



SAWPA

SANTA ANA WATERSHED PROJECT AUTHORITY
11615 Sterling Avenue, Riverside, California 92503 • (951) 354-4220

This meeting will be conducted in person at the address listed above. As a convenience to the public, members of the public may also participate virtually using the zoom link provided below. The zoom link is for viewing purposes only; members of the public will not have speaking privileges virtually. Public Comments may be provided in person or submitted in advance to publiccomment@sawpa.gov. Speaking privileges through zoom are limited to approved entities and pre-vetted participants who must request authorization. However, in the event there is a disruption of service which prevents the Authority from broadcasting the meeting to members of the public, the meeting will not be postponed or rescheduled but will continue without remote participation. The remote participation option is provided as a convenience to the public and is not required. Members of the public are welcome to attend the meeting in-person.

ZOOM LINK FOR VIEWING ONLY

<https://sawpa.zoom.us/j/89021830244>

REGULAR MEETING OF THE PROJECT AGREEMENT 24 COMMITTEE TUESDAY, DECEMBER 2, 2025 – 10:00 A.M. (or immediately following the 9:30 a.m. SAWPA Commission meeting)

AGENDA

1. CALL TO ORDER | PLEDGE OF ALLEGIANCE

2. ROLL CALL

3. PUBLIC COMMENTS

Members of the public may address the Committee on items within the jurisdiction of the Committee; however, no action may be taken on an item not appearing on the agenda unless the action is otherwise authorized by Government Code §54954.2(b).

Members of the public may make comments in-person or electronically for the Committee's consideration by sending them to publiccomment@sawpa.gov with the subject line "Public Comment". Submit your electronic comments by 5:00 p.m. on Monday, December 1, 2025. All public comments will be provided to the Chair and may be read into the record or compiled as part of the record. Individuals have a limit of three (3) minutes to make comments and will have the opportunity when called upon by the Committee.

4. ITEMS TO BE ADDED OR DELETED

Pursuant to Government Code §54954.2(b), items may be added on which there is a need to take immediate action and the need for action came to the attention of the Santa Ana Watershed Project Authority subsequent to the posting of the agenda.

5. CONSENT CALENDAR

All matters listed on the Consent Calendar are considered routine and non-controversial and will be acted upon by the Committee by one motion as listed below.

- A. APPROVAL OF MEETING MINUTES: NOVEMBER 4, 20255
Recommendation: Approve as posted.

6. COMMITTEE DISCUSSION/ACTION ITEMS

- A. **INLAND EMPIRE BRINE LINE REACH IV-B LOWER MAINTENANCE ACCESS STRUCTURE PROJECT (PA24#2025.23)**9
Presenter: David Ruhl
Recommendation: That the Project Agreement 24 Committee authorize the General Manager to execute the General Services Agreement and Task Order No. AAWA320-03-01 with Albert A. Webb Associates in an amount not-to-exceed \$127,294 for engineering services for the Inland Empire Brine Line Reach IV-B Lower Maintenance Access Structure Project.
- B. **BRINE LINE SOLIDS IMBALANCE AND BILLING FORMULA UPDATE (PA24#2025.24)**.39
Presenter: Lucas Gilbert
Recommendation: Receive and file.

7. INFORMATIONAL REPORTS

Recommendation: Receive for information.

- A. **BRINE LINE FINANCIAL REPORT – SEPTEMBER 2025**159
Presenter: Karen Williams
- B. **FINANCIAL REPORT FOR THE INLAND EMPIRE BRINE LINE ENTERPRISE/CIP FOR THE FIRST QUARTER ENDING SEPTEMBER 30, 2025**165
Presenter: Karen Williams
- C. **GENERAL MANAGER REPORT**
Presenter: Karen Williams
- D. **COMMITTEE MEMBERS COMMENTS**
- E. **CHAIR’S COMMENTS/REPORT**

8. COMMITTEE MEMBER REQUESTS FOR FUTURE AGENDA ITEMS

9. CLOSED SESSION

There were no Closed Session items anticipated at the time of the posting of this agenda.

10. ADJOURNMENT

PLEASE NOTE:

In compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, please contact the Clerk of the Board at (951) 354-4220. Notification at least 48 hours prior to the meeting will enable staff to make reasonable arrangements to ensure accessibility to this meeting.

Materials related to an item on this agenda submitted to the Committee after distribution of the agenda packet are available for public inspection during normal business hours at the SAWPA office, 11615 Sterling Avenue, Riverside, and available at www.sawpa.org, subject to staff's ability to post documents prior to the meeting.

Declaration of Posting

I, Sara Villa, Clerk of the Board of the Santa Ana Watershed Project Authority declare that on November 24, 2025, a copy of this agenda has been uploaded to the SAWPA website at www.sawpa.gov and posted at the SAWPA's office, 11615 Sterling Avenue, Riverside, CA 92503.

2025 Project Agreement 24 Committee Regular Meetings

Inland Empire Brine Line

First Tuesday of Every Month

(Note: All meetings begin at 10:00 a.m., or immediately following the 9:30 a.m. SAWPA Commission meeting, whichever is earlier, unless otherwise noticed, and are held at SAWPA.)

January		February	
1/7/25	Regular Committee Meeting [cancelled]	2/4/25	Regular Committee Meeting
March		April	
3/4/25	Regular Committee Meeting	4/1/25	Regular Committee Meeting
May		June	
5/6/25	Regular Committee Meeting	6/3/25	Regular Committee Meeting, EMWD
July		August	
7/1/25	Regular Committee Meeting, WMWD	8/5/25	Regular Committee Meeting, SBVMWD
September		October	
9/2/25	Regular Committee Meeting, SBVMWD	10/7/25	Regular Committee Meeting
November		December	
11/4/25	Regular Committee Meeting	12/2/25	Regular Committee Meeting

2026 Project Agreement 24 Committee Regular Meetings

Inland Empire Brine Line

First Tuesday of Every Month

(Note: All meetings begin at 10:00 a.m., or immediately following the 9:30 a.m. SAWPA Commission meeting, whichever is earlier, unless otherwise noticed, and are held at SAWPA.)

January		February	
1/6/26	Regular Committee Meeting [cancelled]	2/3/26	Regular Committee Meeting
March		April	
3/3/26	Regular Committee Meeting	4/7/26	Regular Committee Meeting
May		June	
5/5/26	Regular Committee Meeting	6/2/26	Regular Committee Meeting
July		August	
7/7/26	Regular Committee Meeting	8/4/26	Regular Committee Meeting
September		October	
9/1/26	Regular Committee Meeting	10/6/26	Regular Committee Meeting
November		December	
11/3/26	Regular Committee Meeting	12/1/26	Regular Committee Meeting

Page Intentionally Blank



PROJECT AGREEMENT 24 COMMITTEE
Inland Empire Brine Line
REGULAR MEETING MINUTES
November 4, 2025

COMMITTEE MEMBERS PRESENT

T. Milford Harrison, Chair, San Bernardino Valley Municipal Water District Governing Board
Mike Gardner, Vice Chair, Western Municipal Water District Governing Board
Philip Paule, Eastern Municipal Water District Governing Board
Jasmin A. Hall, Inland Empire Utilities Agency Governing Board

COMMITTEE MEMBERS ABSENT

None.

ALTERNATE COMMITTEE MEMBERS PRESENT [Non-Voting]

Gil Botello, San Bernardino Valley Municipal Water District
Derek Kawaii, Western Municipal Water District [via – zoom]

STAFF PRESENT

Karen Williams, David Ruhl, Dean Unger, John Leete, Sara Villa, Daniel Vasquez, Haley Gohari, Marie Jauregui

OTHERS PRESENT

Thomas S. Bunn, Lagerlof, LLP; Fred Jung, Orange County Water District; Jennifer Ares, Yucaipa Valley Water District

1. CALL TO ORDER | PLEDGE OF ALLEGIANCE

The Regular Meeting of the PA 24 Committee was called to order at 10:01 a.m. by Chair T. Milford Harrison on behalf of the Santa Ana Watershed Project Authority, 11615 Sterling Avenue, Riverside, CA 92503.

2. ROLL CALL

3. PUBLIC COMMENTS

There were no public comments; there were no public comments received via email.

4. ITEMS TO BE ADDED OR DELETED

There were no items to be added or deleted.

5. CONSENT CALENDAR

A. APPROVAL OF MEETING MINUTES: OCTOBER 7, 2025

Recommendation: Approve as posted.

MOVED, to approve the Consent Calendar as posted.

Result:	Adopted by Roll Call Vote
Motion/Second:	Hal/Gardner
Ayes:	Gardner, Hall, Harrison, Paule
Nays:	None
Abstentions:	None
Absent:	None

6. COMMITTEE DISCUSSION/ACTION ITEMS

A. BRINE LINE SCADA DESIGN PROJECT STATUS UPDATE (PA24#2025.21)

Daniel Vasquez provided a presentation on the Brine Line SCADA Design Project Update, contained in the agenda packet on pages 11-21.

The development of a SCADA system for the Brine Line was outlined in the Brine Line Master Plan as part of future Capital Improvement Plan (CIP) projects. This system will significantly enhance SAWPA's ability to monitor and manage the Brine Line by providing real-time flow and water quality data. The project includes designing a comprehensive SCADA system, which will feature five in-line flow monitoring stations and remote data collection devices for each direct Brine Line discharger.

Mr. Vasquez noted that in May 2025, the Design Specification and Work Plan was awarded to Dudek. A kickoff meeting in June sets the project scope, schedule, and strategies for data collection and assessment. Starting in August, SAWPA staff and Dudek began coordinating with member agencies' industrial dischargers to schedule site visits. During these visits, the teams collect data on existing meters, power sources, cellular signal strength, water quality monitoring, and infrastructure placement while ensuring security measures are in place. To date, 16 out of 39 site visits have been completed.

Following the Data Review and assessment stage, Dudek will prepare the preliminary Design and Work Plan, detailing the SCADA system's architecture, network, sensor locations, and screen mockups. SAWPA will review and provide feedback before presenting the preliminary design to the PA 24 Committee. This will be followed by 60%, 90%, and 100% design phases, with opportunities for member agency staff to provide feedback. There was no discussion.

This item is to receive and file; no action was taken on agenda item no. 6.A.

B. SANTA ANA RIVER TRAIL PROJECT COORDINATION STATUS UPDATE (PA24#2025.22)

Daniel Vasquez provided a presentation on the Santa Ana River Trail Project Coordination Status Update, contained in the agenda packet on pages 25-37.

Senate Bill 1390, passed in 2014, established the Santa Ana River Conservancy (SARCON) and tasked it with developing the Santa Ana River Trail (SART) implementation plan and creating the SART Advisory Group. PA 24 Committee Chair, T. Milford Harrison currently represents SAWPA on this Advisory Group.

In 2014, SAWPA also signed a 25-year operations and maintenance agreement with Riverside County Regional Park and Open-Space District (RivCo Parks) for a segment of the SART below Prado Dam, along Reach IV of the Brine Line. SAWPA owns both real property and easements along this proposed trail segment. SAWPA has been involved in planning for Phase 6 of the SART, providing input on maintaining access for Brine Line repairs, reviewing the proposed elevated bridge over the BNSF railroad crossing, and addressing utility relocations on SAWPA property. Phase 6 is expected to begin construction in 2026, and SAWPA staff has reviewed and provided final comments on the 100% design plans to the Riverside County Transportation Commission (RCTC).

Mr. Vasquez noted that in November 2024, the PA 24 Committee approved a License Agreement with AT&T to relocate telecommunications facilities on SAWPA property, and the relocation is now complete. A similar License Agreement with Southern California Edison (SCE) for utility relocation is under review by SCE staff. RivCo Parks is also reviewing the License Agreement for constructing the SART over SAWPA property. These agreements include provisions to protect SAWPA's property rights, ensure the safety of the Brine Line, and maintain access for Brine Line maintenance.

SAWPA staff has reviewed the design plans for Phase 2A, this phase involves removing existing concrete pads, raising concrete shafts, re-coating internal MAS, and establishing a higher grade for manholes. Future PA 24 Committee items will include approval of the SCE and RivCo Parks License Agreements, which are expected to be presented for approval in early 2026.

This item is to receive and file; no action was taken on agenda item no. 6.B.

7. INFORMATIONAL REPORTS

Recommendation: Receive and file the following oral/written reports/updates.

A. BRINE LINE FINANCIAL REPORT – AUGUST 2025

B. GENERAL MANAGER REPORT

Karen Williams reported that the investment firm, Chandler, has now fully invested all of SAWPA's reserve funds. That process is complete, and we should start seeing returns soon. It is anticipated that Chandler will give a presentation on progress in December.

C. COMMITTEE MEMBERS COMMENTS

There were no comments/reports from the Committee.

D. CHAIR'S COMMENTS/REPORT

Chair T. Milford Harrison expressed his excitement about receiving more updates and seeing progress on the Santa Ana River Trail, with the goal of eventually riding his bike from his garage all the way to the ocean.

8. COMMITTEE MEMBER REQUESTS FOR FUTURE AGENDA ITEMS

There were no requests for future Agenda items.

9. CLOSED SESSION

There was no Closed Session.

10. ADJOURNMENT

There being no further business for review, Committee Chair T. Milford Harrison adjourned the Regular meeting at 10:21 a.m.

Approved at a Regular Meeting of the Project Agreement 24 Committee on December 2, 2025.

T. Milford Harrison, Chair

Attest:

Sara Villa, Clerk of the Board

Page Intentionally Blank

PA 24 COMMITTEE MEMORANDUM NO. 2025.23

DATE: December 2, 2025

TO: Project Agreement 24 Committee
(Inland Empire Brine Line)

SUBJECT: Inland Empire Brine Line Reach IV-B Lower Maintenance Access
Structure Project

PREPARED BY: David Ruhl, Executive Manager of Engineering and Operations

RECOMMENDATION

That the Project Agreement 24 Committee authorize the General Manager to execute the General Services Agreement and Task Order No. AAWA320-03-01 with Albert A. Webb Associates in an amount not-to-exceed \$127,294 for engineering services for the Inland Empire Brine Line Reach IV-B Lower Maintenance Access Structure Project.

DISCUSSION

In October 2025, staff issued a Request for Proposals (RFP) for engineering services for the Inland Empire Brine Line Reach IV-B Lower Maintenance Access Structure (MAS) Project. Two (2) proposals were received on November 18, 2025, from the following firms:

- Albert A. Webb Associates
- Dudek

SAWPA staff reviewed the proposals and interviewed the two (2) proposing firms on November 21st. The firms were scored on criteria outlined in the RFP (project understanding, technical approach, relevant qualifications, experience, level of effort and references).

The cost proposals submitted were reviewed and scored. The cost proposal score was added to the interview score for a total interview score. Based on the RFP criteria, Albert A. Webb Associates received the highest total score and was deemed the most qualified firm to perform the work. Albert A. Webb Associates received favorable responses from their references. The fee proposal and score are as follows:

<u>Firm</u>	<u>Fee Proposal</u>	<u>Score</u>
Albert A. Webb Associates	\$127,294	92.3
Dudek	\$159,582	90.8

A copy of the Task Order, Scope of Work and Fee Estimate is attached for your information.

Reach IV-B Lower Pipeline Background

The Brine Line Reach IV-B was constructed in the mid 1990's and runs from Prado Dam approximately 5.5 miles east, to the intersection with Reach IV-B Upper and Reach V in the City of Corona. The pipeline size ranges from 30 to 36 - inches in diameter. There are 47 maintenance access structures (MAS) on Reach IV-B Lower with an average distance between MAS of about 650 feet. The Reach IV-B daily flow is approximately 5 – 7 million gallons per day (MGD) and has a maximum capacity of 13.0 MGD.

Pipeline Condition Assessment

In 2023, the Project Agreement 24 Committee authorized Woodard & Curran to prepare a pipeline condition assessment on a portion of Reach IV-B Lower. This portion of the Brine Line was identified with a high criticality as described in the 2021 Brine Line Criticality Assessment due to the age of the pipeline, location and the ductile iron pipe material. A condition assessment of the Reach IV-B pipeline was conducted through visual assessment (manned entry and CCTV inspection) in May 2023. Staff presented the Final Report to the PA 24 Committee in September 2024.

One segment of the pipeline has a distance between MAS of 2,096 feet. For access and inspection purposes a distance of 1,000 feet or less is desirable for the Brine Line. Due to the distance between MAS's, access for cleaning and CCTV was limited. As a result, only about 50% of the pipe segment was cleaned and inspected. Due to the limited access to Reach IV-B Lower, the consultant recommended adding up to two MAS to Reach IV-B to allow better access for cleaning, CCTV and future repairs.

The professional services of an engineering firm are necessary to design the new MAS as recommended in the Reach IV-B Condition Assessment.

RESOURCE IMPACTS

Sufficient funds for engineering services and to cover the field investigation work are included in the Fiscal Year 2026 Budget Fund 240 (Brine Line Enterprise).

Attachments:

1. PowerPoint Presentation
2. General Services Agreement
3. Task Order No. AAWA320-03-01



Inland Empire Brine Line Reach IV-B Lower Maintenance Access Structure Project

David Ruhl, Executive Manager of
Engineering and Operations

December 2, 2025

Project Agreement 24 Committee

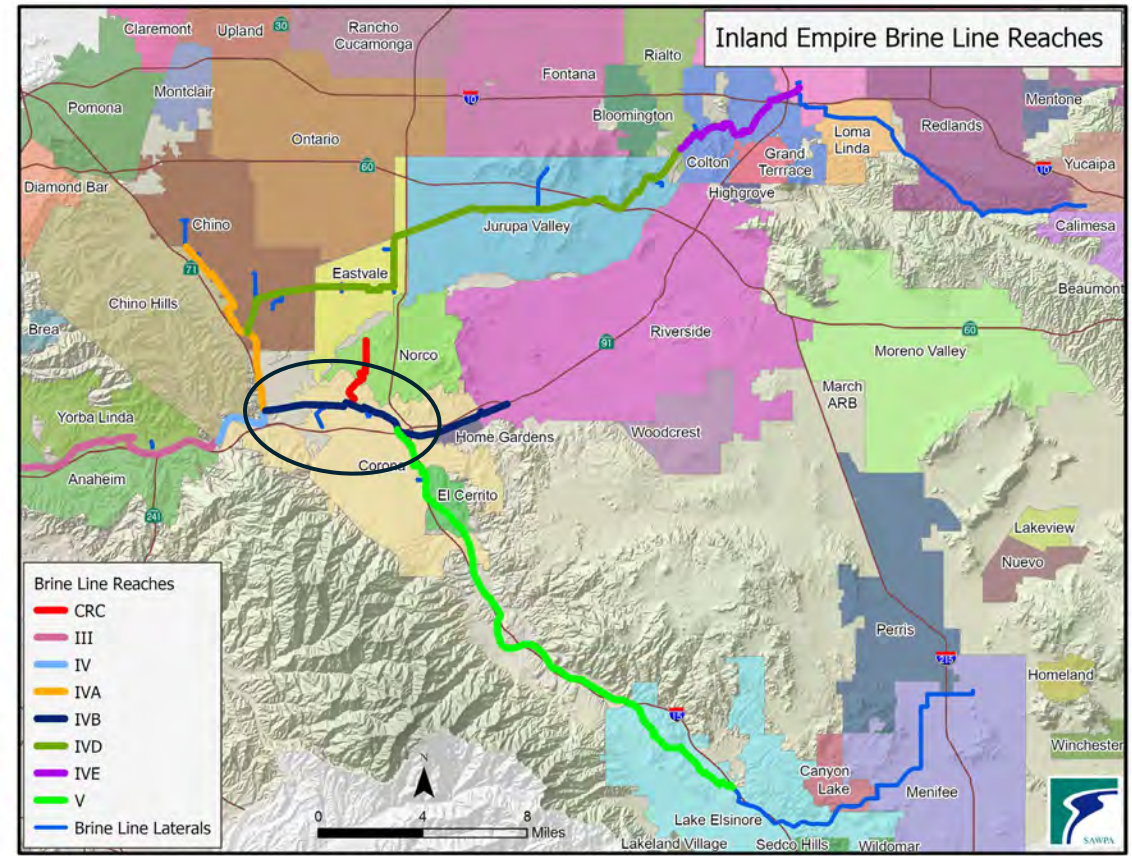
Recommendation

That the Project Agreement 24 Committee authorize the General Manager to execute the General Services Agreement and Task Order No. AAWA320-03-01 with Albert A. Webb Associates in an amount not-to-exceed \$127,294 for engineering services for the Inland Empire Brine Line Reach IV-B Lower Maintenance Access Structure Project.

Reach IV-B

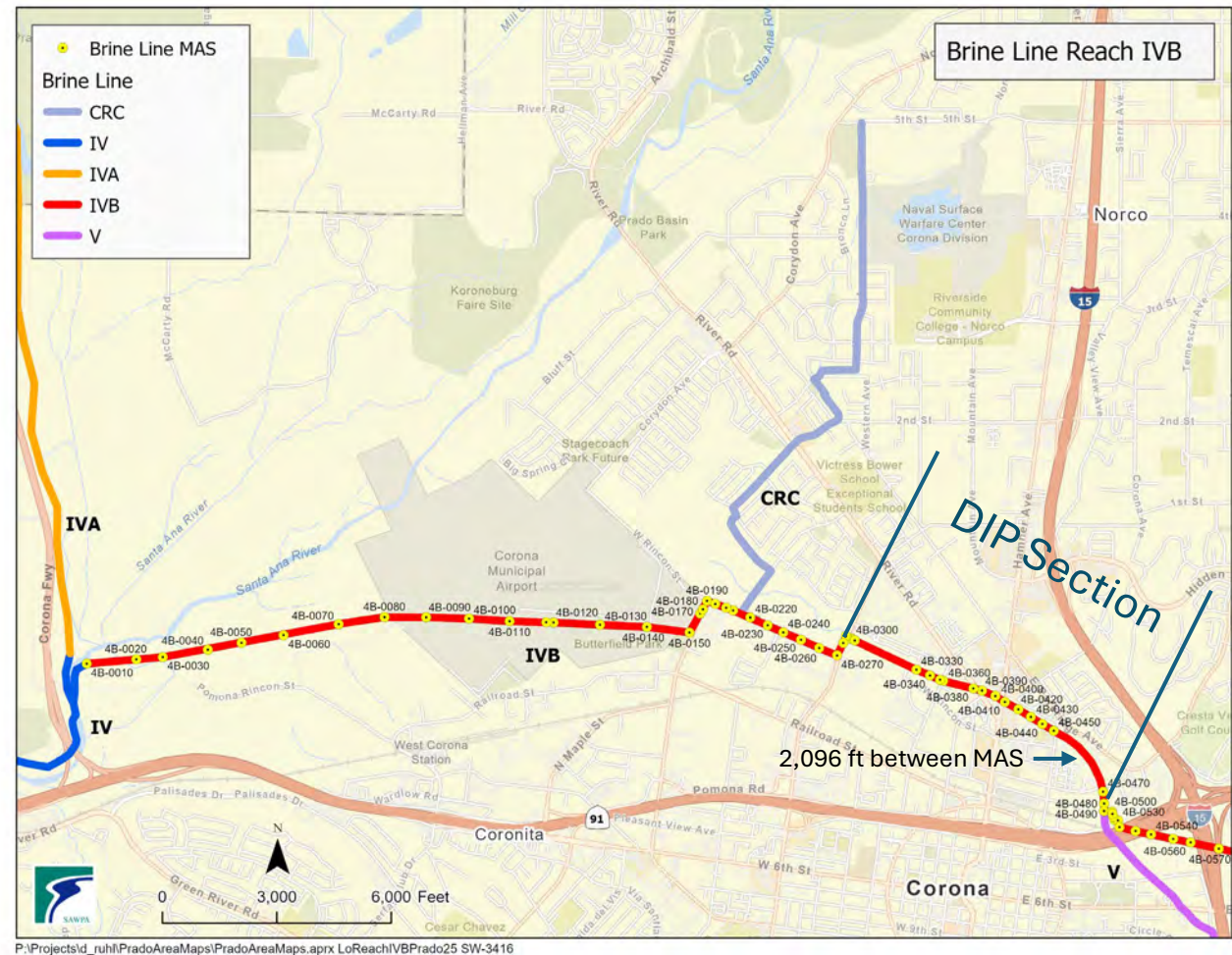
Reach IV-B Lower Background

- Constructed in mid 1990's
- Approximately 5.5 miles
- Pipeline size 30 – 36 inches in Diameter
- 47 Maintenance Access Structure
- Daily flow 5 – 7 MGD
- Maximum Capacity 13 MGD



Reach IV-B Condition Assessment

- Condition Assessment May 2023
- Final Report to PA 24 September 2024
- Near term recommendation to add additional MAS's
 - Access for cleaning, inspection and repairs limited due to distance between MAS
- Engineering services are necessary to prepare plans and specifications for the addition of two MASs.



Selection Process

- 2 Proposals received
 - Albert A. Webb Associates
 - Dudek
- Both firms selected for interview
- Selection based on scoring of the proposals, interviews, and fee proposal

Selection Process (cont.)

