SANTA ANA WATERSHED PROJECT AUTHORITY

Inland Empire Brine Line Data Management System Request for Proposal

PA 24 Committee
Agenda Item No. 6.C
Lucas Gilbert
Manager of Permitting and Pretreatment
February 4, 2025

Recommendation

- That the Project Agreement 24 Committee direct staff to release an RFP for Data Management System Software for the Inland Empire Brine Line Pretreatment Program.

Pretreatment Program Summary

- SAWPA is the OC San’s Delegated Control Authority for the Pretreatment Program in the Brine Line service area
- SAWPA administers the program along with its Member Agencies (4) and contract agencies (4)

Pretreatment Program Organization

Pretreatment Program Summary

- SAWPA, along with the Agencies, permit 49 industrial facilities that discharge to the Brine Line along with an additional 8 Liquid Waste Haulers

Permits	Number
Direct	33
Indirect	16
Liquid Waste Hauler	8
Total	**57**

Pretreatment Program Summary

Monitoring and Inspections	Number
Sampling Events	412
Parameters Sampled	310
Analytical Results	12,621
Inspections	165

- Regulatory oversite of these permitted facilities include sampling of the discharge to the Brine Line and inspection of each facility.

- All of these regulatory functions develop a considerable amount of records that must be stored properly to ensure adequate access and security.
- Since July 1, 2024, around 1,200 documents have been created by the pretreatment program.

Document Management System - iPACS

- Since July 1, 2014, SAWPA has employed a software called iPACS.
- SAWPA and Agency staff use iPACS to create tasks, manage pretreatment items, and upload and store records for each task for ready access by all appropriate staff.
  - 24 active users across SAWPA and the Agencies use iPACS for the Brine Line Pretreatment Program

Document Management System - iPACS

- iPACS was developed on the Microsoft.Net framework, which is being sun-setted by Microsoft in December of 2025.
- iPACS will no longer be supported by Microsoft and therefore can no longer be employed as the Brine Line Database Management System (DMS).
- To ensure continued support of the pretreatment program a new DMS software needs to be selected and implemented before December 2025.

Document Management System - RFP

Technical Specifications

- DMS software must be accessible remotely through the Internet by the agencies.
- DMS software will have improvements to streamline data entry demands of SAWPA and agency staff with CROMERR certification to allow for electronic reporting of pretreatment submittals.
- Provide software development and configuration
- Install and test the application
- Provide training and documentation
- Provide ongoing technical support.

Tentative Schedule

Tentative Schedule:

Issue RFP	February 4, 2025
Receive Proposals	March 13, 2025
Contract Award	April 2025
Implement Use of Software	October 1, 2025

Recommendation

- That the Project Agreement 24 Committee direct staff to release an RFP for Data Management System Software for the Inland Empire Brine Line Pretreatment Program.

Questions?

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Inland Empire Brine Line Master Plan

David Ruhl, Executive Manager of Engineering and Operations

PA 24 Committee Meeting

February 4, 2025

SANTA ANA WATERSHED PROJECT AUTHORITY

Purpose and Objectives

Master Plan Purpose and Objectives

Purpose

- Management and implementation of needed improvements that support ongoing growth and expansion of the Brine Line, and best serves SAWPA, it's Member Agencies, and Brine Line dischargers
- Address infrastructure needs to convey and manage increasingly higher salinity discharges, as well as address increasing regulatory requirements

Objectives

- Identify the regional market for brine management needs
- Evaluate the capacity of the Brine Line system
- Develop system improvements to address identified deficiencies
- Identify capacity management activities that may be implemented to maximize regional use of the Brine Line
- Include identified projects and studies in Brine Line CIP and 2- year budget as appropriate and implement based on infrastructure needs and market conditions (increased flows)

SANTA ANA WATERSHED PROJECT AUTHORITY

Report Organization

Master Plan Report Organization

- **Market Assessment & Future Flow Projections**
  - Summarizes ownership capacities, anticipated growth in the Brine Line service area, and discharger loadings used to develop existing and future capacity analysis scenarios.
- **Hydraulic Model Update & Calibration**
  - Describes updates to and calibration of the exiting Brine Line hydraulic model to recent (June 2023) flow monitoring data
- **Brine Line System Capacity Analysis**
  - Presents the results of the capacity analyses performed on the Brine Line system under existing, near-term, long-term, buildout, and ownership discharge conditions
- **Capacity Management & Long-Term Planning Efforts**
  - Summarizes potential long-term initiatives to improve management and performance of the Brine Line system, including reliability and redundancy analyses, real-time data collection, and brine minimization. Also addresses current and anticipated PFAS regulations and PFAS treatment options for the Brine Line system.
- **Brine Line Multi-Use Benefits**
  - Describes how the Brine Line system is a multi-use benefit to the entire Santa Ana Watershed, enabling groundwater desalination, advanced recycled water treatment, industrial non-reclaimable water disposal, and a variety of other community-wide benefits
- **Future Facilities, Improvements & Expansion**
  - Presents a prioritized list of recommended Brine Line improvement projects and their estimated costs, organized into a 10-year CIP

SANTA ANA WATERSHED PROJECT AUTHORITY

Market Analysis and Future Flow Projections

Market Analysis and Future Flow Projections

Member Agency / Stakeholder Meetings

Date	Agency
February 23, 2023	**San Bernardino Valley Municipal Water District**
February 23, 2023	San Bernardino Municipal Water Department
February 23, 2023	City of Redlands
February 23, 2023	East Valley Water District
March 8, 2023	**Eastern Municipal Water District**
March 16, 2023	**Western Municipal Water District**
March 30, 2023	**Inland Empire Utilities Agency**
March 19, 2023	Chino Basin Desalter Authority
May 4, 2023	City of Corona
June 12, 2023	Elsinore Valley Municipal Water District
June 15, 2023	Jurupa Community Services District
June 15, 2023	Yucaipa Valley Water District
June 21, 2023	City of Colton
June 22, 2023	Riverside County Flood Control District
July 13, 2023	City of Beaumont
August 16, 2023	City of Chino
August 17, 2023	Temescal Valley Water District
August 17, 2023	City of Riverside
August 24, 2023	Rubidoux Community Services District
February 28, 2024	Rancho California Water District

Market Analysis and Future Flow Projections

Discharge Projections by Flow Type

Flow Type	Flow Monitoring June 2023		Near – Term 2024 - 2033		Long – Term 2034 - 2048		Build – Out >2048	
Water Supply Desalting	10.1	74%	11.6	62%	16.9	63%	19.1	59%
Wastewater Desalting	1.0	7%	4.5	24%	5.9	22%	7.2	22%
Industrial	1.7	12%	1.9	10%	2.3	9%	2.9	9%
Power Generation	0.5	4%	0.6	3%	.6	2%	0.7	2%
Dry Weather Flow	0.0	0%	0.0	0%	1.0	4%	2.0	7%
Commercial	0.3	2%	0.3	2%	0.3	1%	0.4	1%
Total	**13.5 MGD**		**18.8 MGD**		**27.0 MGD**		**32.3 MGD**	

