. TOP6C
  - ➢ Report the LOEC value for survival, Parameter No. TXP6C
  - ➢ Report the NOEC value for growth, Parameter No. TPP6C
  - ➢ Report the LOEC value for growth, Parameter No. TYP6C
  - ➢ If the No Observed Effect Concentration (NOEC) for growth is less than the critical dilution, enter a '1'; otherwise, enter a '0' for Parameter No. TGP6C
  - ➢ Report the highest (critical dilution or control) Coefficient of Variation, Parameter No. TQP6C
- Ceriodaphnia dubia
  - ➢ If the NOEC for survival is less than the critical dilution, enter a '1'; otherwise, enter a '0' for Parameter No. TLP3B
  - ➢ Report the NOEC value for survival, Parameter No. TOP3B
  - ➢ Report the LOEC value for survival, Parameter No. TXP3B
  - ➢ Report the NOEC value for reproduction, Parameter No. TPP3B
  - ➢ Report the LOEC value for reproduction, Parameter No. TYP3B
  - ➢ If the No Observed Effect Concentration (NOEC) for reproduction is less than the critical dilution, enter a '1'; otherwise, enter a '0' for Parameter No. TGP3B
  - ➢ Report the higher (critical dilution or control) Coefficient of Variation, Parameter No. TQP3B

d. If retests are required by NMED, enter the following codes:

- For retest number 1, Parameter 22415, enter a '1' if the NOEC for the lethal or sublethal endpoint is less than the critical dilution; otherwise, enter a '0'

- For retest number 2, Parameter 22416, enter a '1' if the NOEC for the lethal or sublethal endpoint is less than the critical dilution; otherwise, enter a '0'

- For retest number 3, Parameter 51443, enter a '1' if the NOEC for the lethal or sublethal endpoint is less than the critical dilution; otherwise, enter a '0'

4. PERSISTENT TOXICITY

The requirements of this subsection apply only when a toxicity test demonstrates significant lethal and/or sub-lethal effects at or below the critical dilution. Significant toxic effects, are herein defined as a statistically significant difference at the 95% confidence level between the survival, growth or reproduction of the appropriate test organism in a specified effluent dilution and the control (0% effluent). If the initial WET test conducted fails, the permittee will conduct three retest. The purpose of retests is to determine the duration of a toxic event. A test that meets all test acceptability criteria and demonstrates significant toxic effects does not need additional confirmation. Such testing cannot confirm or disprove a previous test result. If any valid test demonstrates significant lethal and/or sub-lethal effects to a test species at or below the critical dilution, the frequency of testing for this species is automatically increased to once per quarter with no option for frequency reduction.

a. Part I Testing Frequency Other than Monthly

The permittee shall conduct a total of three (3) additional tests for any species that demonstrates significant lethal effects at or below the critical dilution. The three additional tests shall be conducted monthly during the next three consecutive months. If testing on a quarterly basis, the permittee may substitute one of the additional tests in lieu of one routine toxicity test. A full report shall be prepared for each test required by this section in accordance with the procedures outlines in Item 3 of this section and submitted with the period discharge monitoring report (DMR) to the permitting authority for review.

b. If persistent lethality is demonstrated by failure of one or more retest, the permittee shall initiate Toxicity Reduction Evaluation (TRE) requirements as specified in Item 6 of this section. If persistent sub-lethality is demonstrated by failure of two or more retest, the permittee shall initiate Toxicity Reduction Evaluation (TRE) requirements. The permittee shall notify EPA in writing within 5 days of the failure of any retest, and the TRE initiation date will be the test completion date of the first failed retest for lethal TREs or second failed retest for sub-lethal TREs. A TRE may also be required due to a demonstration of intermittent lethal effects at or below the critical dilution, or for failure to perform the required retests. The provisions of Item 5.a are suspended upon submittal of the TRE Action Plan.

5. TOXICITY REDUCTION EVALUATION (TRE)

a. Within ninety (90) days of confirming lethality and/or sub-lethality in the retests, the permittee shall submit a Toxicity Reduction Evaluation (TRE) Action Plan and Schedule for conducting a TRE to the EPA WET Coordinator at 6WQ-PO. The TRE Action Plan shall specify the approach and methodology to be used in performing the TRE. A Toxicity Reduction Evaluation is an investigation intended to determine those actions necessary to achieve compliance with water quality based effluent limits by reducing an effluent's toxicity to an acceptable level. A TRE is defined as a step wise process which combines toxicity testing and analyses of the physical and chemical characteristics of a toxic effluent to identify the constituents causing effluent toxicity and/or treatment methods which will reduce the effluent toxicity. The TRE Action Plan shall lead to the successful elimination of effluent toxicity at the critical dilution and include the following:

i. Specific Activities. The plan shall detail the specific approach the permittee intends to utilize in conducting the TRE. The approach may include toxicity characterizations, identifications and confirmation activities, source evaluation, treatability studies, or alternative approaches. When the permittee conducts Toxicity Characterization Procedures the permittee shall perform multiple characterizations and follow the procedures specified in the documents "Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures" (EPA 600/6-91/003) or alternate procedures. When the permittee conducts Toxicity Identification Evaluations and Confirmations, the permittee shall perform multiple identifications and follow the methods specified in the documents "Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity" (EPA/600/R-92/080) and "Methods for Aquatic Toxicity Identification Evaluations, Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity" (EPA/600/R-92/081), as appropriate.

ii. Sampling Plan (e.g., locations, methods, holding times, chain of custody, preservation, etc.). The effluent sample volume collected for all tests shall be adequate to perform the toxicity test, toxicity characterization, identification and confirmation procedures, and conduct chemical specific analyses when a probable toxicant has been identified; Where the permittee has identified or suspects specific pollutant(s) and/or source(s) of effluent toxicity, the permittee shall conduct, concurrent with toxicity testing, chemical specific analyses for the identified and/or suspected pollutant(s) and/or source(s) of effluent toxicity. Where toxicity was demonstrated within 24 hours of test initiation, each composite sample shall be analyzed independently. Otherwise the permittee may substitute a composite sample, comprised of equal portions of the individual composite samples, for the chemical specific analysis;

iii. Quality Assurance Plan (e.g., QA/QC implementation, corrective actions, etc.); and

iv. Project Organization (e.g., project staff, project manager, consulting services, etc.).

b. The permittee shall initiate the TRE Action Plan within thirty (30) days of plan and schedule submittal.

c. The permittee shall submit a quarterly TRE Activities Report, with the Discharge Monitoring Report in the months of January, April, July and October, containing information on toxicity reduction evaluation activities including:

i. any data and/or substantiating documentation which identifies the pollutant(s) and/or source(s) of effluent toxicity;
ii. any studies/evaluations and results on the treatability of the facility's effluent toxicity; and
iii. any data which identifies effluent toxicity control mechanisms that will reduce effluent toxicity to the level necessary to meet no significant toxicity at the critical dilution. A copy of the TRE Activities Report shall also be submitted to the state agency.

d. The permittee shall submit a Final Report on Toxicity Reduction Evaluation Activities no later than twenty-eight (28) months from confirming toxicity in the retests, which provides information pertaining to the specific control mechanism selected that will, when implemented, result in reduction of effluent toxicity to no significant toxicity at the critical dilution. The report will also provide a specific corrective action schedule for implementing the selected control mechanism. A copy of the Final Report on Toxicity Reduction Evaluation Activities shall also be submitted to the state agency.

e. Quarterly testing during the TRE is a minimum monitoring requirement. EPA recommends that permittees required to perform a TRE not rely on quarterly testing alone to ensure success in the TRE, and that additional screening tests be performed to capture toxic samples for identification of toxicants. Failure to identify the specific chemical compound causing toxicity test failure will normally result in a permit limit for whole effluent toxicity limits per federal regulations at 40 CFR 122.44(d)(1)(v).

6. MONITORING FREQUENCY REDUCTION

a. The permittee may apply for a testing frequency reduction upon the successful completion of the first four consecutive quarters of testing for a test species, with no lethal or sub-lethal effects demonstrated at or below the critical dilution. If granted, the monitoring frequency for that test species may be reduced to not less than once per year

for the less sensitive species (usually the Fathead minnow) and not less than twice per year for the more sensitive test species (usually the Ceriodaphnia dubia).

b. Certification - The permittee must certify in writing that no test failures have occurred and that all tests meet all test acceptability criteria above. In addition, the permittee must provide a list with each test performed including test initiation date, species, NOECs for lethal effects and the maximum coefficient of variation for the controls. Upon review and acceptance of this information the agency will issue a letter of confirmation of the monitoring frequency reduction. A copy of the letter will be forwarded to the agency's Permit Compliance System section to update the permit reporting requirements.

c. Failures - If any test demonstrates lethal or sub-lethal effects at or below the critical dilution at any time during the life of this permit, three monthly retests are required. If a frequency reduction had been granted, the monitoring frequency for the affected test species reverts to once per quarter until the permit is re-issued. Monthly retesting is not required if the permittee is performing a TRE.

d. This monitoring frequency reduction applies only until the expiration date of this permit, at which time the monitoring frequency for both test species reverts to once per quarter until the permit is re-issued.