Firm	Fee Proposal	Score
Albert A. Webb	\$127,294	92.3
Dudek	\$159,582	90.8

- Albert A. Webb Associates selected as most qualified

Schedule and Budget



Schedule

- PA 24 Approve Contract Dec 2, 2025
- Design Jan – Aug 2026
- Bid Construction Late 2026

Budget

- Design and Related Field Work \$150,000
- Construction \$375,000

Estimate of construction costs will be refined during design.

Recommendation

That the Project Agreement 24 Committee authorize the General Manager to execute the General Services Agreement and Task Order No. AAWA320-03-01 with Albert A. Webb Associates in an amount not-to-exceed \$127,294 for engineering services for the Inland Empire Brine Line Reach IV-B Lower Maintenance Access Structure Project.

Contact Information

David Ruhl

*Executive Manager of Engineering and
Operations*

Druhl@sawpa.gov

Page Intentionally Blank



SANTA ANA WATERSHED PROJECT AUTHORITY
GENERAL SERVICES AGREEMENT FOR SERVICES BY INDEPENDENT CONSULTANT

This Agreement is made this **2nd day of December, 2025** by and between the Santa Ana Watershed Project Authority ("SAWPA") located at 11615 Sterling Avenue, Riverside, CA 92503 and Albert A. Webb Associates ("Consultant") whose address is 3788 McCray Street, Riverside, CA 92506.

RECITALS

This Agreement is entered into on the basis of the following facts, understandings, and intentions of the parties to this Agreement:

- SAWPA desires to engage the professional services of Consultant to perform such professional consulting services as may be assigned, from time to time, by SAWPA in writing;
- Consultant agrees to provide such services pursuant to, and in accordance with, the terms and conditions of this Agreement and has represented and warrants to SAWPA that Consultant possesses the necessary skills, qualifications, personnel, and equipment to provide such services; and
- The services to be performed by Consultant shall be specifically described in one or more written Task Orders issued by SAWPA to Consultant pursuant to this Agreement.

AGREEMENT

Now, therefore, in consideration of the foregoing Recitals and mutual covenants contained herein, SAWPA and Consultant agree to the following:

ARTICLE I

TERM OF AGREEMENT

1.01 This agreement shall become effective on the date first above written and shall continue until **December 31, 2028**, unless extended or sooner terminated as provided for herein.

ARTICLE II

SERVICES TO BE PERFORMED

2.01 Consultant agrees to provide such professional consulting services as may be assigned, from time to time, in writing by the Commission and the General Manager of SAWPA. Each assignment shall be made in the form of a written Task Order. Each such Task Order shall include, but shall not be limited to, a description of the nature and scope of the services to be performed by Consultant, the amount of compensation to be paid, and the expected time of completion.

2.02 Consultant may at Consultant's sole cost and expense, employ such competent and qualified independent professional associates, subcontractors, and consultants as Consultant deems necessary to perform each assignment; provided that Consultant shall not subcontract any work to be performed without the prior written consent of SAWPA.

ARTICLE III

COMPENSATION

3.01 In consideration for the services to be performed by Consultant, SAWPA agrees to pay Consultant as provided for in each Task Order.

3.02 Each Task Order shall specify a total not-to-exceed sum of money and shall be based upon the regular hourly rates customarily charged by Consultant to its clients.

3.03 Consultant shall not be compensated for any services rendered nor reimbursed for any expenses incurred in excess of those authorized in any Task Order unless approved in advance by the Commission and General Manager of SAWPA, in writing.

3.04 Unless otherwise provided for in any Task Order issued pursuant to this Agreement, payment of compensation earned shall be made in monthly installments after receipt from Consultant of a timely, detailed, corrected, written invoice by SAWPA's Project Manager, describing, without limitation, the services performed, when such services were performed, the time spent performing such services, the hourly rate charged therefore, and the identity of individuals performing such services for the benefit of SAWPA. Such invoices shall also include a detailed itemization of expenses incurred. Upon approval by an authorized SAWPA employee, SAWPA will pay within 30 days after receipt of a valid invoice from Consultant.

ARTICLE IV

CONSULTANT OBLIGATIONS

4.01 Consultant agrees to perform all assigned services in accordance with the terms and conditions of this Agreement including those specified in each Task Order. In performing the services required by this Agreement and any related Task Order Consultant shall comply with all local, state and federal laws, rules and regulations. Consultant shall also obtain and pay for any permits required for the services it performs under this Agreement and any related Task Order.

4.02 Except as otherwise provided for in each Task Order, Consultant will supply all personnel and equipment required to perform the assigned services.

4.03 Consultant shall be solely responsible for the health and safety of its employees, agents and subcontractors in performing the services assigned by SAWPA.

4.04 Insurance Coverage: Consultant shall procure and maintain for the duration of this Agreement insurance against claims for injuries or death to persons or damages to property which may arise from or in connection with the performance of the work hereunder and the results of that work by the Consultant, its agents, representatives, employees or sub-contractors.

4.04(a) Coverage - Coverage shall be at least as broad as the following:

- 1. Commercial General Liability (CGL)** - Insurance Services Office (ISO) Commercial General Liability Coverage (Occurrence Form CG 00 01) including products and completed operations, property damage, bodily injury, personal and advertising injury with limit of at least two million dollars (\$2,000,000) per occurrence or the full per occurrence limits of the policies available, whichever is greater. If a general aggregate limit applies, either the general aggregate limit shall apply separately to this project/location (coverage as broad as the ISO CG 25 03, or ISO CG 25 04 endorsement provided to SAWPA) or the general aggregate limit shall be twice the required occurrence limit.
- 2. Automobile Liability** – (if necessary) Insurance Services Office (ISO) Business Auto Coverage (Form CA 00 01), covering Symbol 1 (any auto) or if Consultant has no owned autos, Symbol 8 (hired) and 9 (non-owned) with limit of one million dollars (\$1,000,000) for bodily injury and property damage each accident.
- 3. Workers' Compensation Insurance** - as required by the State of California, with Statutory Limits, and Employer's Liability Insurance with limit of no less than \$1,000,000 per accident for bodily injury or disease.
- 4. Professional Liability** - (Also known as Errors & Omission) Insurance appropriate to the Consultant profession, with limits no less than \$1,000,000 per occurrence or claim, and \$2,000,000 policy aggregate.
- 5. Cyber Liability Insurance (Technology Professional Liability – Errors and Omissions)** – If Consultant will be providing technology services, limits not less than \$2,000,000 per occurrence or claim, and \$2,000,000 aggregate or the full per occurrence limits of the policies available, whichever is greater. Coverage shall be sufficiently broad to respond to the duties and obligations as is undertaken by Consultant in this Agreement and shall include, but not be limited to, claims involving infringement of intellectual property, including but not limited to infringement of copyright, trademark, trade dress,

invasion of privacy violations, information theft, damage to or destruction of electronic information, release of private information, alteration of electronic information, extortion and network security. The policy shall provide coverage for breach response costs as well as regulatory fines and penalties as well as credit monitoring expenses with limits sufficient to respond to these obligations.

If the Consultant maintains broader coverage and/or higher limits than the minimums shown above, SAWPA requires and shall be entitled to the broader coverage and/or higher limits maintained by the Consultant. Any available insurance proceeds in excess of the specified minimum limits of insurance and coverage shall be available to SAWPA.

4.04(b) If Claims Made Policies:

1. The Retroactive Date must be shown and must be before the date of the contract or the beginning of contract work.
2. Insurance must be maintained and evidence of insurance must be provided **for at least five (5) years after completion of the contract of work.**
3. If coverage is canceled or non-renewed, and not **replaced with another claims-made policy form with a Retroactive Date** prior to the contract effective date, the Consultant must purchase "extended reporting" coverage for a minimum of **five (5) years** after completion of contract work.

4.04(c) Waiver of Subrogation: The insurer(s) named above agree to waive all rights of subrogation against SAWPA, its elected or appointed officers, officials, agents, authorized volunteers and employees for losses paid under the terms of this policy which arise from work performed by the Named Insured for the Agency; but this provision applies regardless of whether or not SAWPA has received a waiver of subrogation from the insurer.

4.04(d) Other Required Provisions - The general liability policy must contain, or be endorsed to contain, the following provisions:

1. **Additional Insured Status:** SAWPA, its directors, officers, employees, and authorized volunteers are to be given insured status (at least as broad as ISO Form CG 20 10 10 01), with respect to liability arising out of work or operations performed by or on behalf of the Consultant including materials, parts, or equipment furnished in connection with such work or operations.
2. **Primary Coverage:** For any claims related to this project, the Consultant's insurance coverage shall be primary at least as broad as ISO CG 20 01 04 13 as respects to SAWPA, its directors, officers, employees and authorized volunteers. Any insurance or self-insurance maintained by the Member Water Agency its directors, officers, employees and authorized volunteers shall be excess of the Consultant's insurance and shall not contribute with it.

4.04(e) Notice of Cancellation: Each insurance policy required above shall provide that coverage shall not be canceled, except with notice to SAWPA.

4.04(f) Self-Insured Retentions - Self-insured retentions must be declared to and approved by SAWPA. SAWPA may require the Consultant to provide proof of ability to pay losses and related investigations, claim administration, and defense expenses within the retention. The policy language shall provide, or be endorsed to provide, that the self-insured retention may be satisfied by either the named insured or SAWPA.

4.04(g) Acceptability of Insurers - Insurance is to be placed with insurers having a current A.M. Best rating of no less than A: VII or as otherwise approved by SAWPA.

4.04(h) Verification of Coverage – Consultant shall furnish SAWPA with certificates and amendatory endorsements or copies of the applicable policy language effecting coverage required by this clause. All certificates and endorsements are to be received and approved by SAWPA before work commences. However, failure to obtain the required documents prior to the work beginning shall not waive the Consultant's obligation to provide them. SAWPA reserves the right to require complete, certified copies of all required insurance policies, including policy Declaration pages and Endorsement pages.

4.04(i) Subcontractors - Consultant shall require and verify that all subcontractors maintain insurance meeting all the requirements stated herein, and Consultant shall ensure that SAWPA, its directors, officers, employees and authorized volunteers are additional insureds on Commercial General Liability Coverage.

4.05 Consultant hereby covenants and agrees that SAWPA, its officers, employees, and agents shall not be liable for any claims, liabilities, penalties, fines or any damage to property, whether real or personal, nor for any personal injury or death caused by, or resulting from, or claimed to have been caused by or resulting from, any negligence, recklessness, or willful misconduct of Consultant. To the extent permitted by law, Consultant shall hold harmless, defend at its own expense, and indemnify SAWPA, its directors, officers, employees, and authorized volunteers, against any and all liability, claims, losses, damages, or expenses, including reasonable attorney's fees and costs, arising from all acts or omissions of Consultant or its officers, agents, or employees in rendering services under this Agreement and any Task Order issued hereunder; excluding, however, such liability, claims, losses, damages or expenses arising from SAWPA's sole negligence or willful acts.

4.06 In the event that SAWPA requests that specific employees or agents of Consultant supervise or otherwise perform the services specified in each Task Order, Consultant shall ensure that such individual(s) shall be appointed and assigned the responsibility of performing the services.

4.07 In the event Consultant is required to prepare plans, drawings, specifications and/or estimates, the same shall be furnished with a registered professional engineer's number and shall conform to local, state and federal laws, rules and regulations. Consultant shall obtain all necessary permits and approvals in connection with this Agreement, any Task Order or Change Order. However, in the event SAWPA is required to obtain such an approval or permit from another governmental entity, Consultant shall provide all necessary supporting documents to be filed with such entity, and shall facilitate the acquisition of such approval or permit.

4.08 Consultant shall comply with all local, state and federal laws, rules and regulations including those regarding nondiscrimination and the payment of prevailing wages, if required by law.

ARTICLE V

SAWPA OBLIGATIONS

5.01 SAWPA shall:

5.01a Furnish all existing studies, reports and other available data pertinent to each Task Order that are in SAWPA's possession;

5.01b Designate a person to act as liaison between Consultant and the General Manager and Commission of SAWPA.

ARTICLE VI

ADDITIONAL SERVICES, CHANGES AND DELETIONS

6.01 During the term of this Agreement, the Commission of SAWPA may, from time to time and without affecting the validity of this Agreement or any Task Order issued pursuant thereto, order changes, deletions, and additional services by the issuance of written Change Orders authorized and approved by the Commission of SAWPA.

6.02 In the event Consultant performs additional or different services than those described in any Task Order or authorized Change Order without the prior written approval of the Commission of SAWPA, Consultant shall not be compensated for such services.

6.03 Consultant shall promptly advise SAWPA as soon as reasonably practicable upon gaining knowledge of a condition, event, or accumulation of events, which may affect the scope and/or cost of services to be provided pursuant to this Agreement. All proposed changes, modifications, deletions, and/or requests for additional services shall be reduced to writing for review and approval or rejection by the Commission of SAWPA.

6.04 In the event that SAWPA orders services deleted or reduced, compensation shall be deleted or reduced by a comparable amount as determined by SAWPA and Consultant shall only be compensated for services actually performed. In the event additional services are properly authorized, payment for the same shall be made as provided in Article III above.

ARTICLE VII

CONSTRUCTION PROJECTS: CONSULTANT CHANGE ORDERS

7.01 In the event SAWPA authorizes Consultant to perform construction management services for SAWPA, Consultant may determine, in the course of providing such services, that a Change Order should be issued to the construction contractor, or Consultant may receive a request for a Change Order from the construction contractor. Consultant shall, upon receipt of any requested Change Order or upon gaining knowledge of any condition, event, or accumulation of events, which may necessitate issuing a Change Order to the construction contractor, promptly consult with the liaison, General Manager and Commission of SAWPA. No Change Order shall be issued or executed without the prior approval of the Commission of SAWPA.

ARTICLE VIII

TERMINATION OF AGREEMENT

8.01 In the event the time specified for completion of an assigned task in a Task Order exceeds the term of this Agreement, the term of this Agreement shall be automatically extended for such additional time as is necessary to complete such Task Order and thereupon this Agreement shall automatically terminate without further notice.

8.02 Notwithstanding any other provision of this Agreement, SAWPA, at its sole option, may terminate this Agreement at any time by giving 10 day written notice to Consultant, whether or not a Task Order has been issued to Consultant.

8.03 In the event of termination, the payment of monies due Consultant for work performed prior to the effective date of such termination shall be paid after receipt of an invoice as provided in this Agreement.

ARTICLE IX

CONSULTANT STATUS

9.01 Consultant shall perform the services assigned by SAWPA in Consultant's own way as an independent contractor, in pursuit of Consultant's independent calling and not as an employee of SAWPA. Consultant shall be under the control of SAWPA only as to the result to be accomplished and the personnel assigned to perform services. However, Consultant shall regularly confer with SAWPA's liaison, General Manager, and Commission as provided for in this Agreement.

9.02 Consultant hereby specifically represents and warrants to SAWPA that the services to be rendered pursuant to this Agreement shall be performed in accordance with the standards customarily applicable to an experienced and competent professional consulting organization rendering the same or similar services. Furthermore, Consultant represents and warrants that the individual signing this Agreement on behalf of Consultant has the full authority to bind Consultant to this Agreement.

ARTICLE X

AUDIT AND OWNERSHIP OF DOCUMENTS

10.01 All draft and final reports, plans, drawings, specifications, data, notes, and all other documents of any kind or nature prepared or developed by Consultant in connection with the performance of services assigned to it by SAWPA are the sole property of SAWPA, and Consultant shall promptly deliver all such materials to SAWPA. Consultant may retain copies of the original documents, at its option and expense. Use of such documents by SAWPA for project(s) not the subject of this Agreement shall be at SAWPA's sole risk without legal liability or exposure to Consultant. SAWPA agrees to not release any software "code" without prior written approval from the Consultant.

10.02 Consultant shall retain and maintain, for a period not less than four years following termination of this Agreement, all time records, accounting records, and vouchers and all other records with respect to all matters concerning services performed, compensation paid and expenses reimbursed. At any time during normal business hours and as often as SAWPA may deem necessary, Consultant shall make available to SAWPA's agents for examination of all such records and will permit SAWPA's agents to audit, examine and reproduce such records.

ARTICLE XI

MISCELLANEOUS PROVISIONS

11.01 This Agreement supersedes any and all previous agreements, either oral or written, between the parties hereto with respect to the rendering of services by Consultant for SAWPA and contains all of the covenants and agreements between the parties with respect to the rendering of such services in any manner whatsoever. Any modification of this Agreement will be effective only if it is in writing signed by both parties.

11.02 Consultant shall not assign or otherwise transfer any rights or interest in this Agreement without the prior written consent of SAWPA. Unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under this Agreement.

11.03 In the event Consultant is an individual person and dies prior to completion of this Agreement or any Task Order issued hereunder, any monies earned that may be due Consultant from SAWPA as of the date of death will be paid to Consultant's estate.

11.04 Time is of the essence in the performance of services required hereunder. Extensions of time within which to perform services may be granted by SAWPA if requested by Consultant and agreed to in writing by SAWPA. All such requests must be documented and substantiated and will only be granted as the result of unforeseeable and unavoidable delays not caused by the lack of foresight on the part of Consultant.

11.05 SAWPA expects that Consultant will devote its full energies, interest, abilities and productive time to the performance of its duties and obligations under this Agreement, and shall not engage in any other consulting activity that would interfere with the performance of Consultant's duties under this Agreement or create any conflicts of interest. If required by law, Consultant shall file a Conflict of Interest Statement with SAWPA.

11.06 Any dispute which may arise by and between SAWPA and the Consultant, including the Consultants, its employees, agents and subcontractors, shall be submitted to binding arbitration. Arbitration shall be conducted by a neutral, impartial arbitration service that the parties mutually agree upon, in accordance with its rules and procedures. The arbitrator must decide each and every dispute in accordance with the laws of the State of California, and all other applicable laws. Unless the parties stipulate to the contrary prior to the appointment of the arbitrator, all disputes shall first be submitted to non-binding mediation conducted by a neutral, impartial mediation service that the parties mutually agree upon, in accordance with its rules and procedures.

11.07 During the performance of the Agreement, Consultant and its subcontractors shall not unlawfully discriminate, harass, or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, physical disability (including HIV and AIDS), mental disability, medical condition (cancer), age (over 40), marital status and denial of family care leave. Consultant and its subcontractors shall insure that the evaluation and treatment of their employees and applicants for employment are free from such discrimination and harassment. Consultant and its subcontractors shall comply with the provisions of the Fair Employment and Housing Act (Government Code, Section 12290 et seq.) and the applicable regulations promulgated there under (California Code of Regulations, Title 2, Section 7285 et seq.). The applicable regulations of the Fair Employment and Housing Commission implementing Government Code Section 12990 et seq., set forth in Chapter 5 of Division 4 of Title 2 of the California Code of Regulations, are incorporated into this Agreement by reference and made a part hereof as if set forth in full. Consultant and its subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement. Consultant shall include the

Page Intentionally Blank



**SANTA ANA WATERSHED PROJECT AUTHORITY
TASK ORDER NO. AAWA320-03-01**

CONSULTANT: Albert A. Webb Associates
3788 McCray Street
Riverside, CA 92506

VENDOR NO.: 1238

COST: \$127,294.00

PAYMENT: Upon Receipt of Proper Invoice

REQUESTED BY: David Ruhl, Executive Manager of Engineering
and Operations

December 2, 2025

FINANCE: _____
Alison Lewis, Controller Date

FINANCING SOURCE: Acct. Coding: 320-03ABPRA-6210-01
Acct. Description: Engineering – General

COMMITTEE AUTHORIZATION REQUIRED FOR THIS TASK ORDER: YES (X) NO ()
Authorization: December 2, 2025; PA24#2025.23

This Task Order is issued upon approval and acceptance by the Santa Ana Watershed Project Authority (SAWPA) and Albert A. Webb Associates (Consultant) pursuant to the General Services Agreement between SAWPA and Consultant, entered into on December 2, 2025, expiring December 31, 2028.

I. PROJECT NAME OR DESCRIPTION

Brine Line Reach IV-B Lower Maintenance Access Structures

II. SCOPE OF WORK / TASKS TO BE PERFORMED

Consultant shall provide all labor, materials, and equipment for the Brine Line Reach IV-B Lower Maintenance Access Structures as described in the attached scope of work.

III. PERFORMANCE TIME FRAME

Consultant shall begin work December 16, 2025, and shall complete performance of such services by **December 31, 2026.**

IV. SAWPA LIAISON

David Ruhl shall serve as liaison between SAWPA and Consultant.

V. COMPENSATION

For all services rendered by Consultant pursuant to this Task Order, Consultant shall receive a total not-to-exceed sum of **\$127,294.00**. Payment for such services shall be made monthly upon receipt of timely and proper invoices from Consultant, as required by the above-mentioned Agreement. Each such invoice shall be provided to SAWPA by Consultant within 15 days after the end of the month in which the services were performed. All such invoices shall be sent via-email to Apinvoices@sawpa.gov, or as otherwise directed in writing by SAWPA.

VI. CONTRACT DOCUMENTS PRECEDENCE

In the event of a conflict in terms between and among the contract documents herein, the document item highest in precedence shall control. The precedence shall be:

- a. The General Services Agreement by Independent Consultant/Consultant.
- b. The Task Order or Orders issued pursuant to the Agreement, in numerical order.
- c. Exhibits attached to each Task Order, which may describe, among other things, the Scope of Work and compensation therefore.
- d. Specifications incorporated by reference.
- e. Drawings incorporated by reference.

In witness whereof, the parties have executed this Task Order on the date indicated below.

SANTA ANA WATERSHED PROJECT AUTHORITY

Karen Williams, General Manager	Date
---------------------------------	------

ALBERT A. WEBB ASSOCIATES

(Signature) _____ Date _____

Print/Type Name and Title

SCOPE OF SERVICES

WEBB acknowledges the scope of work as shown in the RFP and is committed to completing all of the tasks as listed in the RFP. The following scope of work only highlights key issues and critical work tasks for this project. We have also noted areas where WEBB deems additional tasks are necessary for a complete project scope.

TASK 1 - PROJECT MANAGEMENT AND QUALITY ASSURANCE/QUALITY CONTROL:

This task establishes the foundation for successful project execution. WEBB will ensure that all stakeholders are aligned from the outset through a structured kick-off meeting. The QA/QC process will be tailored to meet industry standards and SAWPA's requirements, ensuring that all deliverables are accurate, timely, and of high quality. Regular communication and documentation will promote transparency and accountability throughout the project lifecycle.

WEBB will hold a project kick-off meeting to outline our approach, schedule, and information request for SAWPA and obtain feedback on SAWPA's critical success factors for this project. These essential success factors might include design schedule, RCFC Permitting Requirements, or a construction plan to maintain brine flow during construction. WEBB will also confirm project contact, communication methods for updates, and issue resolution. WEBB will organize and conduct the appropriate QA/QC for this project.

WEBB will provide clear and concise communication with the Bi-Weekly project updates, phone calls, monthly status reports, QA/QC for the project, and appropriate budget control and invoices. WEBB will prepare materials and participate in coordination calls to keep the project on track and address issues promptly.

Two workshops are anticipated, preliminary design and 95% design to facilitate collaboration and decision-making. WEBB will prepare agendas and presentations for the two workshops to receive input and coordinate schedules for the workshops.

- **Task 1 Deliverables:** Kick-off Meeting agenda, Monthly Status reports, QA/ QC, meeting and workshop agendas and minutes

TASK 2 – PERMITTING

WEBB will prepare permit applications for a modified encroachment permit with RCFC. WEBB will fill out forms, make initial contact with RCFC staff to discuss the project, prepare and submit plans to RCFC suitable for initial review, respond to RCFC comments and coordinate approval of the proposed work. Issues we anticipate needing to resolve with RCFC are: 1) allowable construction footprint impacting their maintenance road, 2) access restrictions based on anticipated weather / rain fall, 3) nothing above grade following construction that might inhibit their maintenance access.

A City of Corona encroachment permit will be required if the bypass pipeline has to cross either

Joy Street or Harrison Street. We have included budget for applying for this permit and coordinating with the City's water department for crossing over the 12-in water pipeline in Joy Street.

Another option for the bypass pipeline is a highline crossing on top of both Joy and Harrison Streets. This approach would require simultaneous road closures and a very limited work window, possibly night or weekend work.

We have included budget for an optional task for traffic control plans with the City of Corona. If the construction of the MASs can be accomplished with a live pipeline and no bypass, then traffic control plans will not be necessary. If bypass is required, crossings of both Joy Street and Harrison Street will likely be required unless the temporary bypass pipelines can cross under the bridges within the flood control channel itself. If bypass pipelines must cross both Joy and Harrison Streets, SAWPA should consider keeping the bypass pipelines to facilitate future bypassing.

- **Task 2 Deliverables:** Permits (RCFC and possibly City of Corona)

TASK 3 – SURVEY

Our survey work is based obtaining field topographic survey for three locations within the Riverside County Flood Control Right-of-Way, each location extending to 100± feet in length, and covering a width from the Right-of-Way to the edge of south side of the existing channel. Mapping of the right-of-way will be based on available record data. Survey for 10 pothole locations up to is also included.