Market Analysis and Future Flow Projections

Potential Projects and Discharge Amount by Agency

Future Brine Line Discharger / Project	Discharge Amount (gpd)
EMWD	
Perris II Desalter Expansion	900,000
Ranch California Water District	2,000,000
Industrial	125,000
IEUA	
Chino Basin Program / New Industrial	150,000
Intertie with NRS	Undefined
SBVMWD	
YVWD	1,161,000
Regional Recycled Water Facilities Project	1,550,000
Industrial	100,000
WMWD	
Rubidoux CSD Desalter Facility	2,000,000
Riverside County Flood Control District DWF	2,000,000
Elsinore Valley MWD IPR	1,200,000
Temescal Valley Water District IPR	225,000
Temescal Desalter	250,000
JCSD Desalter	4,000,000
City of Riverside Recycled Water Desalination Plant	1,000,000
Industrial	160,000

Market Analysis and Future Flow Projections

Key information / concerns (1 of 2)

- Ownership capacity:

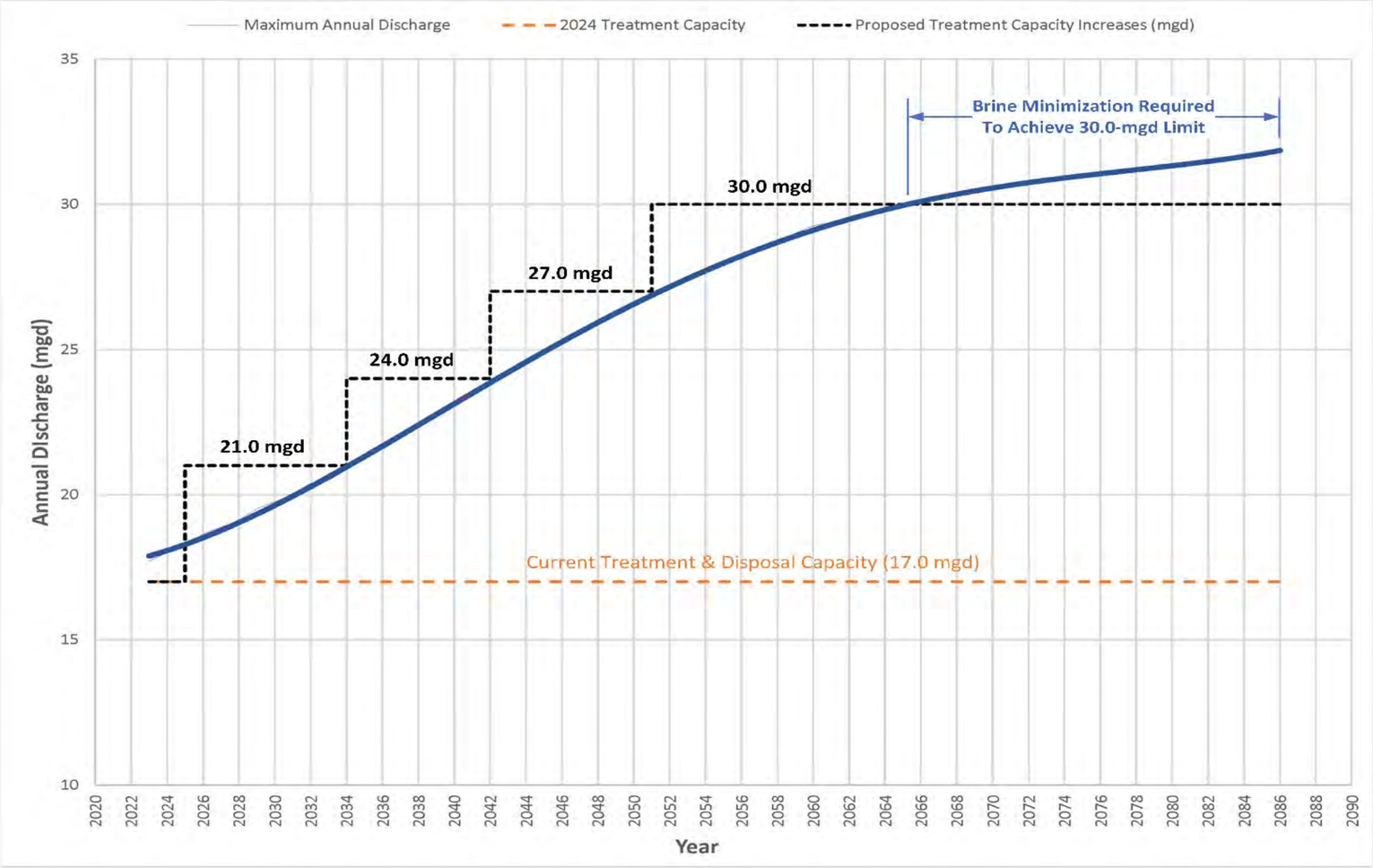
Agency	Current Ave Flows (mgd)	Current Max Flows (mgd)	Treatment and Disposal Capacity (mgd)	Pipeline Capacity (mgd)	Projected Future Need (mgd)
CDA	3.35	3.67	3.35	3.670	3.67
EMWD	3.53	4.04	3.548*	5.946	7.0
IEUA	0.48	1.61	2.25	4.130	1.1
SBVMWD	1.56	2.02	1.639	7.738	4.8
WMWD	4.60	6.42	6.213	11.084	15.7
Total	**13.52**	**17.75**	**17.0**	**32.568**	**32.27**

* EMWD leases 0.5 MGD of T&D capacity for a total T&D Capacity of 4.048 mgd

- Capacity Management
  - Dischargers need to manage discharges more consistently and not exceed maximum flows
  - Future growth in 2 Member Agency services areas expected to exceed their purchased capacity

Market Research and Future Flow Projections

Key information / concerns (2 of 2)



Future investments:

Treatment and disposal capacity purchases will be needed in 2026, 2034, 2042, and 2051