WEBB intends to use GIS data for the mapping required for the bypass plan and the optional traffic control plans to keep the survey costs to a minimum.

- **Task 3 Deliverables:** Survey files suitable for use in the design phase

TASK 4 – UTILITY COORDINATION

WEBB will contact the utility companies and agencies to obtain atlas maps and as-built plans of their facilities and locations, size, and depth of the facilities within the project area. Our project manager and project engineer will review the project area in detail looking for additional evidence of underground utilities such as new trench lines in the pavement and risers. All utility information received will then be added to the project base maps. In addition, identification of abandoned facilities will be included in the research.

WEBB will work with SAWPA and their potholing on-call contractor. We anticipate up to 10 potholes might be required. SAWPA's potholing on-call contractor will determine the vertical and horizontal location potential utilities. Pothole activities will not start until the potholing exhibit has been reviewed and approved by SAWPA. WEBB will make a site visit once the dig alert markings have been completed to pick up all the field markings from the dig alert and update the base maps. Per Task 3, WEBB will collect the potholing data and

input into the design files.

- **Task 4 Deliverables:** Existing Utility Maps, Potholing Exhibit

TASK 5 – PRELIMINARY DESIGN (35%) AND PRELIMINARY DESIGN MEMORANDUM

WEBB will conduct a comprehensive field walk of the project to understand the existing conditions, documenting findings through notes and photographs.

The Preliminary Design Memorandum will consolidate all findings and provide a roadmap for the detailed final design. It will address technical, environmental, and community considerations, ensuring that the project is feasible and aligned with SAWPA's goals. Stakeholder engagement at this stage will help refine the scope and mitigate risks.

WEBB will investigate and develop requirements for the preliminary design and document our findings in the Preliminary Design Memorandum. A variety of topics will be included as follows:

1. 35% Plans for the replacements
2. Materials and Appurtenances for the project, including a list of technical specifications and standards that will apply
3. Identify permit requirements and anticipated conditions
4. Construction Sequencing and Bypass Plan to maintain flows without a shutdown
5. Safety Considerations for construction and future operation
6. Environmental Concerns and Setting, and anticipated clearances required (CEQA documentation is not included; anticipate a notice of exemption is the appropriate level of documentation needed.)
7. Traffic Issues for access to the RCFC maintenance roads
8. Constraints Analysis of the above topics
9. Cost Estimates
10. Construction Schedule

WEBB will hold a workshop with SAWPA stakeholders to present the project and solicit input and feedback on the above topics. WEBB will prepare a PowerPoint® presentation to facilitate the meeting agenda topics and work closely with SAWPA engineering staff to ensure all issues are addressed adequately at this stage of project development.

WEBB will identify actions needed during the final design phase to implement the project. WEBB will prepare a draft PDR for the District's review. A final PDR will be submitted, fully addressing and incorporating SAWPA's comments.

- **Task 5 Deliverables:** Draft PDM, Comment Response Log, Final PDM, in PDF, also in word for the memorandum and Autocad files for drawings

TASK 6 – FINAL DESIGN

Advancing the design to 95% and then Final involves refining technical details and incorporating stakeholder feedback. WEBB will ensure that plans, specifications, and cost estimates reflect the latest requirements and standards. A review workshop will validate design decisions and prepare the team for finalization.

The design team will revise the preliminary design/35% plans to incorporate all SAWPA comments into the 95% submittal. Any special details will be incorporated and included in the plans along with draft specifications conforming to SAWPA standards for agency review. The preliminary cost estimate will be updated to reflect changes made to the plans based on 95% of the details. The 95% deliverable will be reviewed with SAWPA in a workshop, and all input and action items will be tracked and addressed for the following submittal. The following items will be advanced per the following details:

► Plans

WEBB will prepare individual drawings for each maintenance access structure and preparing a new Title Sheet, Index Map, and Details per SAWPA Standards using the typical AutoCAD software.

Additional GIS-based mapping will be created and used for exhibits in the specification appendices and incorporated into the index mapping to ensure enough detail is provided to identify the work requirements.

► Specifications

WEBB will prepare draft specifications based on SAWPA standard sections and customized sections as needed based on the sections identified in the preliminary design.

► Cost Estimates and Construction Schedule

WEBB will prepare cost estimates and updated construction schedule based on the 95% plans.

The final design package will be completed and formatted for bidding. WEBB will ensure that all documentation is accurate, comprehensive, and compliant with SAWPA standards. This deliverable marks the transition from design to construction.

The 90% plans, specifications, cost estimates and construction schedule will be advanced to 100% and address all District comments received.

- **Task 6 Deliverables:** 95% plans, specifications and cost estimates, construction schedule and Final plans and specifications signed and ready for bidding

EXCLUSIONS:

- CEQA documentation and analysis
- Bidding Support Services
- Construction Support Services
- Tasks not explicitly listed above or in the RFP

OPTIONAL TASK

▶ Traffic Control Plans

WEBB will prepare a conceptual traffic control plan based on the options selected. WEBB will meet with the City to introduce the project and provide context and options to the City prior to preliminary review.

WEBB will request feedback from the City on what is allowable and what is required so that the 95% plans can be prepared and submitted with greater certainty for City approval. WEBB will submit the 95% plans for City review and provide signed plans once all of the issues are addressed.

- **Deliverables:** Conceptual, 95% and Final Traffic Control Plans

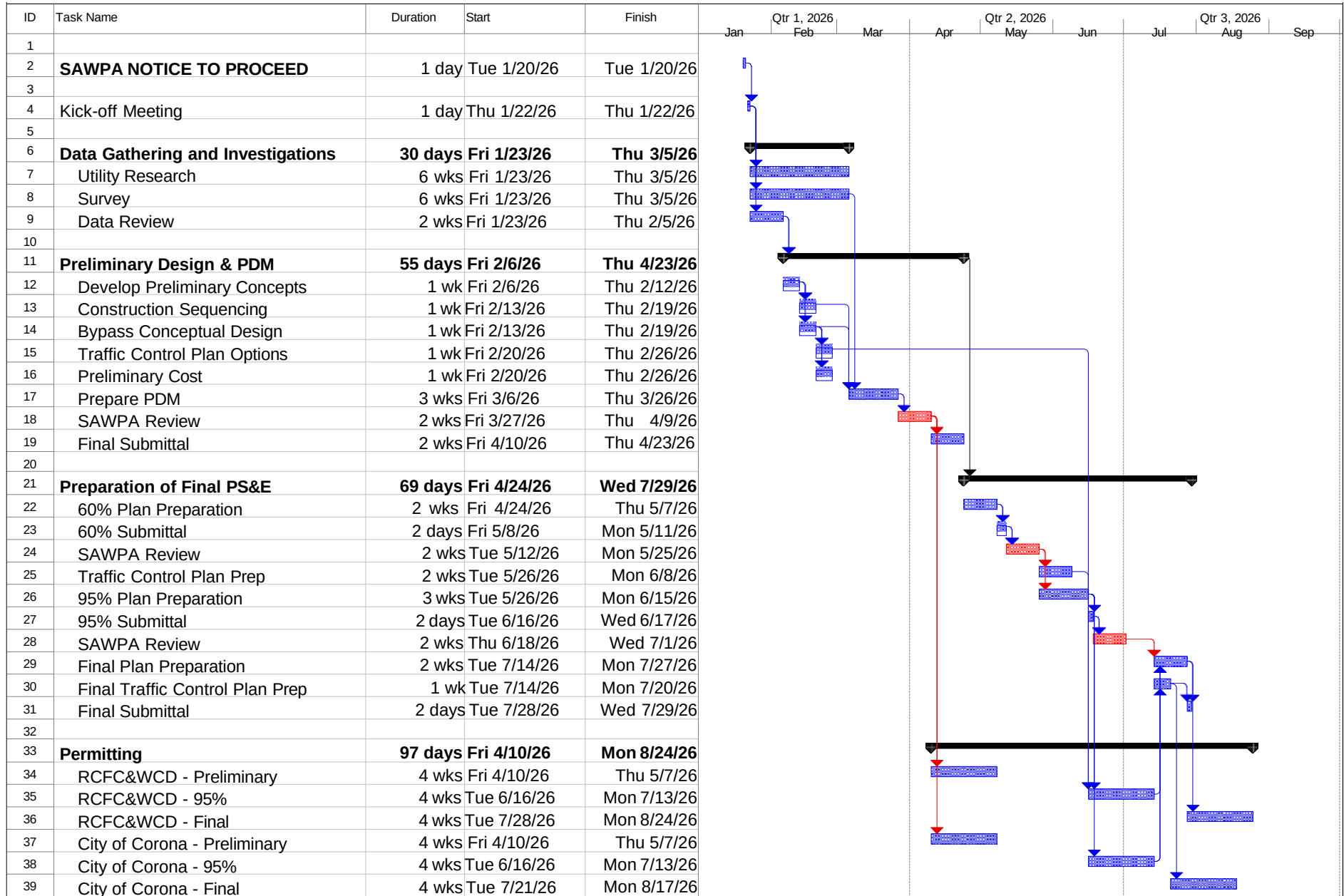
FEE PROPOSAL

Item	Description	Jeff T. Hart, Principal II	Tyler J. Vigneault, Associate I	Mark Tolmachoff, Assistant III	Shane Bloomfield, Principal II	Alexandra N. Frey, Project Coordinator	Jaimee Bourgeois, Principal II	Ingrid T. Mar, Senior I	Jason Ardery, Principal II	Michael E. Johnson, Principal II	Jon Ros, Senior II	Andres Lopez, Senior II	Riley Skvarca, Assistant V	Asia Lazo, Project Coordinator	2-Man Survey Party	Total Hours	Subtotal - Labor	Expenses	Total/task ¹
	Billout Rate	\$ 331	\$ 232	\$ 173	\$ 331	\$ 150	\$ 331	\$ 276	\$ 331	\$ 331	\$ 286	\$ 286	\$ 210	\$ 150	\$ 356				
	Task 1 - Project Management	9	46		3	50										108	\$ 22,144	\$ -	\$ 22,144
1.1	Kick off Meeting	1	2		1	2										6	\$ 1,426		\$ 1,426
1.2	Status Reports	4	4			8										16	\$ 3,452		\$ 3,452
1.3	Bi-Weekly Conference Calls		16			16										32	\$ 6,112		\$ 6,112
1.4	Workshop - Preliminary Design	1	4		1	4										10	\$ 2,190		\$ 2,190
1.5	Workshop - 95% Design	1	4		1	4										10	\$ 2,190		\$ 2,190
1.6	Project Management	2	16			16										34	\$ 6,774		\$ 6,774
	Task 2 - Permitting		6	4		16										26	\$ 4,484	\$ -	\$ 4,484
2.1	Permit Applications		2	4		8										14	\$ 2,356		\$ 2,356
2.2	Permit Coordination		4			8										12	\$ 2,128		\$ 2,128
	Task 3 - Survey		2						2	4	18	6	7	3	16	58	\$ 16,930	\$ 63	\$ 16,993
3.1	Topographic Mapping		1						1		2	3	5	1	8	21	\$ 6,041	\$ 21	\$ 6,062
3.2	RCFC Right-of-Way Mapping								1	4	16	1		1	4	27	\$ 8,091	\$ 21	\$ 8,112
3.3	Pothole Survey		1									2	2	1	4	10	\$ 2,798	\$ 21	\$ 2,819
	Task 4 - Utility Coordination		2	6		9										17	\$ 2,852	\$ -	\$ 2,852
4.1	Utility Research			1		8										9	\$ 1,373		\$ 1,373
4.2	Plotting Utilities		1	4												5	\$ 924		\$ 924
4.3	Pothole Coordination		1	1		1										3	\$ 555		\$ 555
	Task 5 - Preliminary Design & PDM	7	46	64	6	16										139	\$ 28,447	\$ -	\$ 28,447
5.1	Preliminary Design	4	40	60		16										120	\$ 23,384		\$ 23,384
5.2	Cost Estimate			4	1											5	\$ 1,023		\$ 1,023
5.3	Construction Schedule	1	4		1											6	\$ 1,590		\$ 1,590
5.4	QA / QC	2	2		4											8	\$ 2,450		\$ 2,450
	Task 6 - Final Design	8	70	92	6	28										204	\$ 40,990	\$ -	\$ 40,990
6.1	Prepare Drawings		36	60												96	\$ 18,732		\$ 18,732
6.2	Prepare Specifications	4	24	20		24										72	\$ 13,952		\$ 13,952
6.3	Update Construction Schedule	1	2	4												7	\$ 1,487		\$ 1,487
6.4	Update Cost Estimate	1	2	4												7	\$ 1,487		\$ 1,487
6.5	Final Submittal		2	4		4										10	\$ 1,756		\$ 1,756
6.6	QA / QC	2	4		6											12	\$ 3,576		\$ 3,576
Total		24	172	166	15	119			2	4	18	6	7	3	16	552	\$115,847	\$ 63	\$115,910

Optional Tasks			4			2	4	32								42	\$ 11,384	\$ -	\$ 11,384
O.1	Prepare Traffic Control Plans		4			2	4	32								42	\$ 11,384		\$ 11,384

1. Rounded to the nearest \$1

PROJECT SCHEDULE



Page Intentionally Blank

PA 24 COMMITTEE MEMORANDUM NO. 2025.24

DATE: December 2, 2025

TO: Project Agreement 24 Committee
(Inland Empire Brine Line)

SUBJECT: Brine Line Solids Imbalance and Billing Formula Update

PREPARED BY: Lucas Gilbert, Manager of Permitting and Pretreatment

RECOMMENDATION

Receive and file.

DISCUSSION

Trussell Technologies, Inc. (Trussell) first collaborated with SAWPA in 2011 to assess the nature and magnitude of the suspended solids formed in the Brine Line. SAWPA recovers costs paid to OC San using a billing formula to allocate the costs related to solids formation to each discharger. Trussell previously supported SAWPA in developing a monitoring program aimed at characterizing all discharger inputs and downstream water quality. System-wide concurrent monitoring was completed in April 2016, and from the monitoring data, Trussell developed a scientifically-based revision of the billing formula based on known formation mechanisms of the observed solids composition. SAWPA adopted this billing formula in July 2016. Trussell completed subsequent annual reviews of the monitoring data and billing formula parameters in 2017, 2018 and 2019, and no changes to the billing formula were recommended.

Since the 2019 review of the billing formula there have been changes in the flow characteristics of the Brine Line due to new discharges and increased flow. In addition, the solids imbalance has increased since 2019 when the billing formula was last reviewed. Due to these changes in the solids imbalance, the PA 24 Committee authorized staff in October of 2024 to coordinate with Trussell on an updated study of the solids imbalance and review the Billing Formula and make recommendations for changes as necessary. A draft report has been prepared by Trussell to document the findings and to provide recommendations for the Billing Formula.

The attached Draft Report was provided to Member Agency staff for review and comment. A representative from Trussell will be present at the PA 24 Committee meeting to provide a presentation on the findings and recommendations of the Draft Report. A summary of the recommendations from the Draft Report are as follows:

- Adopt newly revised billing formula
- Continue to Conduct Billing Monitoring
- Continue Solids Characterization review at the SARI Metering Station

Next Steps

- Receive comments from PA 24 Committee Members and Member Agency staff
- Conduct a workshop with Member Agency staff and Brine Line dischargers
- Incorporate comments into Final Report
- Present Final Report and recommendations to the PA 24 Committee at a future meeting

- Implement any approved changes to the billing formula that may go into effect with the July 2026 invoices.

RESOURCE IMPACTS

Funds to cover the Brine Line Billing Formula Update are included in the Fiscal Year 25-26 Budget Fund 240 (Brine Line Enterprise).

Attachments:

1. SAWPA PowerPoint Presentation
2. Trussell PowerPoint Presentation
3. Draft Trussell Brine Line Water Quality Monitoring & Solids Formation Recovery Formula Report, July 2019 – June 2025



Brine Line Solids Imbalance and Billing Formula Update

PA 24 Committee
Agenda Item No. 6.B
Lucas Gilbert

Manager of Permitting and Pretreatment
December 2, 2025

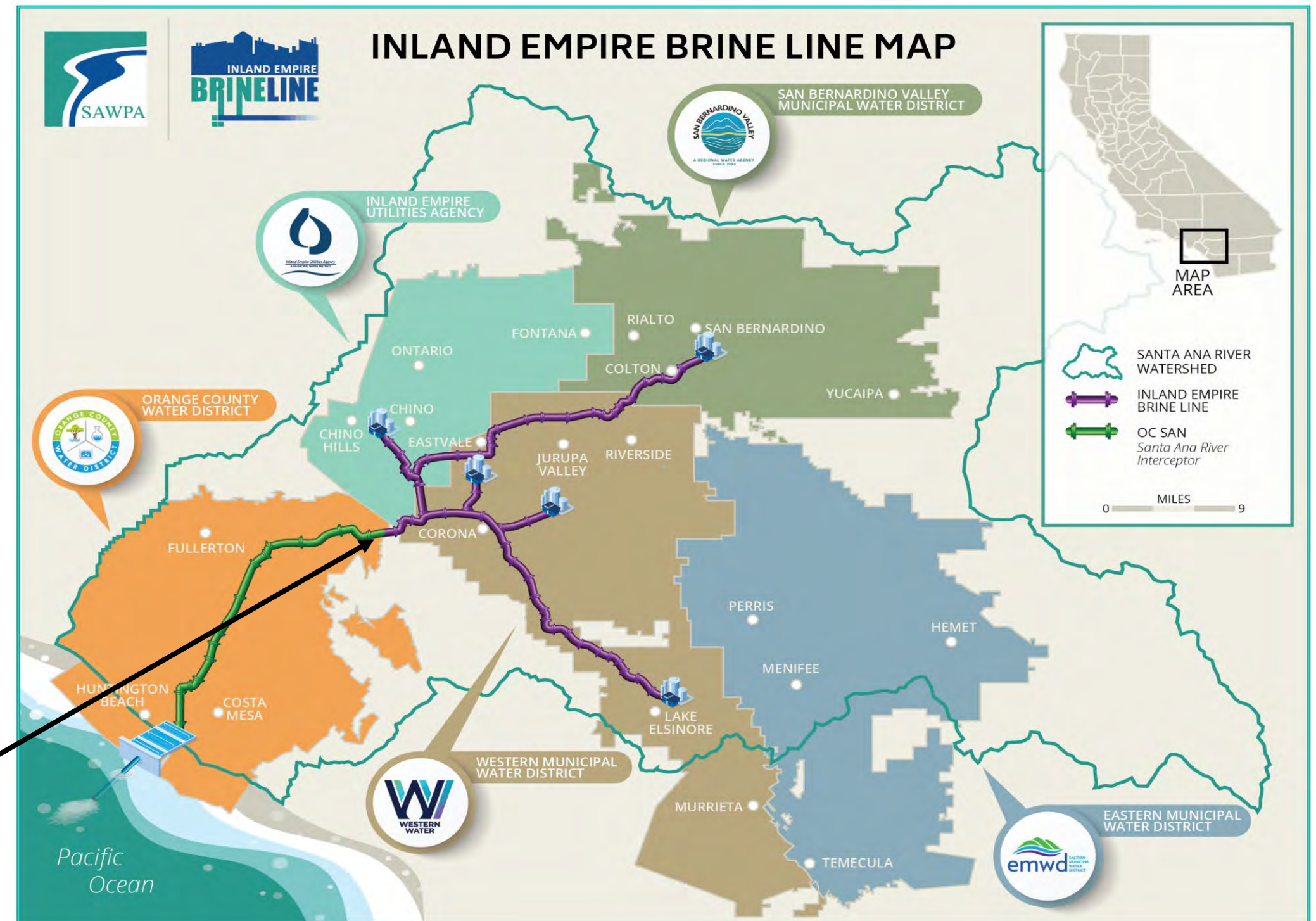
Recommendation

- Receive and file

SARI Metering Station (SMS)

SAWPA recovers costs paid to OC San, from monitoring conducted at SMS, using a billing formula to allocate the costs related to solids formation from each discharger

SARI Metering Station



Background

- The solids formation creates an imbalance in the Total Suspended Solids (TSS) and Biochemical Oxygen Demand (BOD) measured at the SMS versus the dischargers input
- To account for the imbalance, in 2016 SAWPA developed a scientifically-based revision of the previous Billing Formula based on known formation mechanisms of the observed solids composition
- In July 2016, the SAWPA Commission adopted this revised Billing Formula
- SAWPA continues to implement the Billing Formula following subsequent annual reviews of the monitoring data and billing formula parameters in 2017, 2018 and 2019

Brine Line Billing Formula (current)

$$TSS_b = TSS_m + TSS_f * \left[\frac{dBOD_m}{dBOD_t} * (0.31) + \frac{Calcium_m}{Calcium_t} * (0.28) + \frac{Alkalinity_m}{Alkalinity_t} * (0.41) \right]$$

BOD Load	Calcium Load	Alkalinity Load
---------------------	-------------------------	----------------------------

Where:

- TSS_b = Billed TSS to discharger
- TSS_m = Measured TSS for discharger
- TSS_f = Formed TSS in Brine Line (calculated)
- $dBOD_m$ = Dissolved BOD measured for discharger
- $dBOD_t$ = Total dissolved BOD measured for all dischargers
- $Calcium_m$ = Dissolved calcium measured for discharger
- $Calcium_t$ = Total dissolved calcium measured for all dischargers
- $Alkalinity_m$ = Dissolved alkalinity measured for discharger
- $Alkalinity_t$ = Total dissolved alkalinity measured for all dischargers

Background

- Since the 2019 review of the billing formula there have been changes in the flow characteristics of the Brine Line due to new discharges and increased flow. In addition, the solids imbalance has increased since 2019 when the billing formula was last reviewed
- Due to these changes in the solids imbalance, the PA 24 Committee authorized staff in October of 2024 to coordinate with Trussell on an updated study of the solids imbalance and review the Billing Formula and make recommendations for changes as necessary
- A draft report has been prepared by Trussell to document the findings and to provide recommendations for the Billing Formula

Trussell Presentation

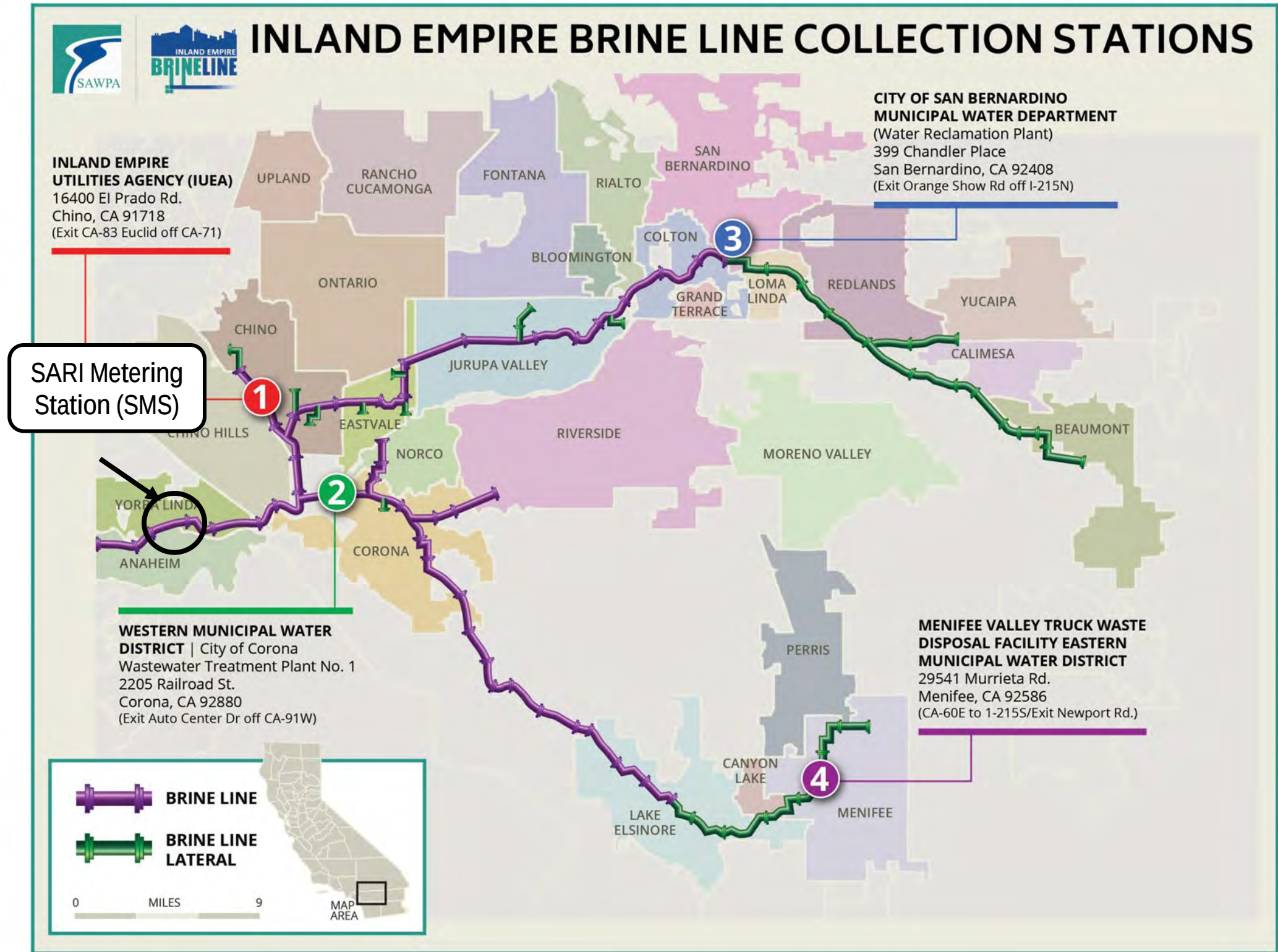
Update on Solids Formation in the Inland Empire Brine Line

Trussell

December 2, 2025
Emily Owens-Bennett, P.E., BCEE



Solids in Brine Line



Methodology

SS Out
(SMS)

—

SS In
(Combined Dischargers)

=

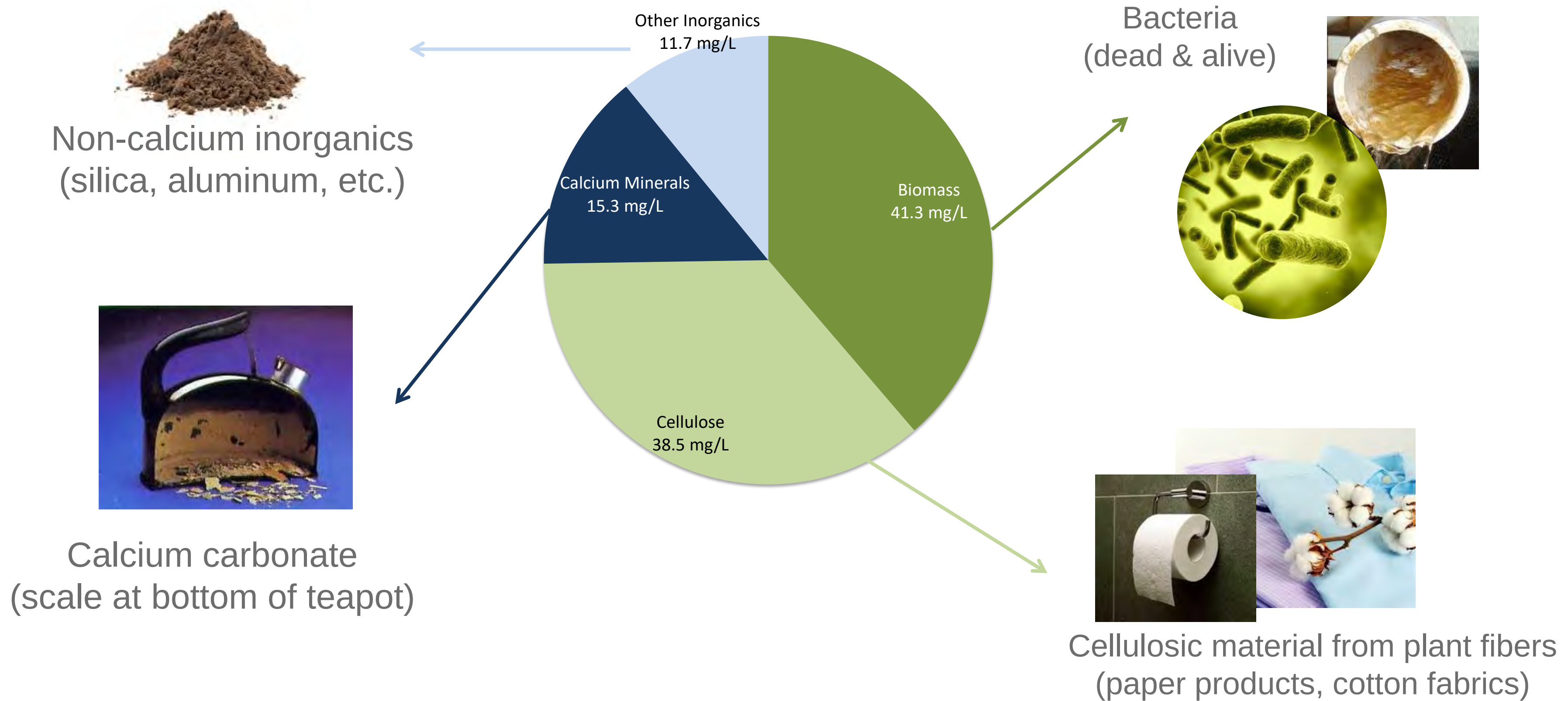
SS Formed
(within Brine Line)



Solids in Brine Line

*Values represent monthly average loading. When no monitoring occurred for an individual discharger in a month, surrounding average measurements were substituted.

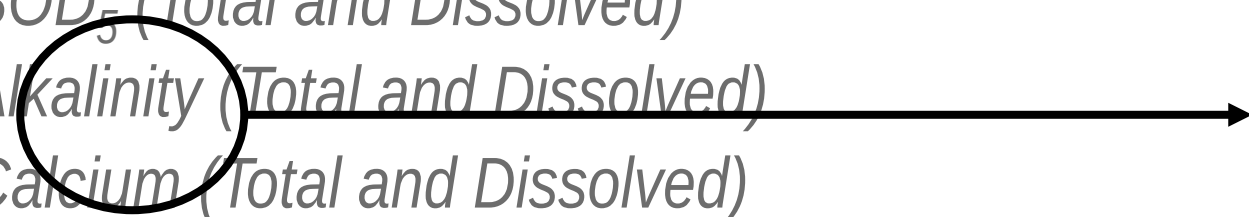
SMS Suspended Solids



Discharger Suspended Solids

- Supplemental Monitoring Parameters

- TSS
- VSS
- BOD_5 (Total and Dissolved)
- Alkalinity (Total and Dissolved)
- Calcium (Total and Dissolved)



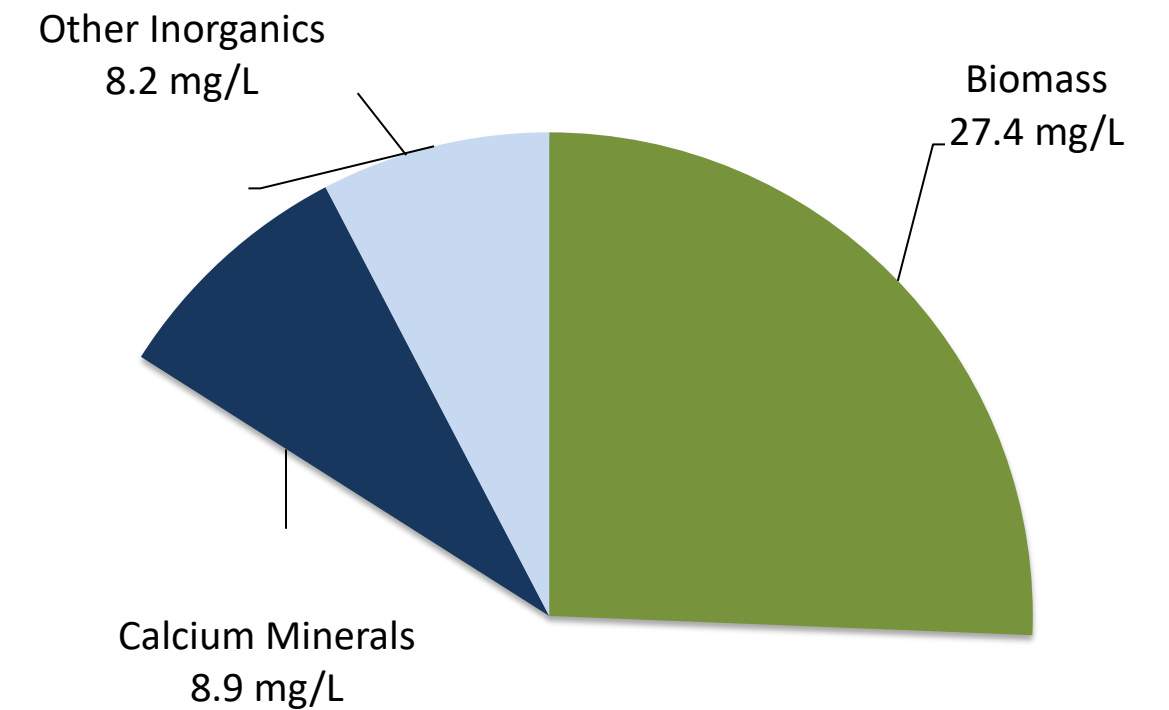
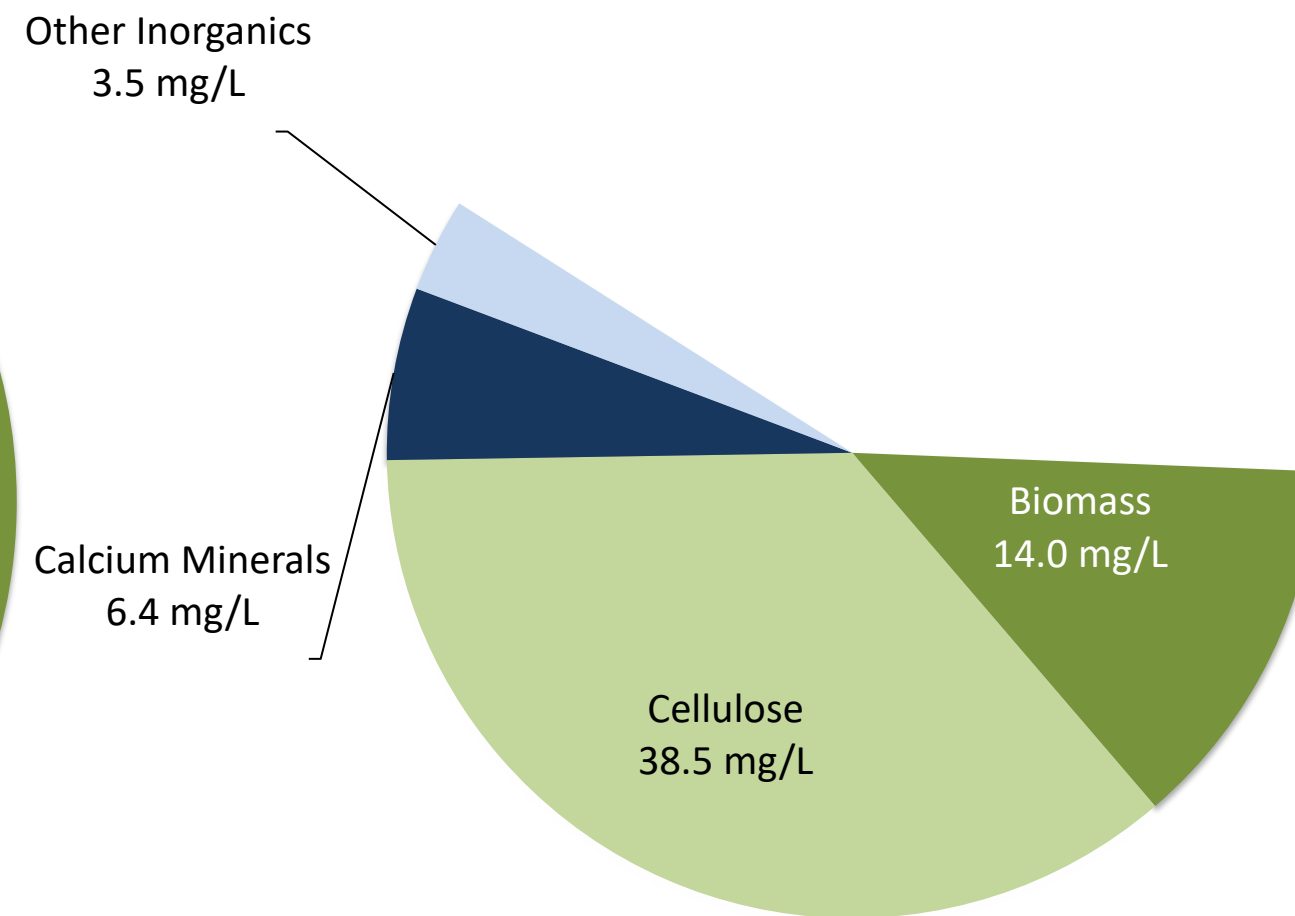
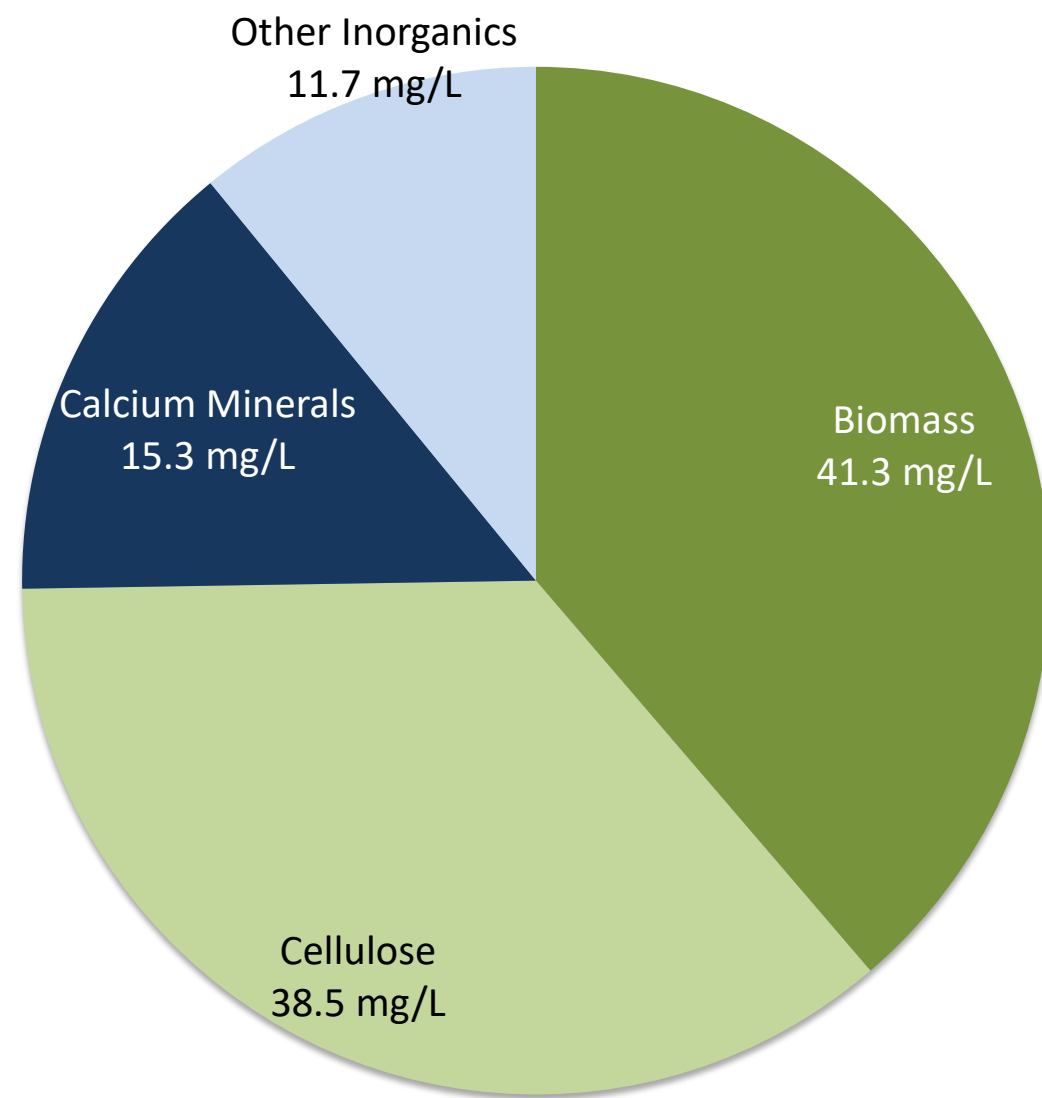
Methodology

SS Out: SMS

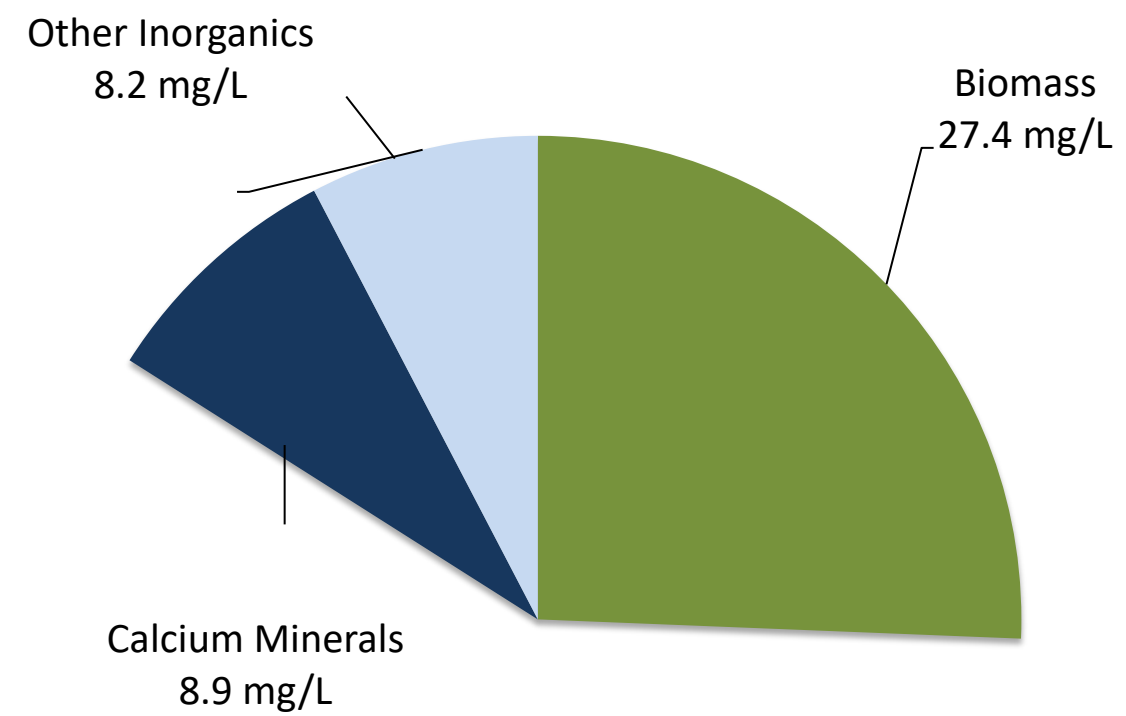
–

**SS In: Combined
Dischargers**

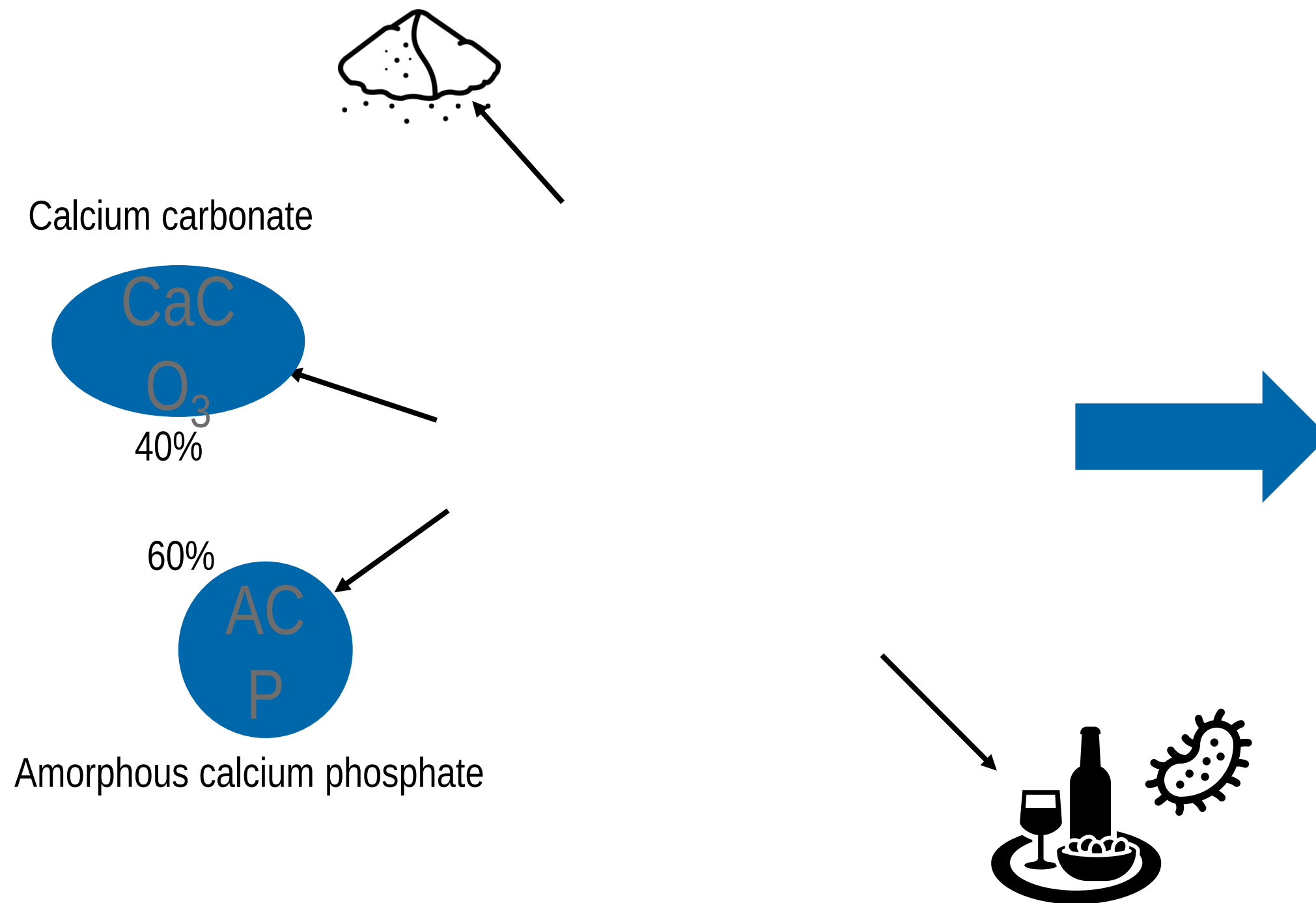
= SS Formed



Solids Formation Characterization



Solids Formation Characterization



Billing Formula

$$FF_{TSS} = \left[\frac{Calcium_m}{Calcium_t} \times (0.08) + \frac{Alkalinity_m}{Alkalinity_t} \times (0.12) + \frac{dBOD_m}{dBOD_t} \times (0.62) + \frac{Flow_m}{Flow_t} \times (0.18) \right]$$

Findings

- Brine Line flows have increased
- Suspended solids formation has increased recently
- Overall composition of solids in the Brine Line is similar over time

Recommendations

- Adopt new billing formula
- Continue to implement supplemental technical monitoring program
 - *Monitor flow and water quality from SMS and dischargers*
 - *Analyze all billing-related constituents from each sample*
- Characterize solids present at SMS
 - *Complete solids characterization events every 2 years*
 - *Consider additional events with significant changes in Brine Line system*



Thank you

Emily Owens-Bennett, PE
emilyo@trusselltech.com

Next Steps

- Receive comments from PA 24 Committee Members and Member Agency staff
- Conduct a workshop with Member Agency staff and Brine Line dischargers
- Incorporate comments into Final Report
- Present Final Report and recommendations to the PA 24 Committee at a future meeting
- Implement any approved changes to the billing formula that may go into effect with the July 2026 invoices

Recommendation

- Receive and File

Questions or Comments?