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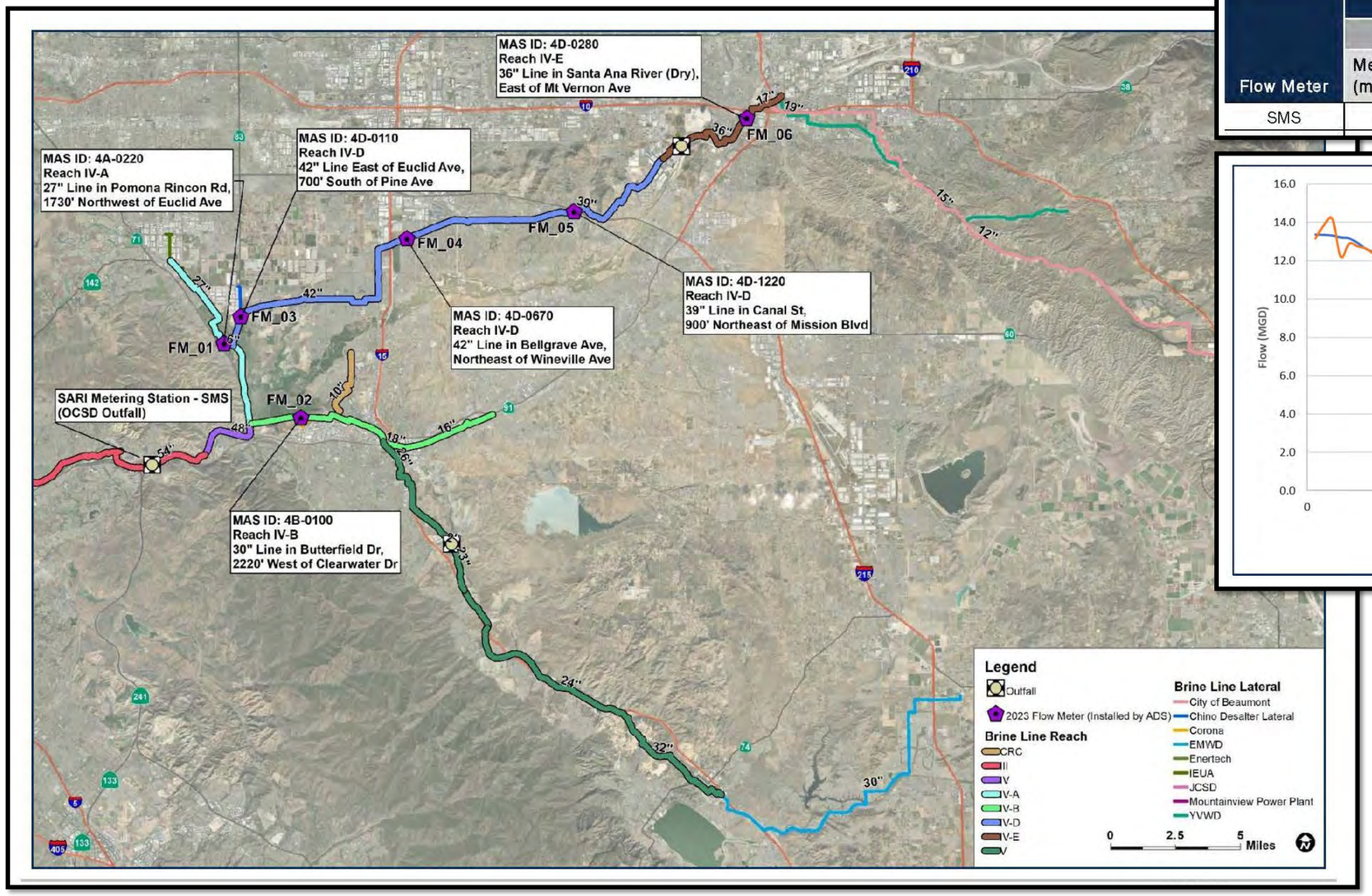
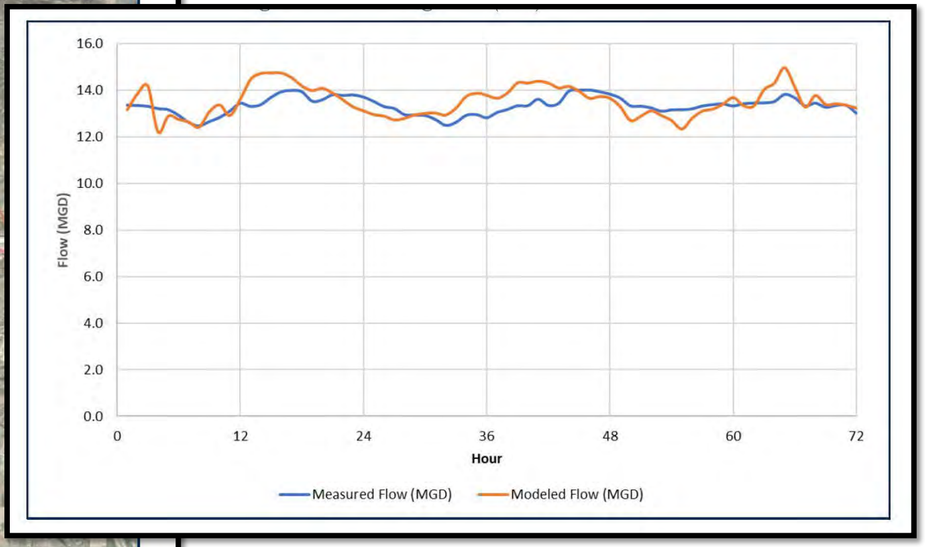
Hydraulic Model Development and Calibration

Hydraulic Model Development and Calibration



Flow Meter	Calibration Results					
	Average Flows			Peak Flows		
	Measured (mgd)	Modeled (mgd)	% Diff	Measured (mgd)	Modeled (mgd)	% Diff
SMS	13.34	13.53	1.4	14.02	14.99	6.9



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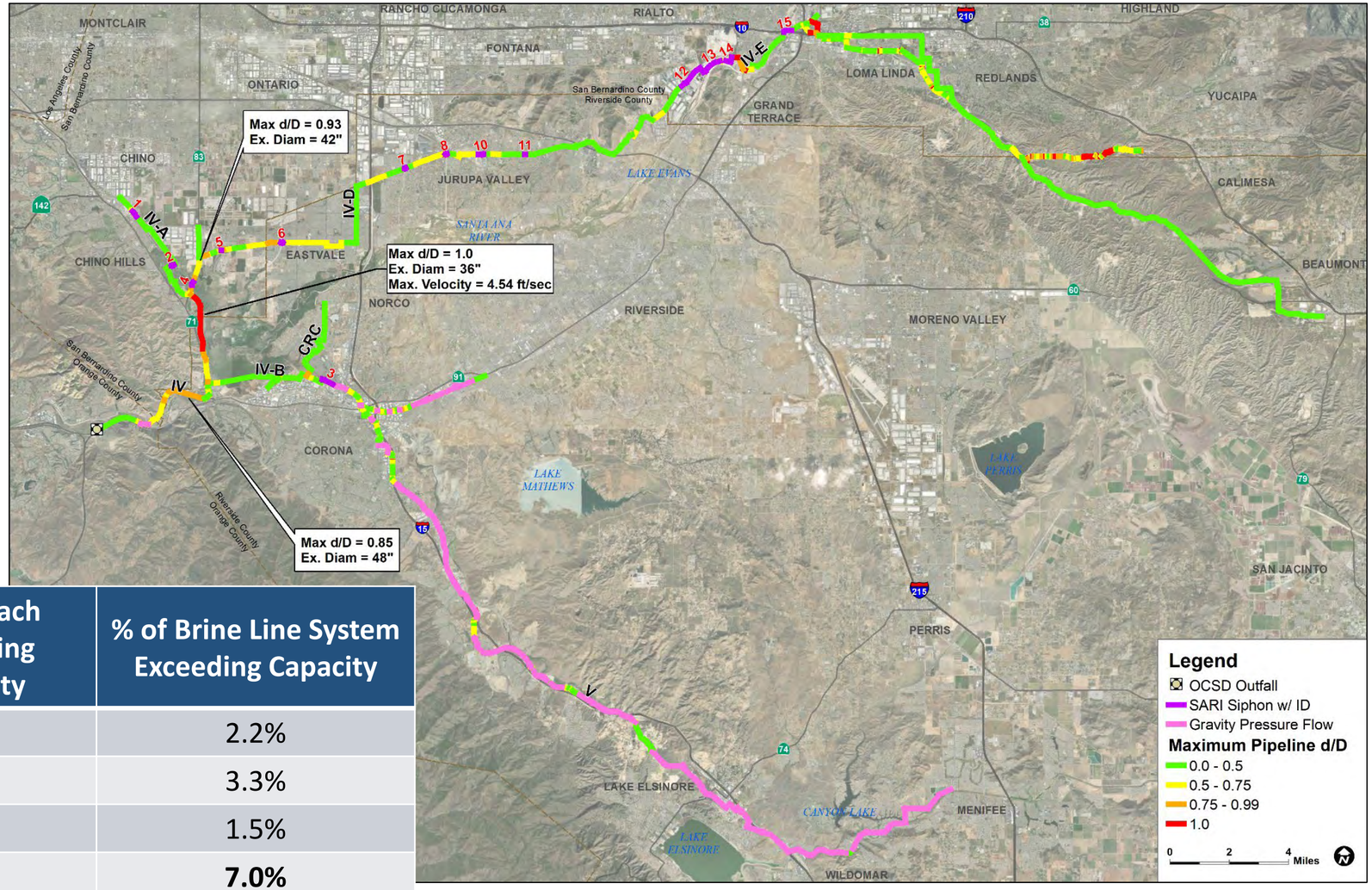
Brine Line System Capacity Analysis