Lucas Gilbert
Santa Ana Watershed Project Authority
Office (951) 354-4245 | Cell (951) 415-5572
lgilbert@sawpa.gov
sawpa.gov



Page Intentionally Blank



SANTA ANA WATERSHED PROJECT AUTHORITY

Brine Line Water Quality Monitoring & Solids Formation Recovery Formula Report July 2019 – June 2025

DRAFT November 2025



Prepared by:

Trussell



Table of Contents

Table of Contents.....	i
List of Figures.....	iii
List of Tables.....	iv
1 Introduction	1-1
1.1 Project Objectives	1-2
2 Methodology	2-1
3 Results and Discussion of Current Reporting Period (2019 – 2025)	3-1
3.1 SMS Data Review	3-1
3.1.1 TSS Analysis.....	3-1
3.1.2 VSS Analysis.....	3-2
3.1.3 VSS/TSS Ratio.....	3-4
3.2 Discharger Data Review	3-5
3.2.1 Changes within the Brine Line System and Dischargers	3-6
3.2.2 Discharger Loading Rates.....	3-7
3.3 SMS and Discharger Loading Comparison.....	3-12
4 Results and Discussion of Recent Sampling Period (April 2025 – June 2025)	4-1
4.1 Introduction	4-1
4.2 SMS Assessment.....	4-1
4.3 Mass Balance Calculations	4-7
5 Billing Formula	5-1
5.1 Billing Formula Surrogates.....	5-1
5.2 Brine Line Billing Formula	5-3
6 Monitoring Program.....	6-1
6.1 SMS Solids Characterization Sampling	6-1
6.2 Discharger Solids Characterization Sampling.....	6-3
7 Findings and Recommendations	7-1
8 References.....	8-1
Appendix A – Trussell Communication with SAWPA, February 2025	9-1
Appendix B – Sampling Test Plan, February 2025.....	10-1
Appendix C – Top Dischargers Representing Top 75% of Overall Loading for Each Monitoring Parameter	11-1



Appendix D – Camet Research Lab Results for the Three Solids Characterization Events 12-1

Appendix E – Babcock Laboratories Results for the Three Solids Characterization Events 13-1



List of Figures

Figure 2-1. Characterization of solids formation through the Brine Line.....	2-1
Figure 3-1. Average TSS results at the SMS from individual sampling events (July 2016 – June 2025).....	3-1
Figure 3-2. Average TSS results at the SMS from individual sampling events (July 2019 – June 2025).....	3-2
Figure 3-3. Average VSS results at the SMS from individual sampling events (July 2016 – June 2025).....	3-3
Figure 3-4. Average VSS results at the SMS from individual sampling events (July 2019 – June 2025).....	3-3
Figure 3-5. VSS/TSS ratio at the SMS from individual sampling events (July 2019 – June 2025).....	3-5
Figure 3-6. Brine Line discharger suspended solids loading by category (July 2019 – June 2025).....	3-8
Figure 3-7. Cumulative flow from all dischargers compared with flow measured at SMS from July 2016 – June 2025.	3-13
Figure 3-8. Total suspended solids from all dischargers compared with the SMS from July 2016 – June 2025.	3-14
Figure 3-9. Relative increase in TSS in the Brine Line from the points of discharge to the SMS on a calendar year basis (July 2015 through June 2025).....	3-15
Figure 4-1. Average TSS results at the SMS from individual sampling events (April 2025 – June 2025).....	4-2
Figure 4-2. Average VSS results at the SMS from individual sampling events (April 2025 – June 2025).....	4-2
Figure 4-3. Three SMS solids characterizations performed in May 2025, using average VSS/TSS ratios determined from Camet and Babcock analyses.....	4-4
Figure 4-4. Overall composition of the Brine Line suspended solids at the SMS for April – June 2025 (loading represented as lbs/month)	4-5
Figure 4-5. Suspended solids characterizations from samples collected at the SMS 2016 – 2025 (loading values in lbs/month).....	4-6
Figure 4-6. Characterization of solids at SMS, of cumulative dischargers, and formation in Brine Line for April – June 2025	4-8
Figure 5-1. Overall composition of formed suspended solids for April – December 2018 and April – June 2025 estimates	5-1
Figure 5-2. Overall composition of formed suspended solids for April – December 2018 and April – June 2025 estimates, by monitoring surrogate	5-3



Figure 6-1. Example Schedule of SMS Weekly Monitoring Events and Solids Characterization Events	6-1
---	-----

List of Tables

Table 1-1. Timeframe Terminology	1-2
Table 3-1. Average TSS, VSS, and VSS/TSS ratios from SMS	3-4
Table 3-2. Summary of discharger loadings from recent data and comparison with last reporting period	3-9
Table 3-3. Summary of discharger average flow (million gallons per month) and loading rates (kgs/month) from July 2023 through June 2025	3-11
Table 4-1. Average VSS/TSS ratios of Babcock, Camet, and combined Babcock and Camet on the three solids characterization sample dates	4-4
Table 4-2. SMS solids composition based on solids characterizations (April – June 2025).....	4-5
Table 4-3. Brine Line system suspended solids composition based on mass balance (April 2025 – June 2025)	4-7
Table 5-1. Composition of solids formed in the Brine Line for April – December 2018 and April – June 2025.....	5-2
Table 6-1. Summary of monitoring plan at SMS	6-2
Table 6-2. Recommended ongoing sampling frequency for Brine Line dischargers	6-4



1 Introduction

The Inland Empire Brine Line is owned and operated by the Santa Ana Watershed Project Authority (SAWPA) and provides critical salinity management for the region by conveying primarily non-reclaimable wastes, including desalter concentrates and industrial wastewaters, from its upper reaches in Riverside and San Bernardino Counties to Orange County. Once the Brine Line crosses into Orange County (County Line), ownership of the wastewater is transferred from SAWPA to the Orange County Sanitation District (OC San). SAWPA pays OC San a monthly fee to dispose of the Brine Line wastewater, determined using the hydraulic flow and the level of total suspended solids (TSS) and biochemical oxygen demand (BOD₅) measured in the Brine Line at the County Line. Both agencies assess the County Line water quality using the Santa Ana Regional Interceptor (SARI) Monitoring Station (SMS), which is owned and maintained by OC San. Historically, the suspended solid load calculated from measurements at the SMS has exceeded the calculated cumulative suspended solids loads discharged to the Brine Line, suggesting solids formation through the system.

Trussell Technologies, Inc. (Trussell) was first retained by SAWPA in 2011 to characterize the suspended solids at the SMS and assess the nature of the suspended solids formed in the Brine Line (Trussell, 2011). SAWPA recovers costs paid to OC San by charging each discharger a fee using a billing formula that allocates the costs related to the solids formation. In response to an increase in Brine Line solids formation from 2014 through 2015, Trussell worked with SAWPA on a study aimed at characterizing solids from both discharger inputs and downstream water quality at SMS (Trussell, 2016a). The study focused on supplemental technical monitoring of select parameters related to solids formation. System-wide concurrent monitoring of the major dischargers, reach-by-reach locations, and SMS was completed between April 25 and 28, 2016. From the monitoring data, Trussell developed a revision of the billing formula to allocate the cost of suspended solids formation according to known formation mechanisms of the observed solids composition. Ongoing supplemental technical monitoring of these parameters was recommended to provide routine assessment of the suspended solids in the Brine Line and a mechanism for regularly updating the formula in response to system changes. This supplemental technical monitoring related to the assessment of solids formation in the Brine Line is separate from permit-required and compliance-based monitoring efforts. Subsequent evaluations of the Brine Line system solids were completed in a) 2017 for data collected from August 2016 through March 2017, b) 2018 for data collected from April 2017 through March 2018, and c) 2019 for data collected from April 2018 through March 2019.

Water quality and flow data from the SMS and from individual dischargers to the Brine Line collected from July 2019 through June 2024 were initially evaluated for the current Brine Line suspended solids assessment (see Appendix A). Supplemental technical monitoring was recommended to generate data that a) aligned all solids formation-related water quality parameters from representative samples collected from each



discharger and b) characterized the solids present at SMS (see Appendix B). This supplemental sampling campaign was completed from April through June 2025. These two periods were used in conjunction with findings from the previous reporting period (April-December 2018) to develop an updated understanding of the Brine Line suspended solids. Table 1-1 summarizes the time periods used in this report.

Table 1-1. Timeframe Terminology

Terminology	Timeframe
Current Reporting Period	July 2019 – June 2025, excluding July 2024 – March 2025
Recent Sampling Period	April 2025 – June 2025
Previous Reporting Period	April 2018 – December 2018

This technical memorandum (TM) provides an updated summary and analysis of the water quality results based on system-wide monitoring and characterization of the suspended solids entering and leaving the Brine Line from July 2019 through June 2025. The TM includes recommendations for next steps, including updates to the solids characterization methodology, building on the water quality assessments from 2016 to present.

1.1 Project Objectives

Primary objectives for this TM include:

- Provide an SMS water quality review for the current reporting period.
- Characterize the organic and inorganic constituents present in the suspended solids at the SMS.
- Develop loading rates for all individual dischargers using water quality parameters from the billing formula (monitoring plan constituents).
- Assess suspended solids loading within the Brine Line system – including the combined dischargers and the downstream SMS.
- Assess solids formation in the Brine Line system for the recent sampling period and its impact to the current billing formula.
- Compare results from the recent monitoring period with data generated from past monitoring periods (April 2016, August 2016 – March 2017, April 2017 – March 2018, April 2018 – March 2019) to re-assess the recommended monitoring frequencies for the individual dischargers and update, as needed (Trussell, 2016e; 2017; 2018; 2019).

2 Methodology

In order to allocate costs associated with suspended solids and solids formation within the Brine Line, characterization of the upstream combined discharger inputs and downstream water quality at the SMS was required. The formed suspended solids through the system were determined using the mass balance shown in Figure 2-1. This methodology is consistent with Trussell's 2016 Proposed Solids Formation Recovery Formula for the Inland Empire Brine Line (Trussell, 2016e), with updates from subsequent reports from 2017, 2018, and 2019 (Trussell, 2017; 2018; 2019).

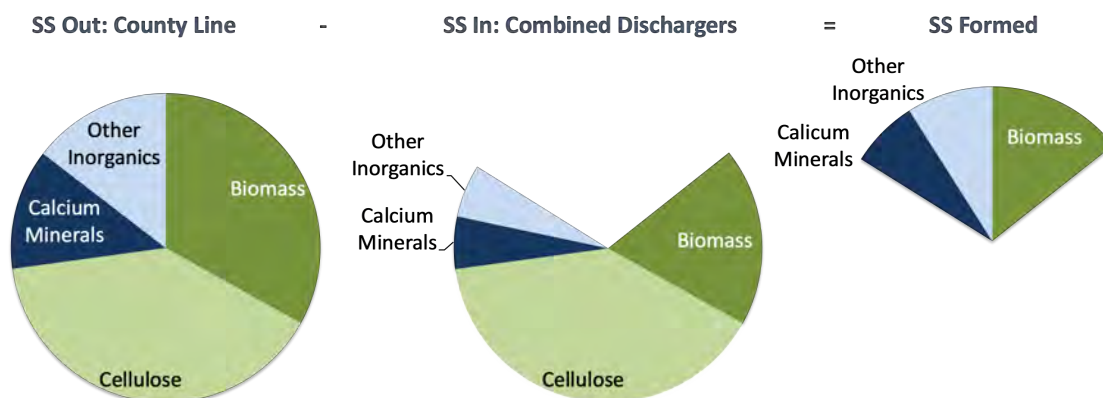


Figure 2-1. Characterization of solids formation through the Brine Line

The SMS monitoring data include results from weekly water quality samples and flow monitoring during the July 2019 through June 2025 period, as well as three solids characterization analyses that were performed on May 1, May 14, and May 29, 2025. Dischargers to the Brine Line were monitored for water quality parameters associated with solids formation mechanisms. The sampling frequencies for the period of July 2019 to June 2024 were determined based on loading values for each of the billing parameters determined from the 2019 Brine Line Study (Trussell, 2019). Then, from April 2025 to June 2025, dischargers were monitored for these water quality parameters at frequencies that were determined based on historical data and updated flow ranking.

3 Results and Discussion of Current Reporting Period (2019 – 2025)

The results of the water quality and flow data collection from the SMS and dischargers to the Brine Line of the current reporting period between July 2019 and June 2025 (excluding July 2024 through March 2025) are presented in the following section. The individual discharger flow and solids loading data are then summed for all dischargers and compared to the equivalent SMS data to understand long-term trends in the Brine Line.

3.1 SMS Data Review

To collect SMS water quality data, SAWPA collects weekly 24-hour composite samples from which triplicate analyses are completed for TSS, VSS, and total BOD₅, along with single replicate analysis of dissolved BOD₅, total and dissolved alkalinity, and total and dissolved calcium. OC San also performs monthly sampling and analysis of TSS and total BOD₅ at SMS to further characterize water quality at the SMS. The results of these SMS analyses are discussed in this section.

3.1.1 TSS Analysis

Figure 3-1 shows average TSS values from individual sampling events at the SMS from July 2016 through the current reporting period. The overall average of the individual average TSS values during this period was 103 mg/L. The linear trendline shown in Figure 3-1 (dotted blue line) indicates that TSS values at the SMS have decreased since July 2016.

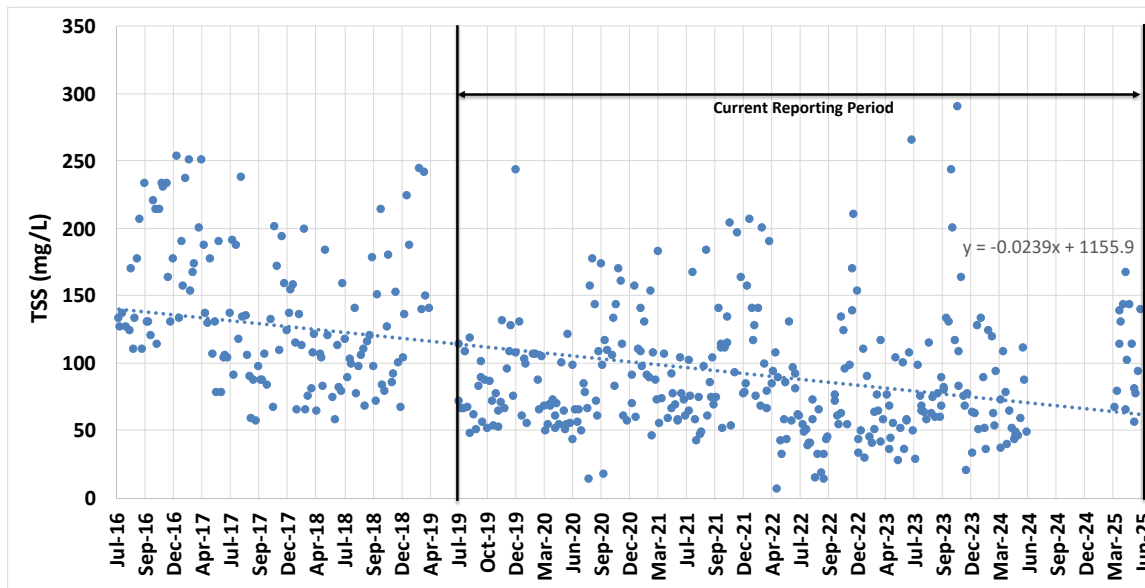


Figure 3-1. Average TSS results at the SMS from individual sampling events (July 2016 – June 2025)

Figure 3-2 shows the average TSS during only the current reporting period. As shown, the linear trendline of the current reporting period is much flatter than the trendline in Figure 3-2. The average TSS value at the SMS during the current reporting period was 86 mg/L.

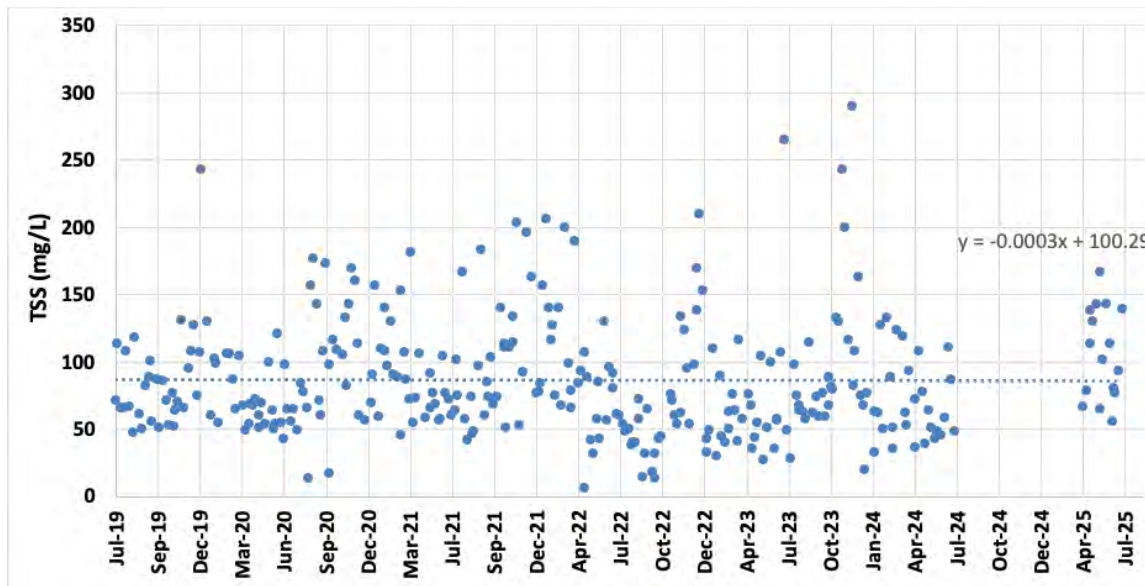


Figure 3-2. Average TSS results at the SMS from individual sampling events (July 2019 – June 2025).

As shown in both figures, the TSS sample results varied throughout the reporting periods. The high variability in TSS samples have historically been observed due to the heterogeneous mixture of wastewaters in the Brine Line. Triplicate analysis for each SAWPA TSS sample has been conducted to help correct for the variability.

3.1.2 VSS Analysis

Figure 3-3 shows average VSS values from individual sampling events at the SMS from July 2016 through June 2025. The overall average VSS value for this period was 78 mg/L.

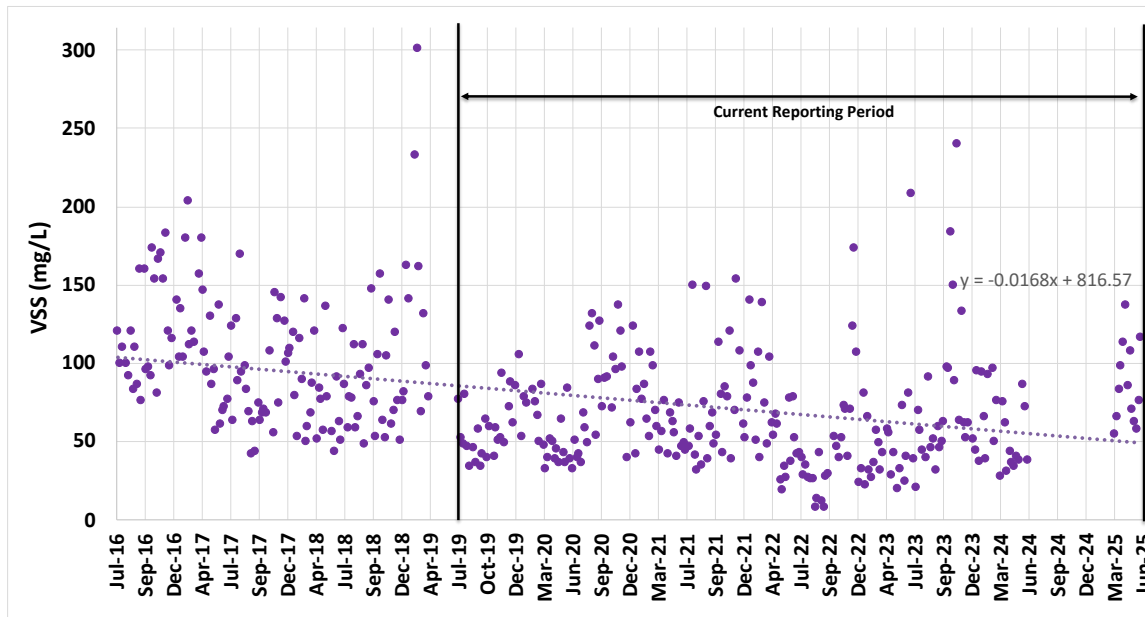


Figure 3-3. Average VSS results at the SMS from individual sampling events (July 2016 – June 2025)

Similar to the TSS trend over time, the VSS values decreased between July 2016 and June 2025, but as shown in Figure 3-4, stabilized during the current reporting period.

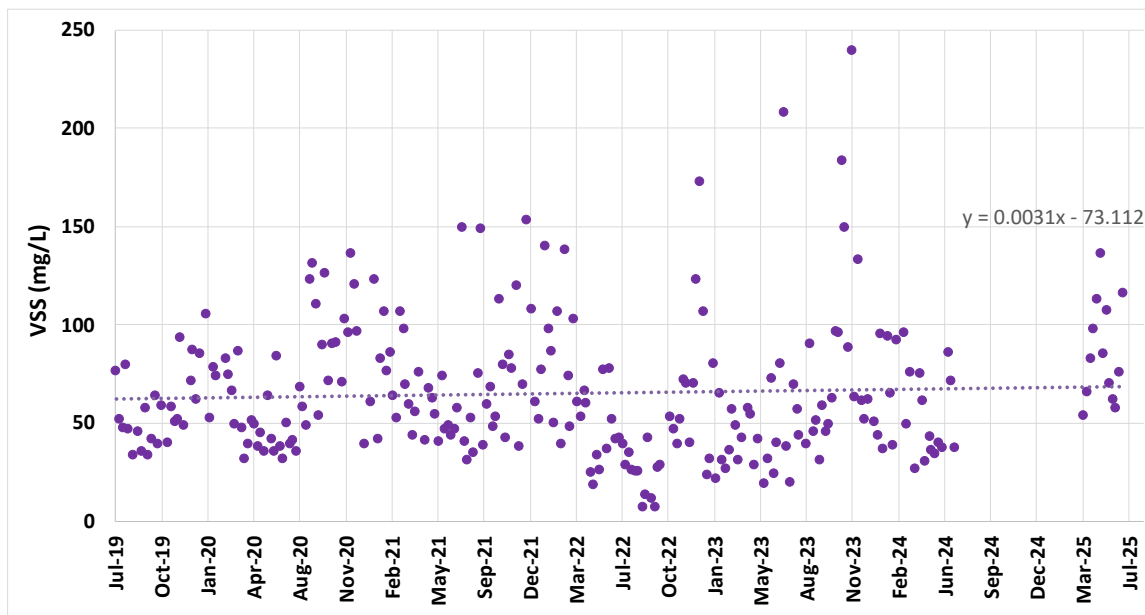


Figure 3-4. Average VSS results at the SMS from individual sampling events (July 2019 – June 2025)



With a flatter and more consistent trendline than the wider timeframe that included historical VSS data, the current reporting period between July 2019 and June 2025 yielded an overall average VSS of 65 mg/L. Similar to the trend observed for TSS, the VSS sample results varied throughout the reporting periods. To help correct for the variability, SAWPA performs analysis in triplicate for each VSS sample.

3.1.3 VSS/TSS Ratio

VSS represent the fraction of TSS of a given sample that volatilizes at 550°C and is used as a surrogate for the organic material. A small portion of non-organics can contribute to VSS, including waters of hydration, ammonia, and mass loss due to mineral transformation. VSS/TSS was calculated for each individual sampling event to represent the organic fraction of suspended solids. Table 3-1 shows the overall average TSS, VSS, and VSS/TSS ratio for each fiscal year within the current reporting period (19/20, 20/21, 21/22, 22/23, and 23/24), as well as the recent sampling period of April to June 2025.

Table 3-1. Average TSS, VSS, and VSS/TSS ratios from SMS

Timeframe	Average TSS ¹ (mg/L)	Average VSS ² (mg/L)	Average VSS/TSS Ratio ³
July 2019 – June 2020	81	57	72%
July 2020 – June 2021	94	75	75%
July 2021 – June 2022	97	70	70%
July 2022 – June 2023	70	49	70%
July 2023 – June 2024	84	69	76%
April 2025 – June 2025	107	87	78%
Period Average:	89	68	73%

¹Includes both SAWPA and OC San TSS data.

²Only includes SAWPA VSS data. OC San does not collect VSS data.

³Average of VSS/TSS of each individual SAWPA sampling event.

The average VSS/TSS ratio for the current reporting period was 73%, which is similar to the average value of 72% for the previous reporting period of April 2018 through December 2018 (Trussell, 2019). Variability in the average VSS/TSS ratio was

observed among the fiscal years, as indicated in Table 3-1. However, the general trend of VSS/TSS ratios for weekly samples since July 2019 has been relatively consistent, as shown in Figure 3-5.

The estimated concentration of organic material present at the SMS was 75 mg/L, determined by multiplying the overall average TSS concentration (103 mg/L) by the average VSS/TSS ratio (73%). This value is slightly less than the organic concentration for the previous reporting period (April 2018 – December 2018) of 78 mg/L (Trussell, 2019).

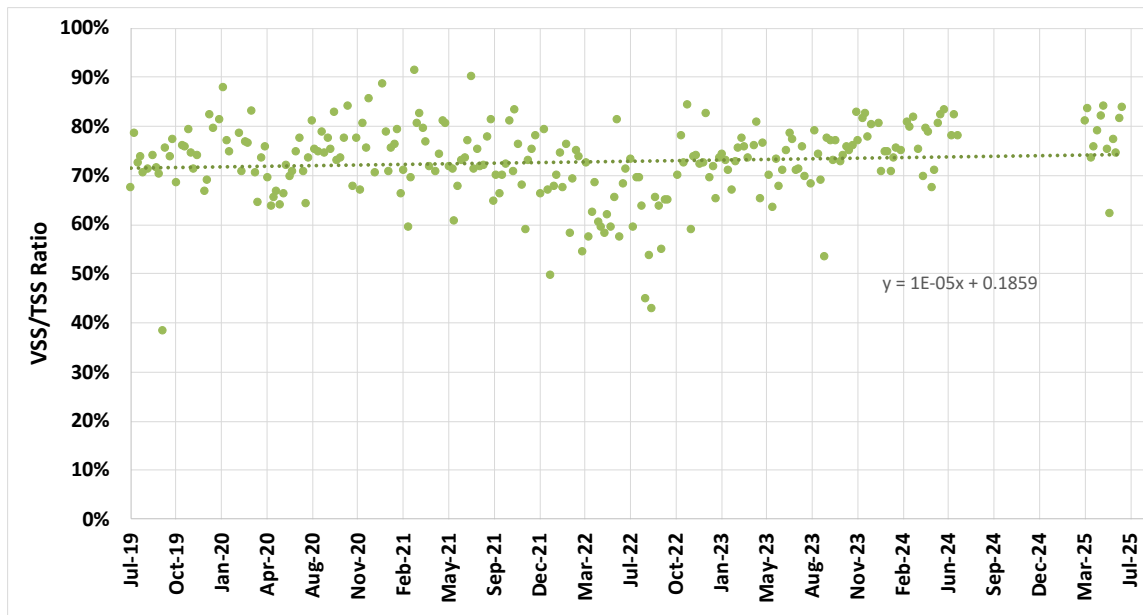


Figure 3-5. VSS/TSS ratio at the SMS from individual sampling events (July 2019 – June 2025)

3.2 Discharger Data Review

Since the 2016 Billing Formula Report (Trussell 2016e), SAWPA has implemented supplemental technical monitoring of solids formation-related parameters that was recommended to collect consistent, targeted data for characterization of the wastewater entering the Brine Line from each discharger. The recommended monitoring frequency for each discharger was determined based on their respective contribution to the solids formation in the previous reporting period. These discharger monitoring frequencies were re-evaluated using data from the current reporting period, which is discussed in Sections 3.2.2 and 6.2.

When data were unavailable for a specific discharger during a given month, data were extrapolated and averaged from surrounding months. While this is a reasonable approximation for months without data, it may not fully capture the variability in loading

values. Additionally, total and dissolved parameters (i.e., calcium, alkalinity, BOD₅) were not always analyzed together from a single sample. This makes it difficult to establish a correlating relationship between total and dissolved measurements to determine a representative measurement of the particulate fraction. Considering the importance of the particulate measurements for understanding the solid fraction of the discharger loading, it is especially important to use correlating total and dissolved measurements for each of the billing parameters.

3.2.1 Changes within the Brine Line System and Dischargers

For the current reporting period (July 2019 – June 2025), data of 55 dischargers were included in the analysis. In comparison, 36 dischargers were analyzed for the previous reporting period (April 2018 – December 2018). Known changes to the Brine Line dischargers compared to the previous reporting period include:

- Six new direct dischargers came online after March 2019, including Rialto Bioenergy Solutions, Aramark, City of Beaumont, SCE Mira Loma Peaker Plant, In-N-Out, and Perris Desalter II.
- Six dischargers ceased discharge before July 2019, including Bonview, JCSD Harrison, JCSD Archibald, JCSD Scholar Way Metering Station, EMWD Railroad Canyon Pipeline, and Inland Bioenergy.
- The previous reporting period only analyzed direct dischargers (i.e., dischargers that pay their disposal fees directly to SAWPA); however, data from both indirect and direct dischargers were analyzed for this current reporting period. The data of 19 indirect dischargers were incorporated into the analysis of this current reporting period.

Five direct dischargers (Del Real, JCSD Wells 17 & 18, Magnolia Foods, Metal Container Corporation, and Roger Teagarden IX) are not within SAWPA's billing jurisdiction and are therefore not included in the current analysis. Their collective contributions are captured through monitoring at JCSD Etiwanda Metering Station.

Currently, the following changes are planned:

- Three dischargers (JCSD Hamner, Dart Container Corp and Decra Roofing) plan to cease their discharge to the Brine Line within the next 6 months.
- JCSD plans to eventually reroute the flows that currently enter the Brine Line at the Hamner and Wineville metering stations, and divert them to WRCRWA instead.

Water quality data were collected both by participating agencies and the dischargers, hereafter referred to as self-monitoring report (SMR) data in this report. Similar to previous reports, all agency and SMR data collected between July 2019 and June 2024 were provided to Trussell and incorporated in the analysis.

In comparison to July 2019 – June 2024, during the recent April – June 2025 sampling period, dischargers performed sampling according to the February 2025 sampling plan (see Appendix B). This provided monitoring results for all individual dischargers that had

correlated water quality results for all parameters from a single sample. As such, the recent sampling period results only reflect the supplemental technical monitoring of dischargers; no SMR data were included, which differs from previous reports.

3.2.2 Discharger Loading Rates

For each discharger, data of each parameter were averaged on a monthly basis, converted to monthly loadings using monthly flow, then averaged over the reporting period. When data for a given parameter were unavailable for a particular month, the average of the two adjacent months were taken as an estimate and included in the calculation of averages. The monthly average loadings of dischargers were summed to determine the total average Brine Line discharger loading rate for each parameter.

Three categories of dischargers – brine, commercial, and domestic – have been established for the purposes of this technical report (unrelated to billing or legal terminologies) with the following definitions:

- **Brine dischargers** discharge high-TDS concentrate flow from water treatment processes.
- **Commercial dischargers** discharge wastewater from commercial operations, such as producing, manufacturing, processing, institutional, or governmental.
- **Domestic dischargers** discharge wastewater from private residences resulting from the use of water for personal washing, sanitary purposes, or discharging of human excrement and related matter.

Dischargers are categorized based on their primary category of flow (i.e., a discharger that discharges a small fraction of domestic flow to the Brine Line, but whose majority of flow is brine, is categorized as a brine discharger). A profile of monthly suspended solids loading to the Brine Line is subdivided between the three categories, as shown in Figure 3-6.

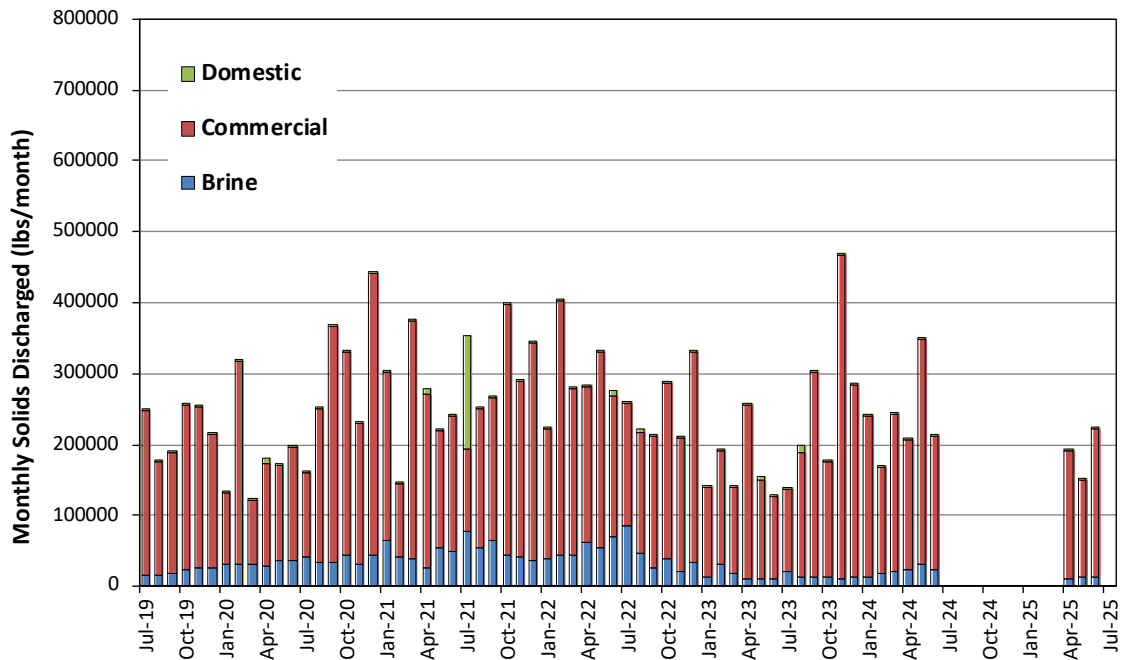


Figure 3-6. Brine Line discharger suspended solids loading by category (July 2019 – June 2025)

From Figure 3-6, commercial dischargers comprised most suspended solids loading. The solids loading by the brine dischargers increased from mid-2019 until reaching a peak in July 2022 and decreasing again. Domestic dischargers comprised the least of the suspended solids loading, which is consistent with SAWPA's efforts to remove primarily domestic flows from the Brine Line. However, there was a spike in domestic discharger output in July 2021, which corresponded to an emergency use of the Brine Line by WRCRWA.

A summary of average discharger loading into the Brine Line for each monitoring parameter is shown in Table 3-2. The table compares the average loading from the recent periods (July 2023-June 2024 and April-June 2025) with those from the preceding reporting period. Appendix C includes pie charts identifying the top dischargers representing at least 75% of the overall loading for each monitoring parameter for the combined period (July 2023-June 2024, plus April-June 2025).

**Table 3-2. Summary of discharger loadings from recent data and comparison with last reporting period**

Parameter	2019 Report*	Recent Fiscal Year	Recent Sampling Period
	April – December 2018	July 2023 – June 2024	April – June 2025
Flow (MG/mo)	314	379	385
TSS (lbs/mo)	202,100	248,600	200,200
VSS (lbs/mo)	170,000	199,500	168,500
BOD ₅ (lbs/mo)	222,700	227,200	214,700
Dissolved BOD ₅ (lbs/mo)	115,000	93,200	80,200
Total Alkalinity (lbs/mo)	2,192,000	3,099,600	2,919,600
Dissolved Alkalinity (lbs/mo)	1,336,600	2,964,900	2,804,200
Total Calcium (lbs/mo)	786,300	2,148,300	2,213,500
Dissolved Calcium (lbs/mo)	754,500	1,957,800	2,075,100

*Trussell, 2019.

Comparing the discharger loadings in July 2023 – June 2024 with the 2019 report values in Table 3-2, the flow to the Brine Line increased by 21%, which would be expected to result in a direct ~21% increase in all loading values if the corresponding concentrations remained stable. The loading values for most water quality parameters increased with increasing flows to the Brine Line, with the exception of dissolved BOD₅ (-19%). Dissolved alkalinity (+122%), total calcium (+173%), and dissolved calcium (+159%) doubled or nearly tripled, whereas TSS (+23%), VSS (+17%), and total alkalinity (+41%) saw smaller gains. Total BOD₅ rose slightly (2%).

In contrast, comparing the recent sampling period with July 2023 – June 2024, the combined discharger flow increased only 2%. Calcium (+3%) and dissolved calcium (+6%) increased, while TSS (-19%), VSS (-16%), total BOD₅ (-5%), dissolved BOD₅ (-14%), alkalinity (-6%), and dissolved alkalinity (-5%) declined slightly to moderately. The combined discharger VSS/TSS was relatively stable, with a ratio of 84% in the 2019 report, 80% in July 2023 – June 2024, and 84% during the recent sampling period.



The dischargers are ranked in Table 3-3 according to the average monthly flow for July 2023 – June 2025 (excluding July 2024 – March 2025). The table also lists the average monthly loading rates for the primary water quality parameters identified as surrogates for suspended solids formation mechanisms (*i.e.*, TSS, VSS, BOD₅, calcium, and alkalinity). For each parameter, dischargers are grouped as follows, as indicated in the legend:

1. Top 3 dischargers.
2. Contributing to 75% of overall dischargers' loading.
3. Contributing to 95% of overall dischargers' loading.
4. Other dischargers.

Three dischargers are located upstream of other dischargers, and their flows are merged into the flow sent to the downstream dischargers, including Chino II East (upstream of JCSD Etiwanda Metering Station), Chino II West (upstream of JCSD Wineville Metering Station), and SCE Mira Loma Peaker Plant (upstream of JCSD Hamner Metering Station). Both the upstream and downstream dischargers are listed separately in Table 3-3 to clarify their contributions to the Brine Line, but the contributions by the upstream dischargers were not factored into the overall loading ranking (*i.e.*, top 3, 75%, and 95%).

Two dischargers – SCE Mira Loma Peaker Plant and JCSD Chandler Lift Station – lack certain water quality data due to infrequent discharge during the current reporting period. Their categories without data are marked with hyphens.

**Table 3-3. Summary of discharger average flow (million gallons per month) and loading rates (kgs/month) from July 2023 through June 2025**

Top 3		75% of loading		95% of loading							
Flow Rank	Discharger Name	Monthly Flow	Total Solids	Volatile Solids	BOD (kg/month)		Alkalinity (kg/month)		Calcium (kg/month)		
		(MG/month)	(kg/month)	(kg/month)	Total	Dissolved	Total	Dissolved	Total	Dissolved	
1	Chino I Desalter	67.1	1278.5	738.7	1276	1230	373362	368920	276965	238068	
2	Perris and Menifee Desalter MP001	67.0	756	605.6	1398	1182	181926	175229	220198	210277	
3	JCSD Etiwanda Metering Station	57.9	62901	55013	43603	9441	157886	151234	69518	63224	
4	Temescal Desalter	53.5	912.8	428.4	824	740	269008	244924	175085	156383	
5	Perris and Menifee Desalter MP002	37.8	480	363	921	802	110375	106291	126653	125769	
6	Chino Desalter II East	33.5	343	215	635	635	75002	71549	56696	52458	
7	WMWD Arlington Desalter	19.4	1166	415	347	270	114937	112152	48378	46980	
8	City of Beaumont Wastewater Treatment Plant	16.3	80	76	642	540	75488	72887	13496	13122	
9	YVWD - Henry Wochholz Plant	13.0	152	144	375	348	13676	13409	9242	8778	
10	Mountainview Generating Station	12.6	1005	329	284	254	7475	5645	9133	7943	
11	JCSD Wineville Metering Station	6.1	9086	4769	3303	400	23031	21686	2141	1877	
12	Aramark Uniform & Career Apparel, LLC	5.0	10833	7832	18540	7443	9766	9456	866	609	
13	California Institution for Women (CIW)	4.7	8116	7615	3694	861	4433	3969	910	823	
14	Mission Linen Supply	4.1	1404	1212	9417	7227	7932	7518	418	332	
15	Chino Desalter II West	3.9	284	90.1	70.9	65.1	21620	20348	1220	1071	
16	Stringfellow Pretreatment Facility	3.5	76.8	70.0	226.5	170.1	2279	2249	3688	3622	
17	In-N-Out Burger, Chino Distribution Center	2.0	564	488	1658	947	3352	3236	801	770	
18	JCSD Hamner Metering Station	1.7	3649	3310	1962	486	2832	2680	386	311	
19	Niagara Bottling, LLC (IEUA)	1.5	259	113	277	95.0	7262	7262	5052	5052	
20	Rialto Bioenergy Solutions	1.3	335	105	934	105.6	4233	4149	755.5	751.4	
21	Californian Institution for Men (CIM)	1.0	42.5	13.0	13.8	6.54	6925	4501	5367	5199	
22	Dart Containers	0.96	70.1	18.0	54.9	18.8	427	399	710	421	
23	Niagara Bottling, LLC (SBMWD)	0.90	574	315	387	299	4432	4432	2252	2234	
24	Repet, Inc.	0.87	3252	2622	7882	5577	3837	3650	211	128	
25	Skorpios Technologies	0.53	168	55.6	40.0	30.2	252	252	1136	109	
26	OLS Energy - Chino	0.46	12.71	9.12	5.34	4.90	400	155	189	171	
27	Wellington Foods	0.37	187	147	2050	1448	678	529	93.3	70.7	
28	Eastside Water Treatment Plant	0.36	34.9	9.5	5.29	3.36	1248	1206	1569	1244	
29	Flavor Specialties	0.13	96.3	75.9	723	557	373	359	24.9	20.9	
30	Inland Water Services	0.12	13.6	4.45	9.91	2.01	49.6	49.6	3224	2793	
31	Green River Golf Course (GRGC)	0.12	158	139	156	18.9	92.9	91.5	35.1	29.2	
32	RCSD	0.10	6.97	1.04	1.81	1.41	987	963	27.0	20.6	
33	WRCRWA - South Regional Pumping Station	0.09	267	267	194	39.3	111	107	20.3	16.4	
34	Saratoga Food, Inc.	0.08	406	369	710	519	428	428	19.6	13.1	
35	Sierra Aluminum Company, Inc.	0.05	0.82	0.59	1.16	0.41	115	115	70.9	46.8	
36	City of Colton - Agua Mensa Power Plant	0.05	1.13	0.60	0.11	0.11	48.9	48.9	20.4	18.5	
37	Emerald Colton	0.049	1.60	0.71	1.13	0.89	27.5	27.5	804	734	
38	Loma Linda University Power Plant	0.031	0.80	0.42	0.55	0.55	14.9	14.9	355	355	
39	SCE Mira Loma Peaker Plant	0.020	0.15	0.15	0.35	0.35	-	-	-	-	
40	Prudential Overall Supply	0.020	1.83	0.67	0.65	0.08	11.9	11.9	180	162	
41	Loma Linda Veterans Affairs (VA) Medical Center	0.012	0.47	0.17	0.30	0.22	5.59	5.59	115	74.5	
42	Decra Roofing Systems	0.010	2.64	2.49	9.69	9.09	12.4	12.4	17.9	12.8	
43	Qualified Mobile, Inc.	0.009	3.38	0.36	0.21	0.21	8.04	8.04	21.4	17.0	
44	Indian Oaks Campground	0.007	0.14	0.08	0.06	0.05	17.6	3.4	71.6	2.83	
45	San Antonio Regional Hospital	0.005	0.45	0.18	1.78	0.08	2.57	2.35	92.8	79.9	
46	La Sierra University	0.002	0.24	0.03	0.03	0.03	0.92	0.84	36.0	29.9	
47	JCSD Chandler Lift Station	0.002	0.60	0.53	0.65	-	-	-	-	-	

As seen in Table 3-3:

- The dischargers that contribute the most flow also generate the most alkalinity and calcium loading. These include Chino I Desalter, Perris and Menifee Desalter MP001, and Temescal Desalter – all three categorized as brine dischargers.
- The top TSS, VSS, and BOD₅ dischargers, including JCSD Wineville Metering Station, Aramark Uniform & Career Apparel, California Institution for Women, and Mission Linen Supply, are commercial dischargers. Despite their significant contributions to these loading categories, none rank in the top 10 of flow contribution.
- JCSD Etiwanda Metering Station, a commercial discharger, ranks third in flow contribution, while also leading in TSS, VSS, and BOD₅ loading, and contributing significantly to alkalinity and calcium loading. This discharge location represents the confluence of several diverse upstream flow types.

3.3 SMS and Discharger Loading Comparison

In this section, the SMS flow and solids loading are compared with those from the dischargers during the current reporting period.

The SMS flow and cumulative discharger flow are compared in Figure 3-7. The flow demonstrates a high degree of uniformity between the SMS and the combined dischargers. While flow from July 2016 through June 2025 was relatively stable, seasonal trends are observed (lower flows in the wintertime). Compared with July 2016 – March 2019 (average monthly flow of 316 MG/month at the SMS), an overall increase in Brine Line flows was observed for the current sampling period (average monthly flow of 353 MG/month at the SMS).

Note that SAWPA adjusts flows of direct dischargers to keep the flow imbalance between SAWPA's SMS flow reading and total discharger flow within 5%. The imbalance is calculated with the equation below. Indirect dischargers are not adjusted by SAWPA and are excluded in the % imbalance equation.

$$\% \text{ imbalance} = \frac{\text{SAWPA SMS Flow Value} - \text{Total Indirect Flows}}{\text{Total Direct Flows} + \text{SAWPA Adjustment}} - 1$$

Figure 3-7 was developed using adjusted direct discharger flow values for the cumulative discharger flow calculation. In addition, the adjusted direct discharger flows were used for the loading calculation discussed in the next section.

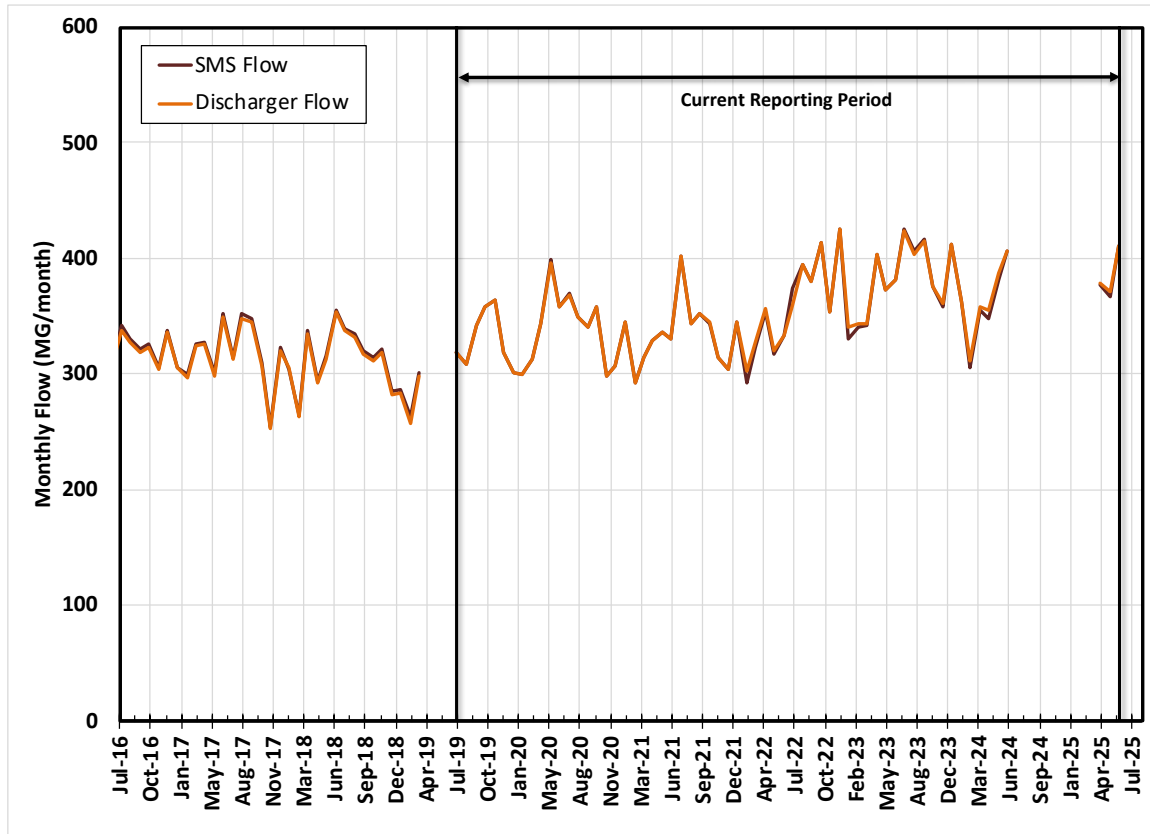


Figure 3-7. Cumulative flow from all dischargers compared with flow measured at SMS from July 2016 – June 2025.

Figure 3-8 shows the comparison of TSS load at the SMS versus the cumulative discharger loading on a monthly basis. TSS loading for an individual discharger is determined by multiplying the average TSS concentration for a particular month by their total measured flow for that month. If TSS concentration data is missing for a month when flow was contributed, it is estimated as the average concentration of surrounding months. Similarly, the SMS TSS load is determined by multiplying the monthly average TSS concentration by the monthly flow measured at the SMS.