Brine Line System Capacity Analysis

Build-out Maximum Discharge Scenario – Max Pipeline d/D



Reach	Segment Exceeding Capacity (ft)	% of Reach Exceeding Capacity	% of Brine Line System Exceeding Capacity
Reach IV	8,250	53%	2.2%
Reach IV-A	12,600	77%	3.3%
Reach IV-D	5,850	5%	1.5%
Total (All Reaches)	**26,750**		**7.0%**

Brine Line Capacity Analysis
Anticipated improvements to address findings

- Potential infrastructure improvements due to higher flows identified on Reach IV, Reach IV – A lower (Prado inundation area) and Reach IV-D
- Implement smart manhole covers for real-time monitoring of critical segments to proactively manage and mitigate potential overflows and system failures
- Implement SCADA system for real-time monitoring of each discharger's flow to resolve capacity exceedance issues

ID	Project	Planning Scenario	Cost Estimate	Benefits			Funding		
				Capacity	O&M	Regulatory	Rates	Reserves	Loan/Grant
CAP-1	Reach IV Parallel Pipeline (Below Prado). Construct a 10,200 LF, 30-inch parallel line.	Build-out (Beyond 2048)	$19,520,000	x		X		x	x
CAP-2	Reach IV-A Pipeline Relocation (Prado). Replace 18,000 LF of existing 36-inch pipe with 48-inch pipe.	Build-out (Beyond 2048)	$55,114,000	x		x		x	x
CAP-3	Reach IV-D Parallel Pipeline (City of Chino). Construct a 5,9000 LF, 36-inch parallel line.	Build-out (Beyond 2048)	$13,526,500	X		x		x	x
FM-2	Smart MAS Covers. Install smart covers at 6 locations.	Near-Term (2025-2034)	$175,000	X	x	x		x	

SANTA ANA WATERSHED PROJECT AUTHORITY

Capacity Management and Long-Term Planning Efforts

Capacity Management and Long-Term Planning Efforts

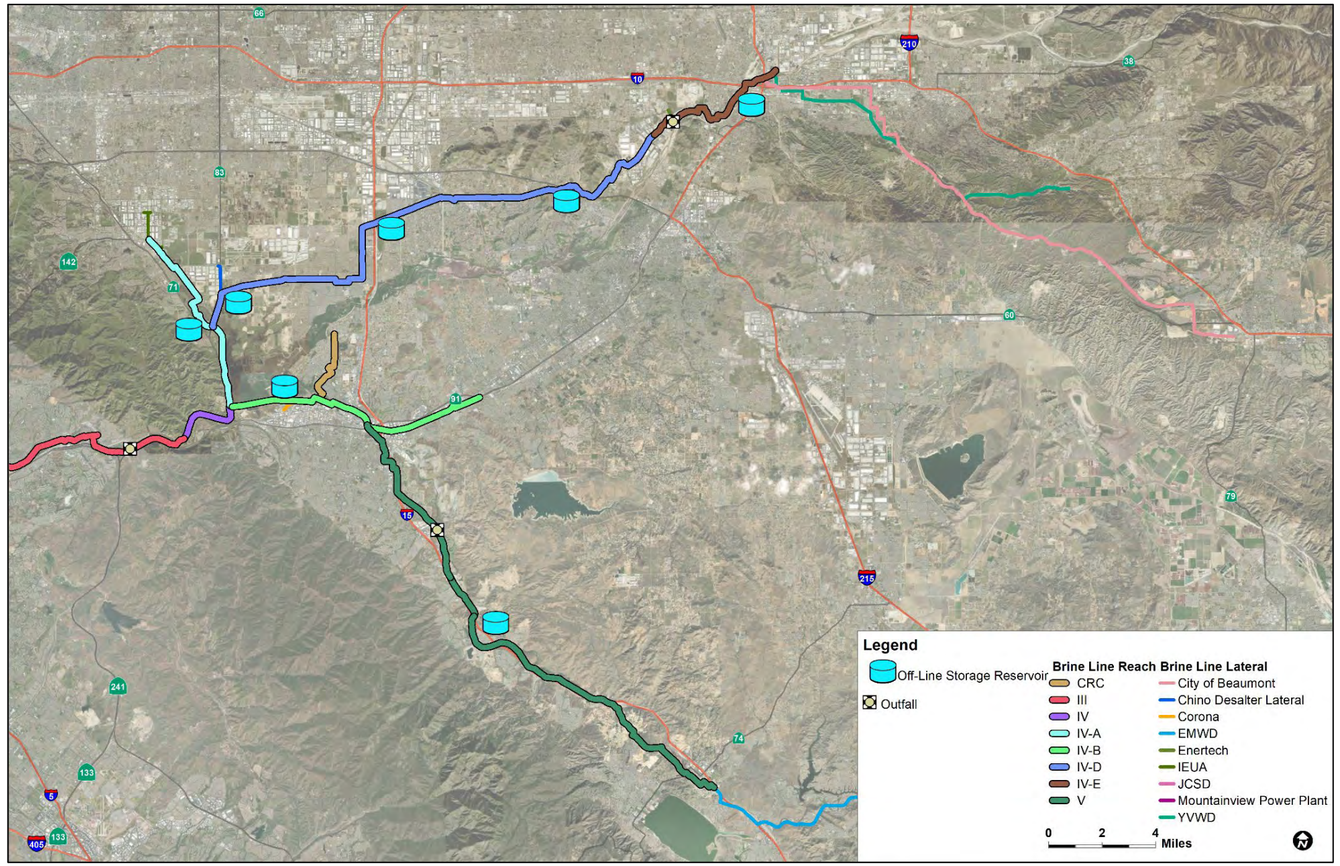
- Summarizes potential long-term initiatives to improve management and performance of the Brine Line system
  - Reliability and redundancy analyses
  - Enhanced monitoring and control
  - Brine minimization
  - Anticipated PFAS regulations

Capacity Management and Long-Term Planning Efforts
Reliability and Redundancy – Off-line Storage (1 of 3)

Project Description

- Seven (7) reservoirs, capable of storing a minimum 8 – hours of Brine Line flow at Build-out
- Extended storage capacity during earlier planning horizons (21 – hours at current conditions and 16 – hours at near-term conditions)

Reach	Build-out 8 hrs of flow (MG)	Recommended Sizing (MG)
IV-A	0.24	0.5
IV-B and V	3.48	4.0 (2 at 2 MG)
IV-D	1.88	2.0
IV-D	1.89	2.0
IV-D	1.16	2.0
IV-E	1.51	2.0
Total	10.16	12.5



Capacity Management and Long-Term Planning Efforts
Reliability and Redundancy – Off-line Storage (2 of 3)

Benefits

- Improve system reliability and reduce impacts on dischargers during outages
- Facilitate Brine Line shutdowns for maintenance, system improvements, evaluation or potentially system failure
- Provide additional system capabilities, such as capturing DWF, supporting brine minimization efforts and green hydrogen production
- Extended storage capacity during earlier planning horizons (21 – hours at current conditions and 16 – hours at near-term conditions)
- Manage peak flows
- Reduce impacts to public and environment in the event of a Brine Line Spill

Capacity Management and Long-Term Planning Efforts
Reliability and Redundancy – Off-line Storage (3 of 3)

Implementation

- Future study to more thoroughly assess the feasibility of the proposed off-line storage concept

ID	Project	Planning Scenario	Cost Estimate	Benefits			Funding		
				Capacity	O&M	Regulatory	Rates	Reserves	Loan/Grant
FM-1	Off-line Storage Feasibility Study	Near-Term (FY 26 & FY 27)	$190,000	x	x	x	x		
CAP-4	Off-line Storage. Construct six 2 MG and one 0.5 MG off-line storage reservoirs	Near / Long-Term (2032-2048)	$109,278,000	x	x	x		x	x

Capacity Management and Long-Term Planning Efforts
Enhanced Monitoring and Control – SCADA System (1 of 3)

Project Description

- SCADA System (Real-time flow and quality data collection) to provide remote, automated flow and water quality data collection
- Data collection and transmittal devices installed at each discharger location and at each in-line flow monitoring location

Phase	Description of Work
1	Construction and installation of Master Station, operator workstation, setup, integration of programming and automation
2	Construction and installation of first 12 discharger sites with the highest flow
3	Construction and installation of next 12 discharger sites with medium flow
4	Construction and installation of last 12 discharger sites with low flow
5	Construction and installation of up to five (5) in-line flow monitoring stations

Capacity Management and Long-Term Planning Efforts
Enhanced Monitoring and Control – SCADA System (2 of 3)

Benefits

- Increase ability to monitor, operate and control the Brine Line system
- Reducing staff time
- Improving compliance efforts by recording potential discharge violations and facilitating future pretreatment enforcement
- Understanding of each discharger's flow and strength characteristics will allow for a more equitable distribution of costs between dischargers
- Allow for ability to resolve capacity exceedance issues
- Allows for maintenance of the Brine Line hydraulic model
- Identify potential Inflow and Infiltration

Capacity Management and Long-Term Planning Efforts
Enhanced Monitoring and Control – SCADA System (3 of 3)

Implementation

- Initiate Work Plan to develop the technical specifications, identify work area requirements, refine the cost estimate and phasing of the work

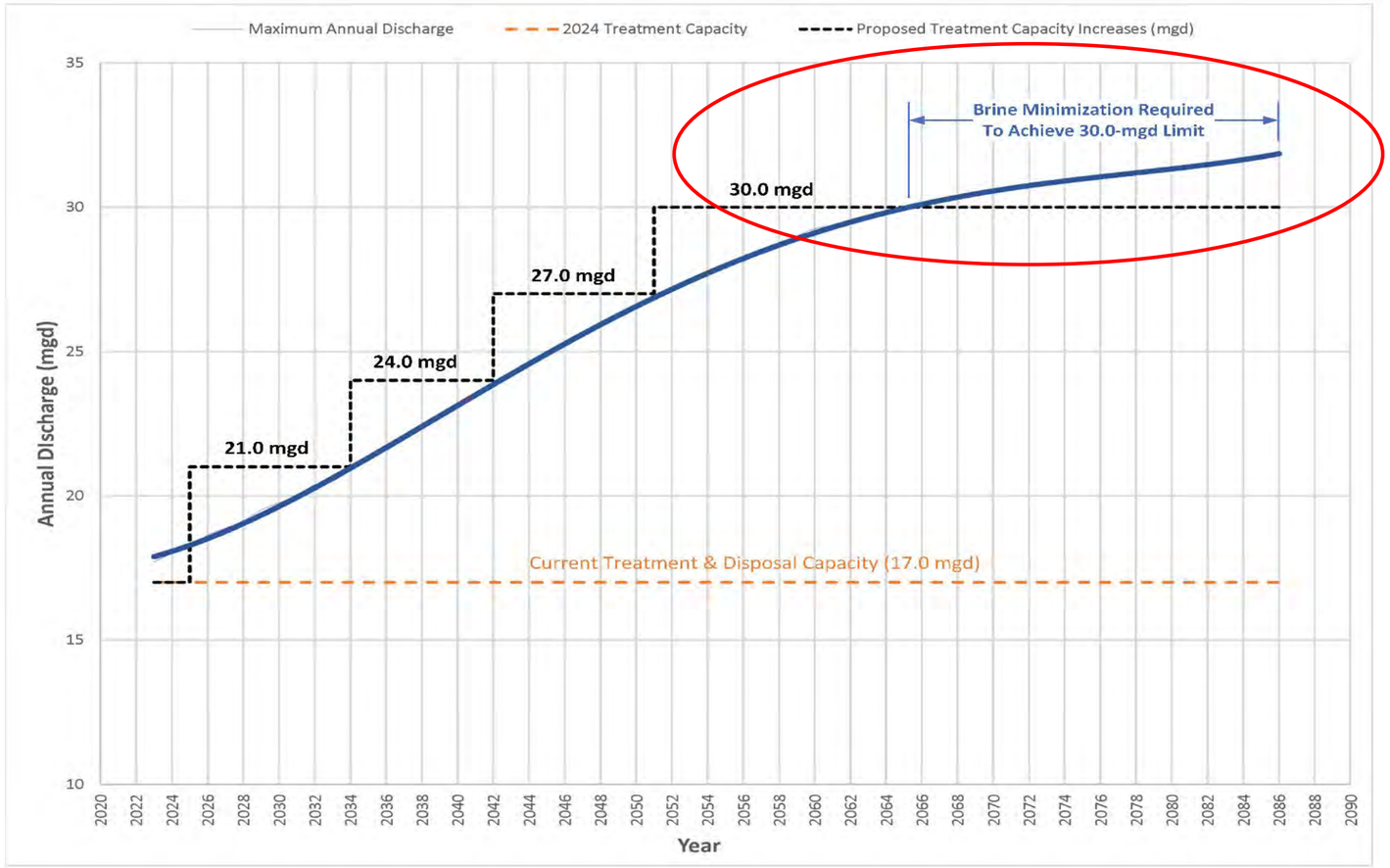
ID	Project	Planning Scenario	Cost Estimate	Benefits			Funding		
				Capacity	O&M	Regulatory	Rates	Reserves	Loan/Grant
FM-6	SCADA System Work Plan (Real-time flow and quality data collection).	Near-Term (FY 26 & FY 27)	$130,000	x	x	x	x		
CAP-4	SCADA System. Install SCADA system in 3 – 5 phases (master station, in-line monitoring, existing discharger sites)	Near-Term* (2025-2034)	$1,820,000	x	x	x		x	

Initial phases may be completed in FY 2026-2027 determination pending completion of Work Plan.