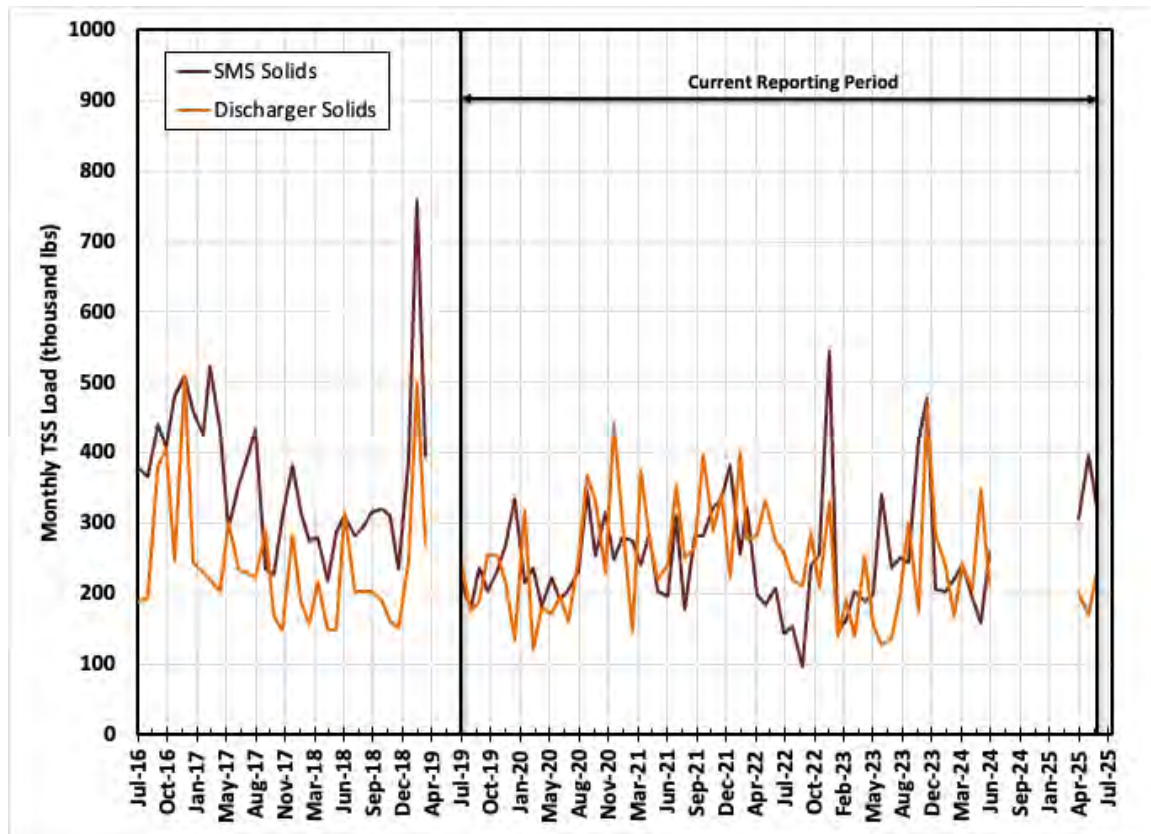


Figure 3-8. Total suspended solids from all dischargers compared with the SMS from July 2016 – June 2025.

Historically, the TSS load observed at the SMS exceeded the TSS load contributed by the combined dischargers. The recent trends between the TSS load observed at the SMS and the combined dischargers have exhibited a greater amount of month-to-month fluctuation since July 2019. Unlike the historical data, in which the SMS TSS load was generally higher than the combined discharger TSS load, the current reporting period from July 2019 to June 2025 yielded more mixed results. The combined discharger TSS load was higher than the SMS TSS load in December 2020, March and October 2021, February 2022, April – September 2022, and May 2024, and the SMS TSS load was higher than the combined discharger TSS load in December 2020, December 2022, June – July 2023 and April – June 2025.

On November 10, 2020, high TSS (6,800 mg/L) and VSS (5,000 mg/L) concentrations were reported at the JCSD Etiwanda Metering Station; upon further investigation by SAWPA, these high concentrations were reported to be linked to a specific production period by the upstream Del Real Foods. Another TSS concentration was reported for the same month that was considered more representative of the typical solids loading for that discharger (380 mg/L). The TSS and VSS results that were sampled at the SMS in November 2020 were typical values and did not seem to be significantly impacted by

the high TSS and VSS discharge monitored at the JCSD Etiwanda Metering Station. For these reasons, the high TSS and VSS values were not incorporated in the data analysis and do not contribute to the discharger loading curve seen in Figure 3-8.

It is insightful to illustrate the difference in suspended solids loading in Figure 3-8 as a ratio, to visualize solids formation in the Brine Line independent of the overall magnitude. Averaged on a fiscal calendar basis, the solids observed at SMS divided by solids input from the dischargers is provided in Figure 3-9. A ratio of 1 means the solids loading observed at SMS equals that of the combined dischargers (*i.e.*, indicating no solids formation) whereas a ratio greater than 1 means that the solids loading at SMS exceeded the suspended solids discharged to the system (*i.e.*, suggesting solids formation). The suspended solids formation ratio in 2015/16 was 1.9 then a decrease in solids formation was observed in 2016/17 that coincided with increased monitoring frequency as part of the billing formula development (early 2016). The resolution of discharger solids loading was improved with increased monitoring, contributing to improved accounting for the solids within the Brine Line. The ratio remained approximately 1.5 for three consecutive years thereafter. Another stepwise change was observed between 2018/19 and 2019/20 (beginning of the current reporting period) after which the ratio remained at or around 1.0 for five fiscal years, suggesting a lack of solids formation. The ratio then increased to 1.3 during the 2024/2025 period, indicating solids formation; however, it is noted that this value only accounts for the recent 3-month supplemental technical monitoring data.

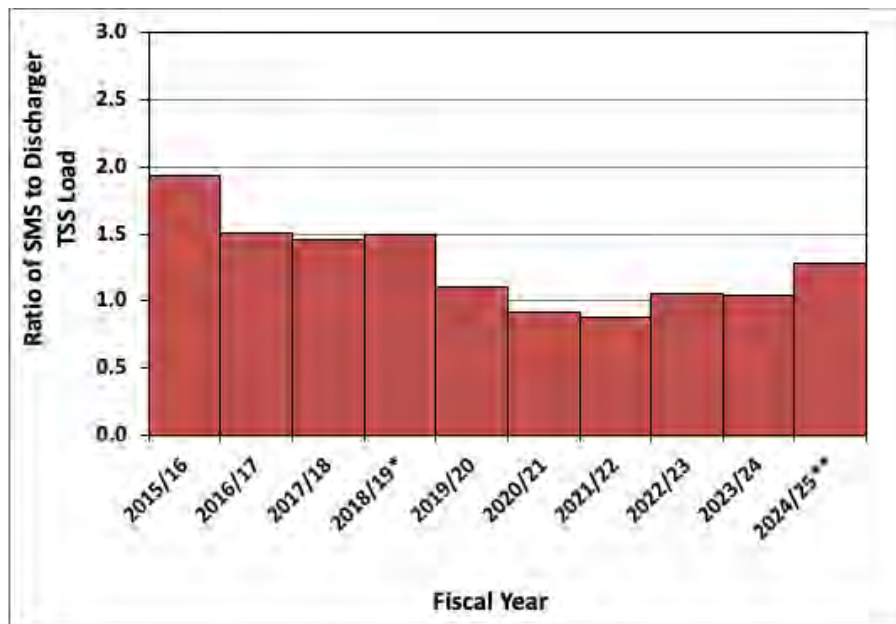


Figure 3-9. Relative increase in TSS in the Brine Line from the points of discharge to the SMS on a calendar year basis (July 2015 through June 2025).

*Based on 9 months (July 2018 – March 2019) of data.

**Based on 3 months (April 2025 – June 2025) of data.

4 Results and Discussion of Recent Sampling Period (April 2025 – June 2025)

4.1 Introduction

This section focuses on the results from the recent sampling campaign that occurred between April and June 2025. The campaign followed the Sampling Test Plan (Appendix B) that was developed to collect supplemental technical monitoring data to the 2019-2024 dataset, as identified by Trussell in the February 2025 communication to SAWPA (Appendix A). During this period, water quality and flow data were collected from dischargers to the Brine Line and the SMS, following new sampling frequencies recommended by Trussell in the Sampling Test Plan that were based on 2019-2024 flow and loading. In addition, solids characterization analyses were conducted at SMS to understand the solids fraction of the flows at the SMS.

Because the solids characterization analyses at SMS were only conducted during this 3-month period, and it is important to compare analogous data to each other, the SMS and discharger solids formation mass balance analysis was limited to the recent sampling period (April to June 2025). These recent sampling period data were used to update the billing formula and reflect ongoing conditions in the Brine Line.

4.2 SMS Assessment

During the recent sampling period, SAWPA continued to collect weekly 24-hour composite samples at the SMS, as was described in Section 3, for triplicate analyses of TSS, VSS, and total BOD₅; along with a single replicate analysis of dissolved BOD₅, total and dissolved alkalinity, as well as total and dissolved calcium. OC San also continued their typical monthly monitoring of TSS and total BOD₅ from composite samples at SMS.

Figure 4-1 shows the TSS results from SMS samples between April and June 2025. The average TSS at the SMS was 107 mg/L.

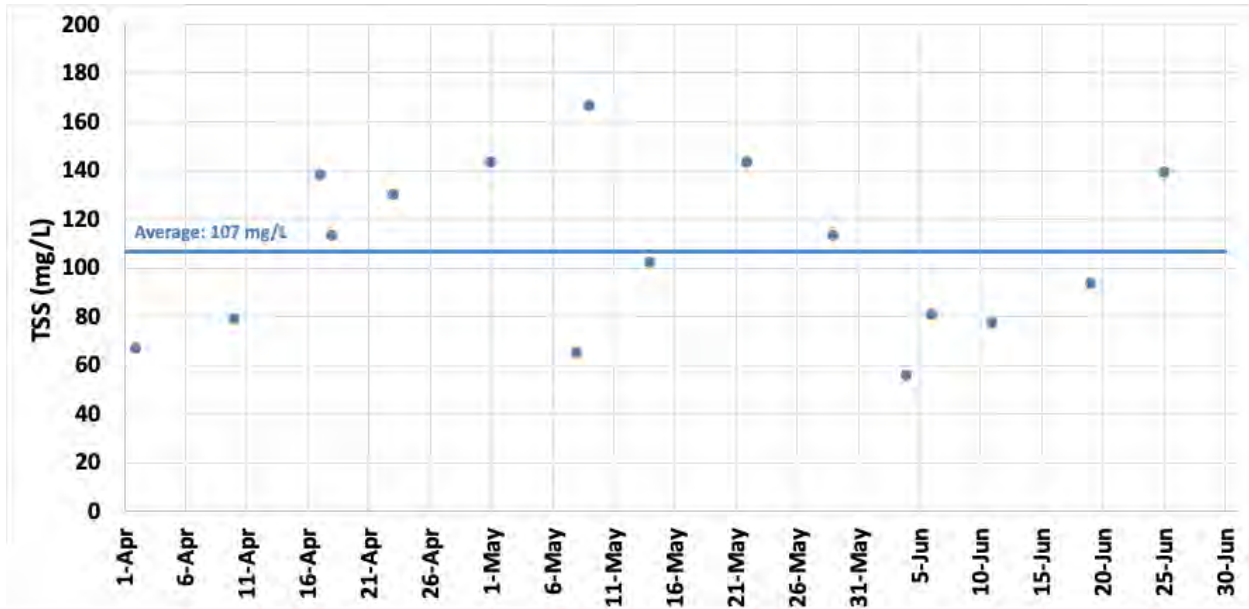


Figure 4-1. Average TSS results at the SMS from individual sampling events (April 2025 – June 2025)

The weekly averaged VSS data from the SMS are shown in Figure 4-2. The average VSS was 87 mg/L.

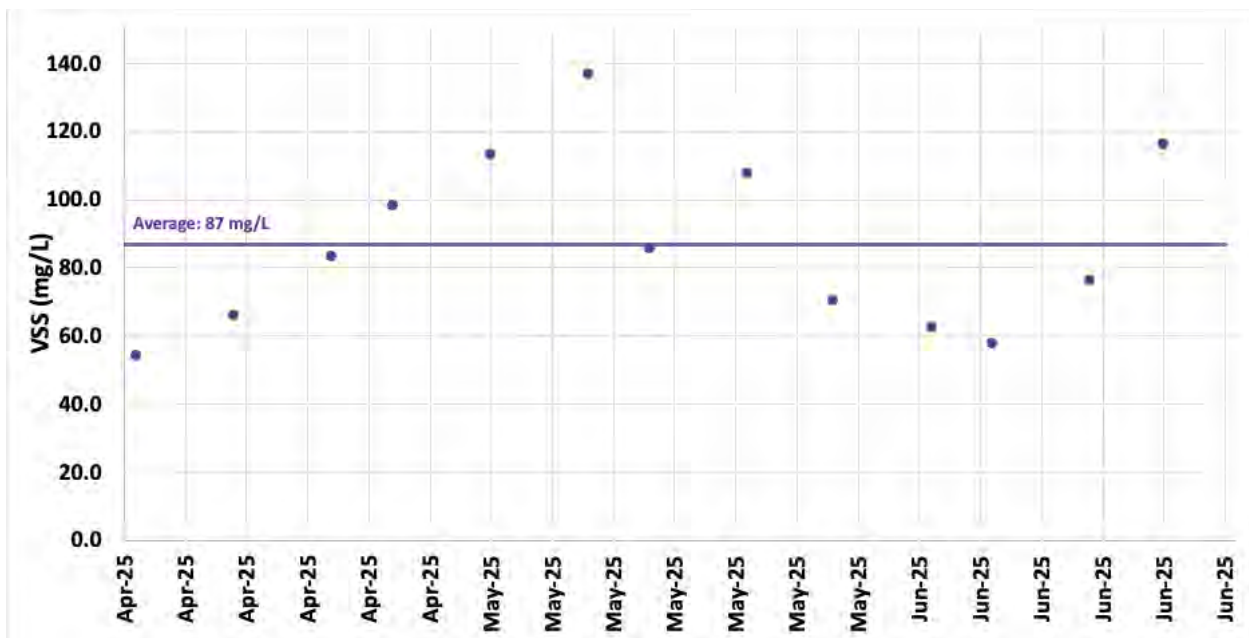


Figure 4-2. Average VSS results at the SMS from individual sampling events (April 2025 – June 2025)

During this same timeframe, solids characterization analyses were conducted by Camet Research on wet solids samples collected on May 1, May 14, and May 29, 2025. To accommodate the extra analyses, a larger volume (approximately 10 liters) was collected for the 24-hour composite sample from SMS on these days. Trussell took a split of the liquid sample and centrifuged it in the Trussell Laboratory to concentrate and separate the suspended solids from the liquid supernatant. The wet solids were then shipped to Camet to perform the following analyses: x-ray diffraction (XRD), wavelength dispersive x-ray fluorescence spectroscopy (WDXRF), and thermogravimetric analysis (TGA). The inorganic fraction of the solids can be understood from the XRD and WDXRF results, while TGA provides an assessment of the organics present in the solids. XRD results are semi-quantitative in nature but are used to identify the presence of different minerals. WDXRF is used to assess the elemental composition of the solids, which can then be used to quantify the minerals present. TGA evaluates the change in mass of the sample with temperature as it is heated to 950°C, which is used to partition the organic fraction of the solids into cellulosic material (*e.g.*, paper and cloth fiber) and microbial biomass by evaluating the mass loss for the temperature ranges where these materials burn.

Using these testing methods on each of the three wet solids samples, Camet identified the relative composition of the solids based on the following categories:

- Calcium minerals – calcite and amorphous calcium phosphate (ACP)
- Cellulose
- Volatiles (organic matter and bound water) – this represents the microbial biomass
- Other inorganic constituents, such as silicon dioxide (SiO_2), iron (III) oxide (Fe_2O_3), sulfur trioxide (SO_3), and aluminum oxide (Al_2O_3)

The reports from Camet Research with results for the three solids characterization events can be found in Appendix D.

These solids composition categories were consistent with prior analyses of the Brine Line solids present at SMS. As with prior characterization events, the dominant minerals present were identified as ACP ($\text{Ca}_9(\text{PO}_4)_6$) and calcite (calcium carbonate, CaCO_3).

The understanding of the organic fraction of the solids present at SMS established by Camet (cellulose + volatiles) was then compared to the corresponding results produced by Babcock (see Appendix E) with the VSS-to-TSS ratio (VSS/TSS) from the same samples (May 1, 14, and 29). The Camet and Babcock VSS/TSS ratios were then averaged between the two datasets to establish the organic composition of the three sample dates, as seen in Table 4-1.

Table 4-1. Average VSS/TSS ratios of Babcock, Camet, and combined Babcock and Camet on the three solids characterization sample dates

Date	Babcock Average VSS/TSS	Camet Average VSS/TSS	Combined Average VSS/TSS
5/2/25	79%	76%	77%
5/15/25	79%	77%	78%
5/30/25	62%	76%	69%

Subsequently, the combined average VSS/TSS ratio of each sample day (Table 4-1) were used in conjunction with the identified solids composition breakdown of each sample day from the Camet analyses to generate three new characterizations of the solids composition of the SMS, including microbial biomass, cellulosic material, calcium minerals, and other inorganics. These three new characterizations can be found in Figure 4-3.

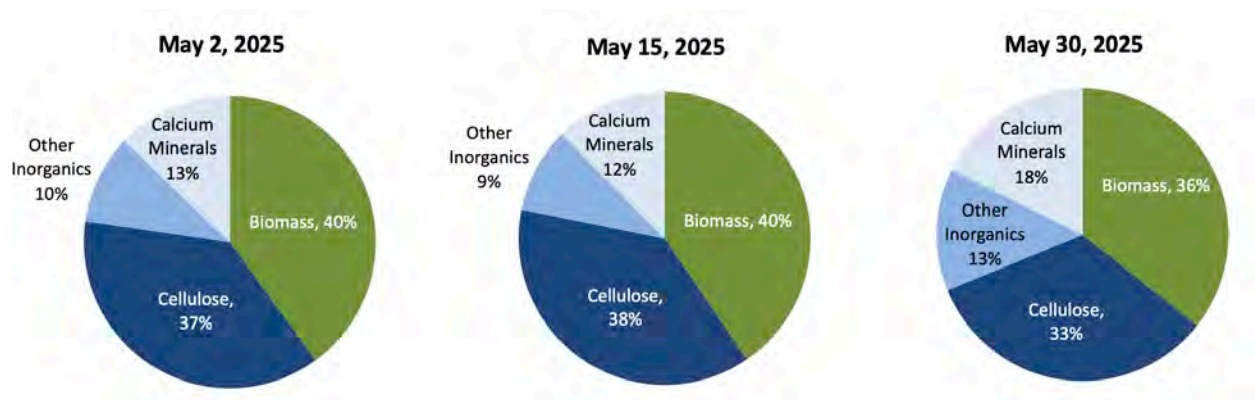


Figure 4-3. Three SMS solids characterizations performed in May 2025, using average VSS/TSS ratios determined from Camet and Babcock analyses

As seen in the figure, the three sampling events yielded proportionally similar compositions, particularly for the samples on May 2 and 15. The May 30 sample contained a higher proportion of inorganics than the prior two samples (31%, compared to 21-23%). In all three samples, the organic fraction (VSS) dominated, accounting for 69-78% of the total solids. Within the organic fraction, the proportions of biomass and cellulose were similar, but the biomass was slightly more in each sample. The inorganics were similarly evenly divided between calcium minerals and other inorganics; however, the proportion of calcium minerals were always greater.



The fractions from the three solids characterizations, expressed as a percent of the TSS at the SMS, were averaged to a single breakdown and multiplied by the average TSS from the liquid fraction of weekly composite samples for the recent period (April-June 2025) to obtain the breakdown by concentration (mg/L) shown in Table 4-2. The components were also expressed as a loading in pounds per month (lbs/month) by multiplying the concentrations by the average monthly flow rate measured at SMS from April through June 2025 (385 million gallons per month), as shown in Figure 4-4.

Table 4-2. SMS solids composition based on solids characterizations (April – June 2025)

SMS Results		
Component	%	Concentration (mg/L)
Microbial Biomass	39%	41.3
Cellulosic Material	36%	38.5
Calcium Minerals	14%	15.3
Other Inorganics	11%	11.7
Total	100%	106.7

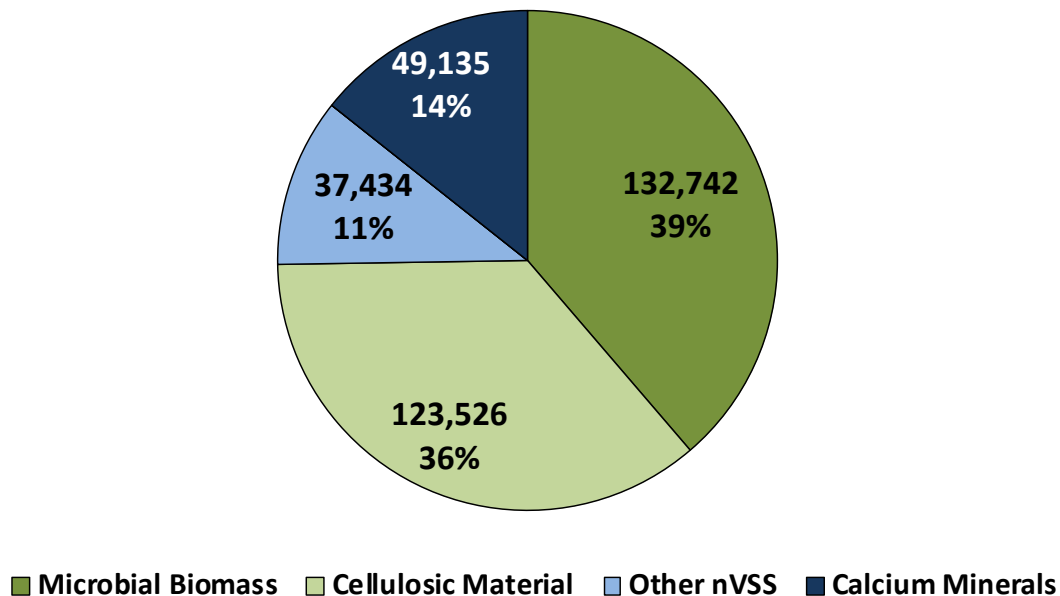


Figure 4-4. Overall composition of the Brine Line suspended solids at the SMS for April – June 2025 (loading represented as lbs/month)

The overall composition of suspended solids at SMS for the current reporting period (Figure 4-4) was compared to historical results since August 2016, as shown in Figure 4-5.

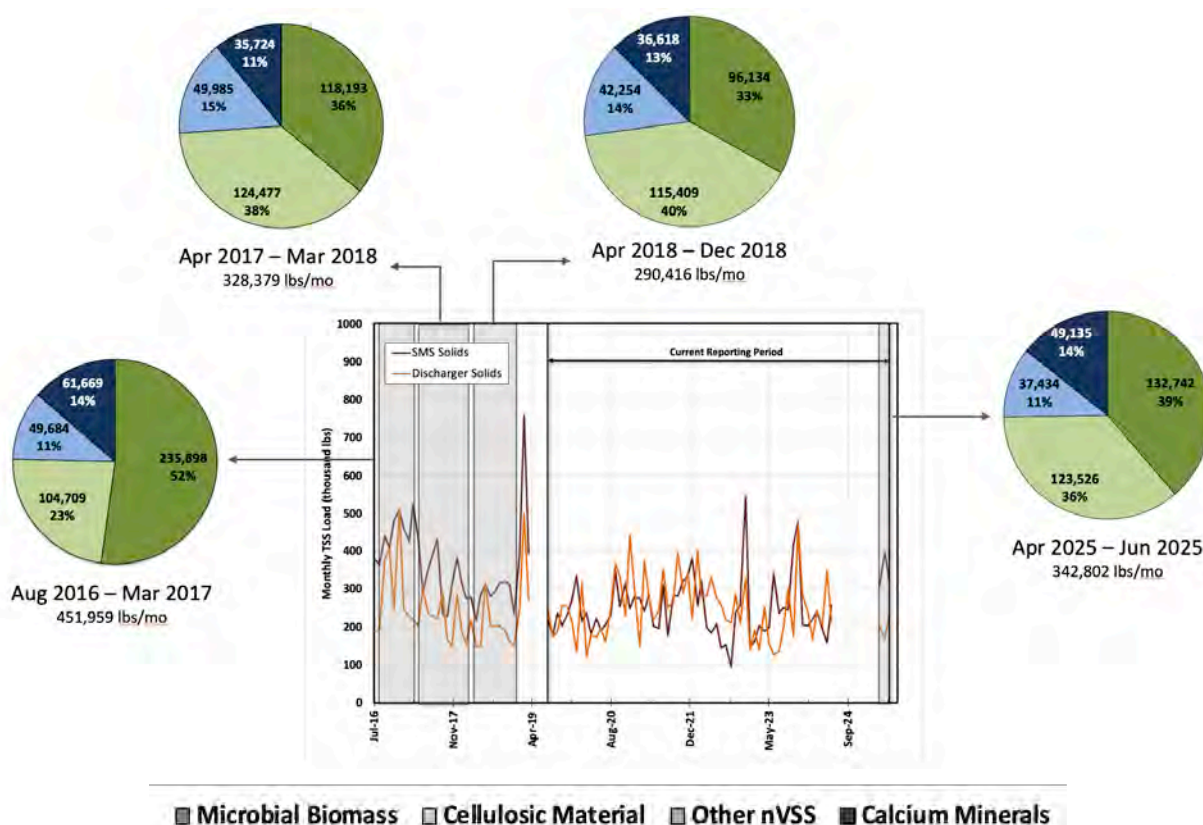


Figure 4-5. Suspended solids characterizations from samples collected at the SMS 2016 – 2025 (loading values in lbs/month)

As seen in the figure, the solids composition has remained consistent on a proportional basis across the different sampling periods, despite the relatively long gap in characterization analyses between December 2018 and April 2025. The solids from the recent sampling period were comprised of 75% organics (VSS, including microbial biomass and cellulosic material) and 25% inorganics (nVSS, including calcium minerals and “other” nVSS). This partitioning has been very stable across all four sampling periods shown in the figure, with the VSS accounting for 73-75%.