Capacity Management and Long-Term Planning Efforts
Brine Minimization (1 of 2)

Project description

- Brine minimization facilities to assure discharges to OC San remain below the 30 mgd capacity right
- Pursue implementation of a secondary brine concentration processes at desalination facilities
- In-line downstream centralized brine concentration approach was not considered to be feasible
    - Advancements in treatment technologies and treatment requirements for emerging constituents of concern could change this conclusion



Capacity Management and Long-Term Planning Efforts
Brine Minimization (2 of 2)

Benefits

- Manage maximum flows and oversold capacity
  - Brine Line projected total flow will exceed the 30 MGD Brine Line discharge limitation to OC San
  - SAWPA Member Agencies own 32.5 MGD of pipeline capacity
- Potential to treat for emerging constituent of concern

Implementation

- Future studies and pilot projects to evaluate brine management technologies

ID	Project	Planning Scenario	Cost Estimate	Benefits			Funding		
				Capacity	O&M	Regulatory	Rates	Reserves	Loan/Grant
FM-4A	Evaluate brine management technologies	Near-Term (FY 26 & FY 27)	$80,000	x		x	x		
FM-4B	Brine Minimization Study. Evaluate brine management technologies.	Near-Term (2025-2034)	$190,000	x		x	x		
CAP-18	Capacity Management Facility (Brine Minimization)	Build-out (Beyond 2048)	$ 35,000,000	x		x		x	x

Capacity Management and Long-Term Planning Efforts
Address increasing regulatory requirements – PFAS (1 of 2)

- PFAS present in Brine Line

Parameter	Result	Ave	Units
Perfluorooctanoic Acid (PFOA)	89 – 130	106	ng/L
Perfluorooctanesulfonic Acid (PFOS)	97 – 170	136	ng/L

- Future regulation of OC San's biosolids and ocean discharge?
- OC San has provided advanced notice of possible PFAS limits
- Investigate PFAS treatment options for brine flows
  - No specific regulations for PFAS in wastewater currently
  - Two scenarios for PFAS effluent limits (5x PFAS MCL and 10x PFAS MCL)
  - 15 MGD capacity

Item	Alternative 1: Novel Adsorbent Media	Alternative 2: EOX Systems	Alternative 3: Granular Activated Carbon
10 Year Capital Net Present Worth	$70 – $83 million	$109 – $129 million	$39 – $46 million
10 Year O&M Net Present Worth	$674 – $796 million	$3.3 – $3.9 billion	$62 – $73 million
Total 10 Year Net Present Worth	$744 – $879 million	$3.4 – $4 billion	$100 – $118 million

Capacity Management and Long-Term Planning Efforts
Address increasing regulatory requirements – PFAS (2 of 2)

Key findings and recommendations

- It may be more economical to remove PFAS from a few select dischargers rather than treating the entire Brine Line flow at a centralized treatment facility.
  - Assess dischargers that would be expected to have higher PFAS concentrations
- Continue to monitor PFAS regulations as they pertain to wastewater disposal and operations at OC San

Future studies

- Perform additional PFAS sampling
- Evaluate the viability of point source PFAS treatment using a smaller scalable system
- Conduct a pilot study to better inform estimates of PFAS treatment requirements and costs

ID	Project	Planning Scenario	Cost Estimate	Benefits			Funding		
				Capacity	O&M	Regulatory	Rates	Reserves	Loan/Grant
FM-5	PFAS Study. PFAS monitoring and treatment of PFAS in brine.	Near-Term (FY 26 & FY 27)	$200,000			x	x		

SANTA ANA WATERSHED PROJECT AUTHORITY

Multi-Use Benefits for the Future

Multi-Use Benefits for the Future

- Brine Line is a multi-use benefit system
  - Supports a variety of water recycling and desalination activities
- Improve system reliability and reduce impacts on dischargers during outages
- Integrating renewable energy technologies within the Brine Line system
  - In-pipe hydroelectric facilities (project not economically viable)
  - Green hydrogen production from brine flows
    - Future study to determine if producing green hydrogen from brine is viable
- Capture of dry weather runoff

Multi-Use Benefits for the Future

Project description

- Green hydrogen production from brine flows

Benefits

- Revenues from selling brine reduce Brine Line rates
- Reduce costs from OC San to treat and dispose of Brine
- Manage capacity by reducing discharges to OC San and remain below the 30 mgd capacity right
- Brine minimization facilities unnecessary eliminating future capital cost

Implementation

- Future study to determine if producing green hydrogen from brine is viable

ID	Project	Planning Scenario	Cost Estimate	Benefits			Funding		
				Capacity	O&M	Regulatory	Rates	Reserves	Loan/Grant
FM-3	Green Hydrogen Feasibility Study. Evaluate the feasibility of Brine for Green Hydrogen.	Near-Term (FY 26 & FY 27)	$200,000	x			x		

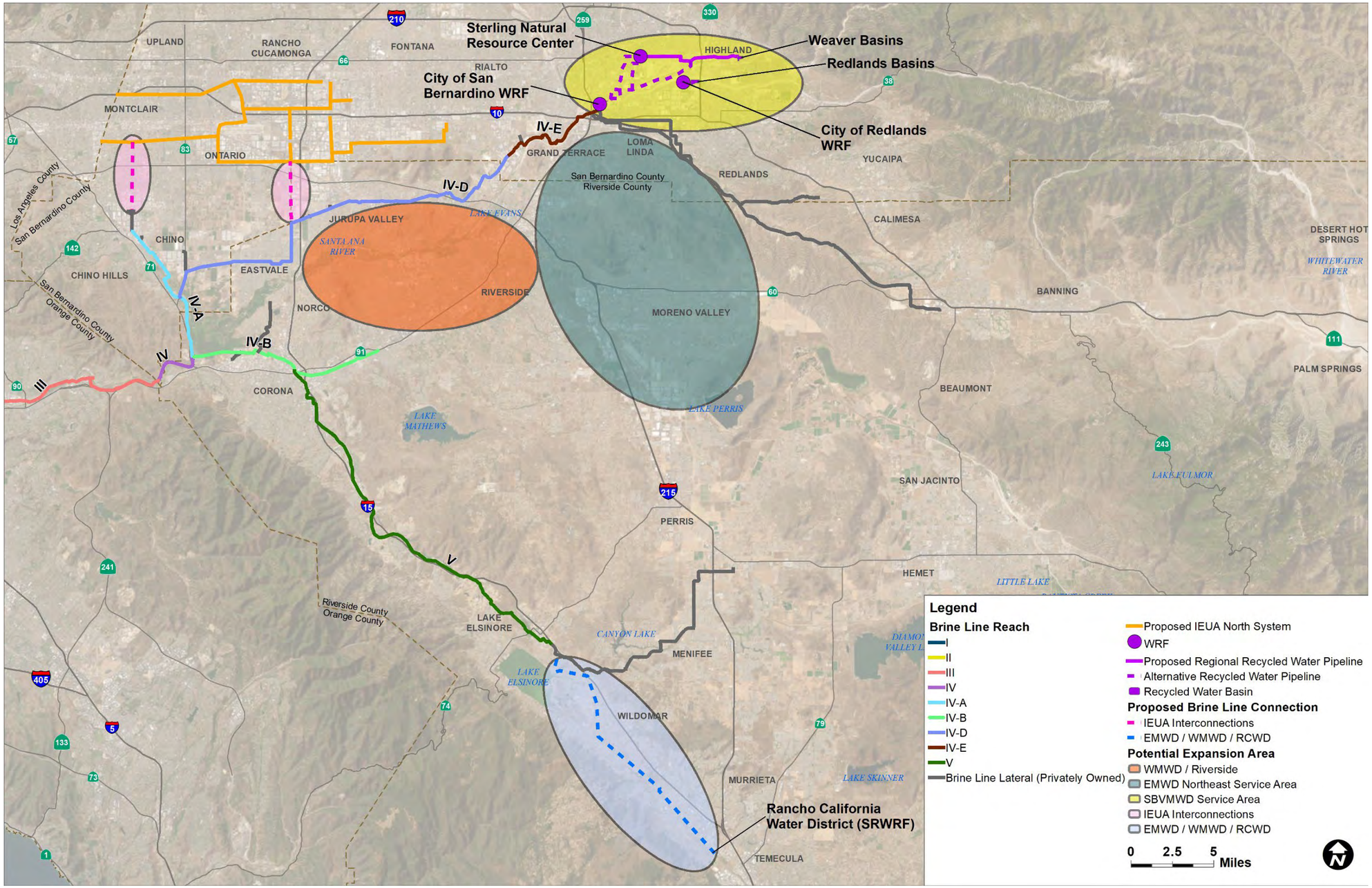
SANTA ANA WATERSHED PROJECT AUTHORITY

Future Facilities, Improvements and Expansion

Future Facilities, Improvements and Expansion

- Pipeline Capacity Improvement Projects (system capacity analysis)
- Operation and Maintenance Projects (capacity management)
- System Monitoring Projects (capacity management)
- Expansion Areas
  - EMWD / WMWD Service Area: Southern Riverside County Regional Brine Line
  - IEUA Service Area: Intertie with North System and Chino Basin Program
  - SBVMWD Service Area: Regional Recycled Water Facilities Project
  - WMWD Service Area: City of Riverside Recycled Water Desalination Plant

Future Facilities, Improvements and Expansion



SANTA ANA WATERSHED PROJECT AUTHORITY

Policy Considerations

Policy Considerations

- **Environmental and Regulatory Policies**
  - With increasing regulatory requirements and the potential for emerging constituents of concern, SAWPA may be faced with the need to establish stricter limits on concentration and/or constituents in brine discharges
  - Enhancing interagency collaboration and establishing a regional work group to coordinate efforts and share best practices can improve compliance and enforcement.

- **Economic Policies**
  - Many agencies and industries have expressed concerns that the construction of brine conveyance facilities can be cost prohibitive.
  - SAWPA and its Member Agencies may consider future mechanisms for cost-sharing and or funding facilities that provide a regional benefit to the watershed

SANTA ANA WATERSHED PROJECT AUTHORITY

Summary of Projects and Studies

ID	Project	Planning Scenario	Cost Estimate	Benefits			Funding		
				Capacity	O&M	Regulatory	Rates	Reserves	Loan/Grant
CAP-1	Reach IV Parallel Pipeline (Below Prado). Construct a 10,200 LF, 30-inch parallel line.	Build-out (Beyond 2048)	$19,520,000	x		X		x	x
CAP-2	Reach IV-A Pipeline Relocation (Prado). Replace 18,000 LF of existing 36-inch pipe with 48-inch pipe.	Build-out (Beyond 2048)	$55,114,000	x		x		x	x
CAP-3	Reach IV-D Parallel Pipeline (City of Chino). Construct a 5,9000 LF, 36-inch parallel line.	Build-out (Beyond 2048)	$13,526,500	X		x		x	x
FM-1	Off-line Storage Feasibility Study	Near-Term (FY 26 & FY 27)	$190,000	x	x	x	x		
CAP-4	Off-line Storage. Construct six 2 MG and one 0.5 MG off-line storage reservoirs	Near/Long Term (2032-2048)	$109,278,000	x	x	x		x	x
FM-2	Smart MAS Covers. Install smart covers at 6 locations.	Near-Term (2025-2034)	$175,000	X	x	x		x	
FM-3	Green Hydrogen Feasibility Study. Evaluate the feasibility of Brine for Green Hydrogen.	Near-Term (FY 26 & FY 27)	$200,000	x			x		
FM-4a	Evaluate brine management technologies	Near-Term (FY 26 & FY 27)	$80,000	x		x	x		
FM-4b	Brine Minimization Study. Evaluate brine management technologies	Near-Term (2025-2034)	$190,000	x		x	x		
CAP-18	Brine Minimization Study. Evaluate brine management technologies	Build-out (Beyond 2048)	$35,000,000	x		x		x	x
FM-5	PFAS Study. PFAS monitoring and treatment of PFAS in brine.	Near-Term (FY 26 & FY 27)	$200,000			x	x		
FM-6	SCADA System Work Plan (Real-time flow and quality data collection).	Near-Term (FY 26 & FY 27)	$130,000	x	x	x	x		
CAP-5	SCADA System. Install SCADA system in 3 – 5 phases (master station, in-line monitoring, existing discharger sites).	Near-Term (FY 26 & FY 27)	$1,820,000	x	x	x		x	
FM-7	Master Plan Market and Capacity Analysis Update	Near-Term (2025-2034)	$150,000	x	x	x	x		

Master Plan Implementation Next Steps and Schedule

• Receive Final Master Plan	Feb 2025
• Incorporate identified projects in next 2-year Budget	Jan – June 2025
• Issue RFP for SCADA Work Plan	Mar – Apr 2025
• Incorporate long-term Projects into CIP	Complete

Questions?

City of Chino Euclid Bridge Project
Brine Line Reach IV-A and IV- D

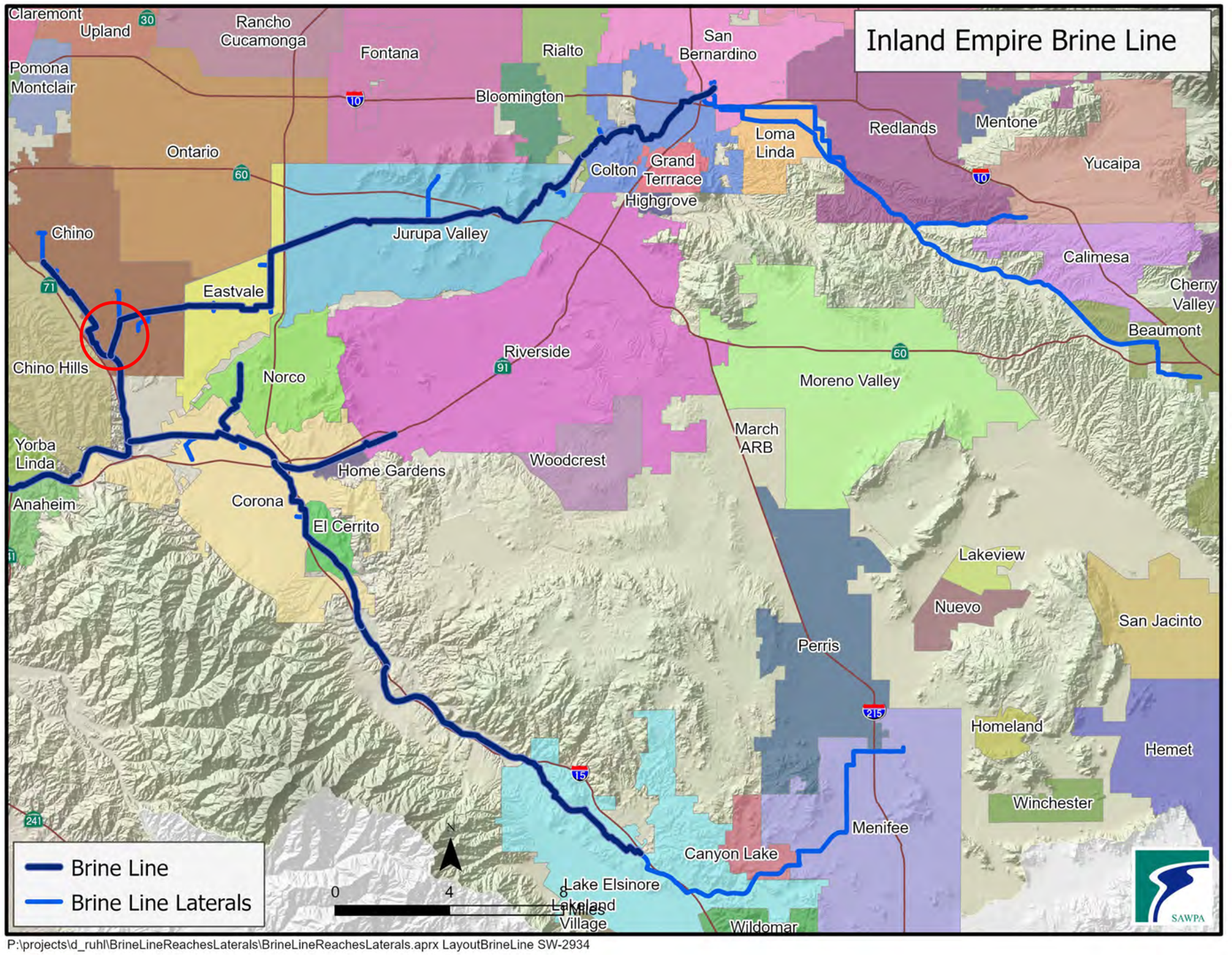
David Ruhl, Executive Manager of Engineering and Operations

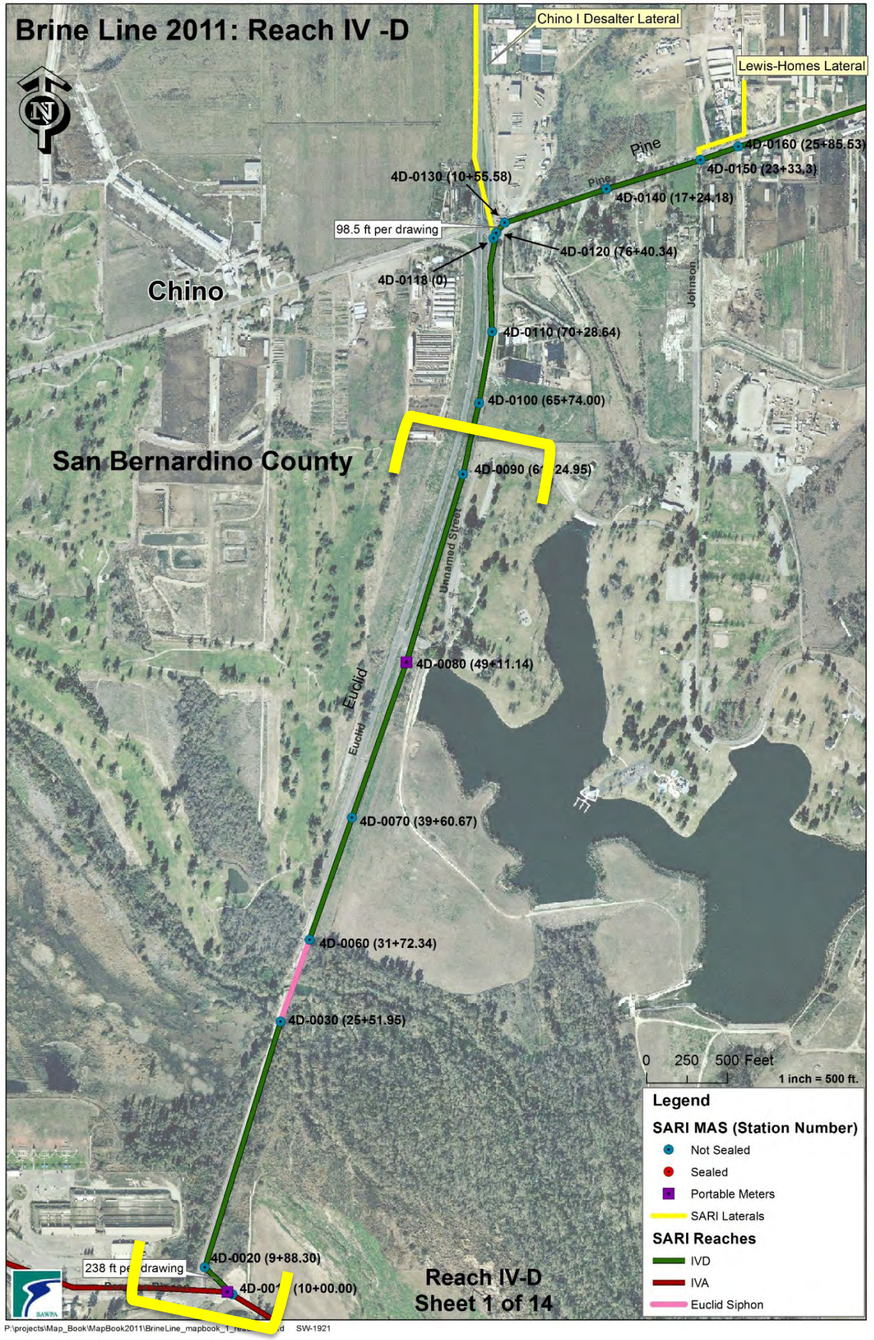
PA 24 Committee Meeting

February 4, 2025

Euclid Bridge Project - Location

- City of Chino is proposing to construct an elevated roadway along Euclid Avenue (State Hwy 83)
- Maintain access during flood events
- Potential impact to Reach IV-A and IV-D




Brine Line 2011: Reach IV -D
Chino I Desalter Lateral
Lewis-Homes Lateral
4D-0160 (25+85.53)
4D-0150 (23+33.3)
4D-0140 (17+24.18)
4D-0130 (10+55.58)
98.5 ft per drawing
4D-0120 (76+40.34)
4D-0118 (0)
Chino
4D-0110 (70+28.64)
4D-0100 (65+74.00)
San Bernardino County
4D-0090 (6 24.95)
4D-0080 (49+11.14)
4D-0070 (39+60.67)
4D-0060 (31+72.34)
4D-0030 (25+51.95)
4D-0020 (9+88.30)
4D-001 (10+00.00)
238 ft per drawing
Pine
Johnson
Unnamed Street
Euclid
0 250 500 Feet
1 inch = 500 ft.
Legend
SARI MAS (Station Number)
Not Sealed
Sealed
Portable Meters
SARI Laterals
SARI Reaches
IVD
IVA
Euclid Siphon
Reach IV-D
Sheet 1 of 14
P:\projects\Map_Book\MapBook2011\BrineLine_mapbook_1
SW-1921


Reach IV-D
Reach IV-A
Prado Olympic Shooting Park
Chino Creek
Euclid Ave (State Hwy 83)
Reach IV-A
Prado inundation area


Reach IV-D

Questions?