Within the organic fraction, the proportion of microbial biomass and cellulosic material has shifted over time. In August 2016 – March 2017, the microbial biomass encompassed the majority of the organic fraction while the cellulosic material encompassed the minority of the organic fraction. During the next two sampling periods (April 2017 – March 2018 and April – December 2018), the cellulosic material encompassed the majority of the organic fraction instead; however, the split was much more even. Then, from April – June 2025, the microbial biomass again encompassed a larger proportion of the organic fraction, albeit at a smaller relative fraction than from



August 2016 – March 2017. In terms of loading, cellulosic material increased from 115,000 lbs/month for the 2018 analysis to 123,000 lbs/month discharged for the recent analysis. The microbial biomass loading increased from 96,000 lbs/month in 2018 to 133,000 lbs/month for the recent period.

Within the inorganic fraction, the proportion of calcium minerals and “other” nVSS has also shifted over time. In August 2016 – March 2017, the calcium minerals encompassed the majority of the inorganic fraction while the “other” nVSS encompassed the minority of the inorganic fraction. During the next two sampling periods, the “other” nVSS surpassed the calcium minerals as the majority of the inorganic fraction. Then, from April – June 2025, the calcium minerals once again dominated as the larger proportion of the inorganic fraction. In terms of loading, “other” nVSS decreased from 42,000 lbs/month in 2018 to 37,000 lbs/month for the recent analysis. Conversely, calcium minerals increased from 37,000 lbs/month in 2018 to 49,000 lbs/month for the recent period.

It should be noted that the magnitude of solids loading at the SMS has varied over time. As indicated in Figure 4-5, the solids loading was elevated in the 2017 analysis (452,000 lbs/month), then dropped over the subsequent two periods, but have recently increased to approximately 343,000 lbs/month. Compared to 2018, the recent reporting period saw an increase in combined inorganic material and combined organic material of 8,000 lbs/month and 46,000 lbs/month, respectively.

4.3 Mass Balance Calculations

A mass balance of the suspended solids characterization between the discharger loading and the SMS is used to calculate the suspended solids formed through the Brine Line system. A summary of the full suspended solids mass balance is provided in Table 4-3.

Table 4-3. Brine Line system suspended solids composition based on mass balance (April 2025 – June 2025)

Component	SMS Results	Combined Discharger Results	Estimated Formed Solids
	Concentration	Concentration	Concentration
	mg/L	mg/L	mg/L
Microbial Biomass	41.3	14.0	27.4
Cellulosic Material	38.5	38.5	0.0
Calcium Minerals	15.3	6.4	8.9
Other Inorganics	11.7	3.5	8.2
Total	106.7	62.3	44.4

To find the combined discharger suspended solids composition for the April – June 2025 period, the combined discharger TSS loading was first partitioned into the organic (VSS) and inorganic (nVSS) fractions using the VSS/TSS ratio determined from the average discharger VSS and TSS loading during the period. Cellulose measured at the SMS was assumed to be consistent with combined discharged loads (not formed or accumulated). The remaining VSS is thus attributed to microbial biomass. Then, the remaining ~25% inorganic fraction of the combined discharger suspended solids composition was partitioned into calcium minerals and “other” nVSS. The particulate calcium loading of the dischargers determined during the period was converted to calcium minerals. During the SMS solids characterization, it was found that ACP and calcite are the dominant calcium minerals found in the calcium loading in the Brine Line. Using an element-to-mineral ratio of 0.4 (i.e., the molecular weight of calcium is about 0.4 in the total mineral molecular weights of ACP and calcite), the calcium mineral proportion was then determined for the inorganic fraction of the combined discharger suspended solids loading. The remaining suspended solids loading from the combined dischargers was attributed to “other” nVSS.

Once the SMS loading and combined discharger loading were determined, the suspended solids formation through the Brine Line was estimated as the difference between the loading measured at the SMS and the combined loading from all dischargers. Microbial biomass makes up a majority of the formed solids and can be attributed to biological growth. Calcium minerals and “other” nVSS encompass the remainder of formed solids through the Brine Line at almost equivalent amounts of growth.

Figure 4-6 consists of three pie charts representing the water quality characterization of the suspended solids loading at the SMS, of the cumulative dischargers and of the estimated formed suspended solids within the Brine Line.

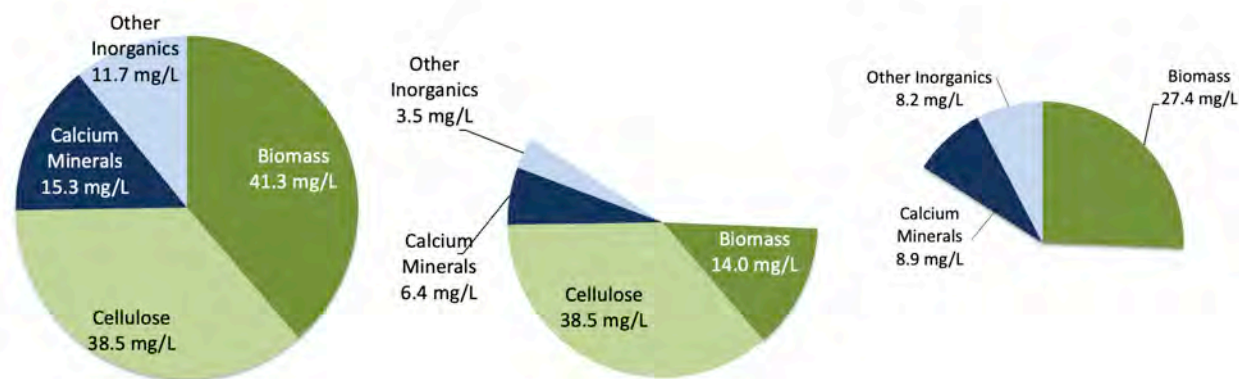


Figure 4-6. Characterization of solids at SMS, of cumulative dischargers, and formation in Brine Line for April – June 2025

Other inorganics make up 18% of the formed suspended solids. Camet Research provided a list of these inorganic constituents and the estimated fraction they contribute



to the solids. The following four constituents, listed in order of their prevalence, comprise the majority of these remaining inorganics in the Brine Line solids:

- SiO_2 – also known as silica, this compound is the most common constituent in sand.
- Fe_2O_3 – also known as ferric oxide or rust.
- Sulfur trioxide (SO_3) – this compound is a byproduct of gypsum in cement and concrete.
- Aluminum oxide (Al_2O_3) – also known as alumina, this compound is found in corundum, which is used to line pipes to prevent abrasion and corrosion. Ceramic lined steel pipes typically contain an alumina ceramic layer.

It is expected that these four constituents are present in the Brine Line flow at the SMS based on wear and tear to the materials that make up the Brine Line collection system (e.g., iron-based pipes, ceramic lined steel pipes, etc.).

5 Billing Formula

Characterization of the total suspended solids formed in the Brine Line system are shown below in Table 5-1, Figure 5-1, and Figure 5-2 during the following reporting periods:

- 1) April – December 2018: values established in 2019 Billing Formula Report (Trussell, 2019)
- 2) April – June 2025: values established for the current reporting period, as discussed in Section 1

Figure 5-1 includes overall compositions of the formed suspended solids in the Brine Line from April – December 2018 and from April – June 2025. The pie chart for the recent sampling period includes the formed suspended solids composition that was shown in Figure 4-6.

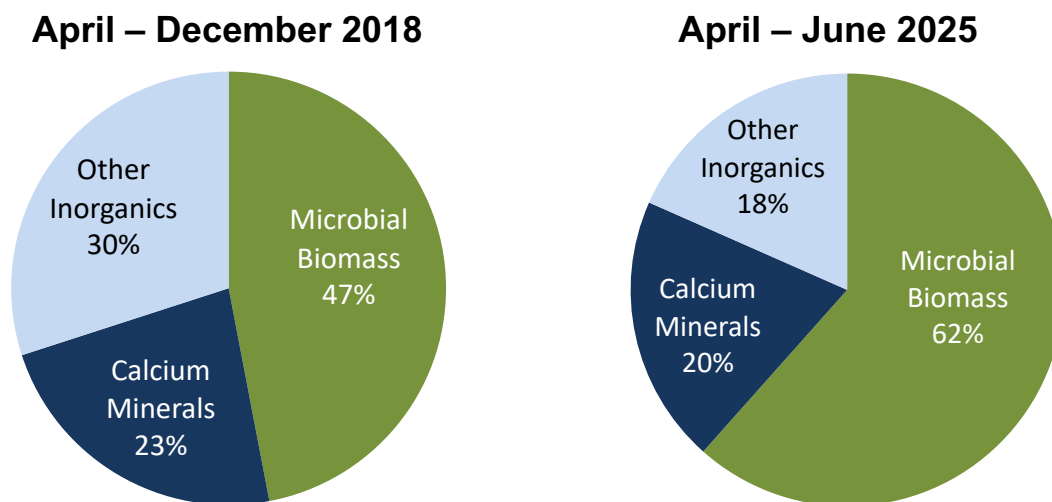


Figure 5-1. Overall composition of formed suspended solids for April – December 2018 and April – June 2025 estimates

5.1 Billing Formula Surrogates

Consistent with the previously established methodology, surrogates were determined to represent the different components of the formed suspended solids. Once established, these surrogates were used to build the billing formula.

- When calcium minerals are found to be formed through the Brine Line system, as they were in the current reporting period, two surrogates are used to allocate the contributing factors in the discharges that lead to precipitation of calcium

carbonate and ACPs: 40% to dissolved calcium and 60% to dissolved alkalinity. The calcium minerals are allocated between the dissolved calcium and components of the dissolved alkalinity (carbonates and phosphates) contributing to the precipitation reactions.

- Dissolved BOD₅ measured from each discharger is used as a surrogate for microbial biomass formation (biological growth).
- A flow-based “service charge” parameter is used to apportion formed solids composed of non-calcium inorganics. As was discussed in a previous section, these “other inorganic” solids are expected to be present at the SMS due to wear and tear on the Brine Line collection system. As such, each discharger contributes to the formation or release of these “other” inorganics in proportion to their flow. Hence, a surrogate of flow is assigned for the “other inorganics”.

Each solids component is shown with its respective formation surrogate in Table 5-1, along with the formed suspended solids breakdown for April – December 2018 and April – June 2025. The overall composition of the solids formed in the Brine Line is presented again in Figure 5-2 using these monitoring surrogates. The use of these surrogates for billing is discussed in Section 5.2.

Table 5-1. Composition of solids formed in the Brine Line for April – December 2018 and April – June 2025

Component	Percent of Formed Solids		Cost Allocation Parameter
	April 2018 - December 2018	April 2025 - June 2025	
Microbial Biomass	47%	62%	Dissolved BOD ₅
Calcium Minerals	23%	20%	Dissolved calcium (40%)
			Dissolved alkalinity (60%)
Other Inorganics	30%	18%	Flow-based service charge
Total	100%	100%	

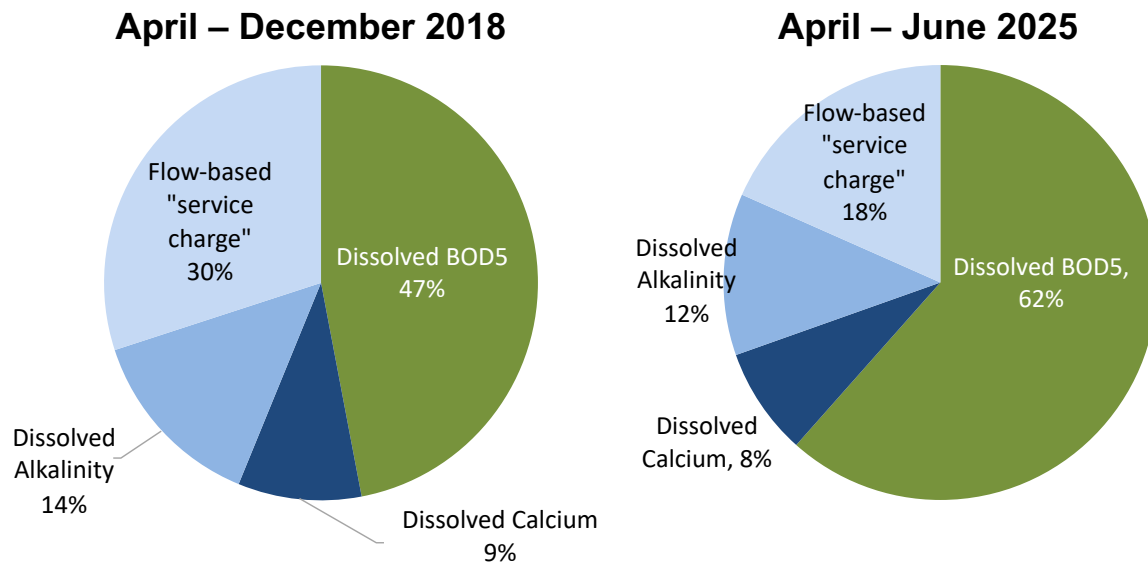


Figure 5-2. Overall composition of formed suspended solids for April – December 2018 and April – June 2025 estimates, by monitoring surrogate

5.2 Brine Line Billing Formula

A billing formula was previously established to equitably allocate the costs SAWPA incurs for OC San to treat and dispose of the solids formed or accumulated within the Brine Line system to the dischargers. The costs associated with the formed solids are allocated based on the formation mechanisms described in the prior subsection and identified in Figure 5-2 to determine the individual contribution of each discharger to the formed solids. The corresponding monitoring surrogates are used as the cost allocation parameters (Section 5.2). The formation factor (FF_i) defines the charge assigned to an individual discharger (i), based on their contributions to the overall loading of the identified surrogate parameters (e.g., dissolved BOD₅, dissolved calcium, dissolved alkalinity, and flow), discussed in the following section.

The billing formula from the 2019 assessment (Trussell, 2019) is provided for comparison. The proposed billing formula for the current reporting period is shown below as the 2025 Billing Formula.

2019 Billing Formula (April – December 2018)

$$FF_{TSS} = \left[\frac{Calcium_m}{Calcium_t} \times (0.094) + \frac{Alkalinity_m}{Alkalinity_t} \times (0.140) + \frac{dBOD_m}{dBOD_t} \times (0.471) + \frac{Flow_m}{Flow_t} \times (0.295) \right]$$



2025 Billing Formula (April – June 2025)

$$FF_{TSS} = \left[\frac{Calcium_m}{Calcium_t} \times (0.08) + \frac{Alkalinity_m}{Alkalinity_t} \times (0.12) + \frac{dBOD_m}{dBOD_t} \times (0.62) + \frac{Flow_m}{Flow_t} \times (0.18) \right]$$

Where:

FF_{TSS} = Formation factor for discharger's estimated share of the TSS formation load

$Calcium_m$ = The dissolved calcium load measured for the discharger

$Calcium_t$ = The sum of the dissolved calcium loads measured for all dischargers

$Alkalinity_m$ = The dissolved alkalinity load measured for the discharger

$Alkalinity_t$ = The sum of the dissolved alkalinity loads measured for all dischargers

$dBOD_m$ = The dissolved BOD₅ load measured for the discharger

$dBOD_t$ = The sum of the dissolved BOD₅ loads measured for all dischargers

$Flow_m$ = The individual flow contribution for the discharger

$Flow_t$ = The combined flow for all dischargers to the Brine Line



6 Monitoring Program

Consistent monitoring of the water quality at SMS and at each discharger, as well as periodic evaluation of the SMS solids characterization, are recommended for maintaining data that reflects real-time changes in the Brine Line system. The monitoring program has been updated to reflect the findings from the recent evaluation.

6.1 SMS Solids Characterization Sampling

The 2019 Annual Water Quality and Billing Formula Report recommended that SAWPA perform monthly solids characterization sampling at the SMS (Trussell, 2019). SAWPA currently does not perform regular solids characterization. After performing the analysis for this current reporting period and comparing the results to previous reporting periods, Trussell has concluded that the solids fraction breakdown between the different organic and inorganic categories has remained consistent over the last several reporting periods. As such, Trussell recommends completing future characterization events every two years with monthly assessment for a three-month period. Figure 6-1 shows an example of the monitoring schedule, and the actual sample timing is flexible.

# of Events	2026											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Weekly WQ Monitoring	4x	4x	4x	4x	4x	4x	4x	4x	4x	4x	4x	4x
Solids Characterization				1x	1x	1x						
# of Events	2027											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Weekly WQ Monitoring	4x	4x	4x	4x	4x	4x	4x	4x	4x	4x	4x	4x
Solids Characterization												
# of Events	2028											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Weekly WQ Monitoring	4x	4x	4x	4x	4x	4x	4x	4x	4x	4x	4x	4x
Solids Characterization								1x	1x	1x		

Figure 6-1. Example Schedule of SMS Weekly Monitoring Events and Solids Characterization Events

The three monthly sampling events are recommended to account for the inherent variability in this heterogenous and dynamic Brine Line system. The full scope of the monitoring plan at SMS is outlined in Table 6-1.

**Table 6-1. Summary of monitoring plan at SMS**

Constituent/Analysis	Test Method	Frequency	Notes
Field Measurements			
Flow	-	Online monitoring	Total per 24-hour sampling event
pH	-	Online monitoring, grab sample	Every sampling event
Temperature	-	Grab sample	Every sampling event
Liquid Analyses			
TSS	SM 2540D	Weekly	Expedited analysis (<24h hold); Analysis in triplicate
VSS	EPA 160.4	Weekly	Expedited analysis (<24h hold); Analysis in triplicate
BOD ₅	SM 5210B	Weekly	Total and dissolved (TSS filter ¹); Total analysis in triplicate
Alkalinity	SM 2320B	Weekly	Total and dissolved (TSS filter ¹)
Calcium	EPA 200.7	Weekly	Total and dissolved (TSS filter ¹)
TDS	SM 2540C	During solids characterization event: once per month for 3 months, every 2 years	
Orthophosphate	SM 4500P E	During solids characterization event: once per month for 3 months, every 2 years	Total and dissolved (TSS filter ¹)
Dissolved Organic Carbon (DOC)	SM 5310B	During solids characterization event: once per month for 3 months, every 2 years	Using TSS filter paper substitution ¹
Solids Characterization			
X-ray diffraction (XRD)	XRD	Once per month for 3 months, every 2 years	Provides mineral characterization
Wavelength Dispersive X-ray Fluorescence Spectroscopy (WDXRF)	WDXRF	Once per month for 3 months, every 2 years	Provides elemental characterization
Thermogravimetric analysis (TGA)	TGA	Once per month for 3 months, every 2 years	Provides cellulose identification and quantification

¹All filtered measurements shall be filtered using a 1.5-micron glass fiber filter.

The current method for sample collection at the SMS is as follows. The 24-hour composite sample is mixed on-site, using a mechanical mixer, and then distributed into bottles for subsequent analysis per the monitoring plan defined in Table 6-1. The sample bottles are sent to both Babcock Laboratories and the Trussell lab. Babcock Laboratories performs liquid analyses listed in Table 6-1. Trussell takes the sample and separates the suspended solids from the liquid supernatant using centrifugation and

then ships the resulting wet sludge to Camet Research for XRD, WDXRF, and TGA analyses.

6.2 Discharger Solids Characterization Sampling

In each discharger sampling event, it is recommended to collect a representative sample and complete single replicate analyses of TSS, VSS, total and dissolved BOD₅, total and dissolved alkalinity, and total and dissolved calcium, all from the same sample. When performing filtration for dissolved components, it is recommended to use a 1.5-micron glass fiber filter to be consistent with the definition of suspended solids from the TSS method. It is important to analyze all of the recommended water quality analyses from a single sample to ensure that the results are representative and can be correlated.

Each active discharger was grouped into one of five categories based on the loading values in Table 3-3: 1) the top three dischargers contributing to total loading for a given parameter, 2) dischargers contributing to the top 75% of the total loading for a given parameter, 3) dischargers contributing to the top 95% of the total loading for a given parameter, 4) intermittent dischargers, and 5) all remaining dischargers. A recommended sampling frequency was assigned to all dischargers within each category. The top three dischargers that contribute to total loading for a given parameter were assigned a monthly sampling frequency, at minimum. Dischargers that contribute to the top 75% of the total loading value for each of the billing parameters were assigned a quarterly sampling frequency, at minimum. Dischargers that contribute to the top 95% of the total loading value for each of the billing parameters were assigned a semiannual (twice per year) sampling frequency, at minimum. A few dischargers identified as having intermittent, seasonal, or emergency flow contributions (e.g., WRCRWA, SCE Mira Loma Peaker Plant, and JCSD Chandler Lift Station) are assigned an intermittent monitoring frequency, with the recommendation to collect a sample every time they discharge to the Brine Line. All remaining dischargers are assigned an annual sampling frequency at minimum. The monitoring frequencies are summarized in Table 6-2. Further refinement of these sampling frequency recommendations could be considered by evaluating the future variability in water quality results for these dischargers. If variability is low for a given discharger across all surrogate water quality parameters, it is expected to have less of an impact in evaluating the real-time cumulative solids loading to the Brine Line system.

The dissolved parameters are the priority for billing purposes. However, it is essential to monitor both total and dissolved species (BOD₅, calcium, and alkalinity) from the same representative sample. Total and dissolved species should not be measured from separate samples. This is a crucial aspect that provides representative correlation between total and dissolved species, allowing for calculation of the particulate or solid fraction present in the sample. Generating representative data on the solids present in the discharger samples allow for improved understanding of the inputs into the Brine Line system, which can then be used in combination with the assessment of solids from the SMS to evaluate solids formation within the Brine Line.

**Table 6-2. Recommended ongoing sampling frequency for Brine Line dischargers**

Top 3	M = Monthly
Top 75%	Q = Quarterly
Top 95%	SA = Semiannual
	A = Annual
	I = Intermittent

Flow Rank	Discharger Name	Total Solids	Volatile Solids	BOD (kg/month)		Alkalinity (kg/month)		Calcium (kg/month)	
		(kg/month)	(kg/month)	Total	Dissolved	Total	Dissolved	Total	Dissolved
1	Chino I Desalter	M	M	M	M	M	M	M	M
2	Perris and Menifee Desalter MP001	M	M	M	M	M	M	M	M
3	JCSD Etiwanda Metering Station	M	M	M	M	M	M	M	M
4	Temescal Desalter	M	M	M	M	M	M	M	M
5	Perris and Menifee Desalter MP002	Q	Q	Q	Q	Q	Q	Q	Q
6	Chino Desalter II East	Q	Q	Q	Q	Q	Q	Q	Q
7	WMWD Arlington Desalter	SA	SA	SA	SA	SA	SA	SA	SA
8	City of Beaumont Wastewater Treatment Plant	SA	SA	SA	SA	SA	SA	SA	SA
9	YVWD - Henry Wochholz Plant	SA	SA	SA	SA	SA	SA	SA	SA
10	Mountainview Generating Station	SA	SA	SA	SA	SA	SA	SA	SA
11	JCSD Wineville Metering Station	M	M	M	M	M	M	M	M
12	Aramark Uniform & Career Apparel, LLC	M	M	M	M	M	M	M	M
13	California Institution for Women (CIW)	M	M	M	M	M	M	M	M
14	Mission Linen Supply	M	M	M	M	M	M	M	M
15	Chino Desalter II West	SA	SA	SA	SA	SA	SA	SA	SA
16	Stringfellow Pretreatment Facility	A	A	A	A	A	A	A	A
17	In-N-Out Burger, Chino Distribution Center	SA	SA	SA	SA	SA	SA	SA	SA
18	JCSD Hamner Metering Station*	-	-	-	-	-	-	-	-
19	Niagara Bottling, LLC (IEUA)	A	A	A	A	A	A	A	A
20	Rialto Bioenergy Solutions	SA	SA	SA	SA	SA	SA	SA	SA
21	Californian Institution for Men (CIM)	A	A	A	A	A	A	A	A
22	Dart Containers	A	A	A	A	A	A	A	A
23	Niagara Bottling, LLC (SBMWD)	A	A	A	A	A	A	A	A
24	Repet, Inc.	Q	Q	Q	Q	Q	Q	Q	Q
25	Skorpios Technologies	A	A	A	A	A	A	A	A
26	OLS Energy - Chino	A	A	A	A	A	A	A	A
27	Wellington Foods	SA	SA	SA	SA	SA	SA	SA	SA
28	Eastside Water Treatment Plant	A	A	A	A	A	A	A	A
29	Frutarom USA, Inc.	SA	SA	SA	SA	SA	SA	SA	SA
30	Inland Water Services	A	A	A	A	A	A	A	A
31	Green River Golf Course (GRGC)	A	A	A	A	A	A	A	A
32	RCSD	A	A	A	A	A	A	A	A
33	WRCRWA - South Regional Pumping Station**	I	I	I	I	I	I	I	I
34	Saratoga Food, Inc.	SA	SA	SA	SA	SA	SA	SA	SA
35	Sierra Aluminum Company, Inc.	A	A	A	A	A	A	A	A
36	City of Colton - Agua Mensa Power Plant	A	A	A	A	A	A	A	A
37	Emerald Colton	A	A	A	A	A	A	A	A
38	Loma Linda University Power Plant	A	A	A	A	A	A	A	A
39	SCE Mira Loma Peaker Plant**	I	I	I	I	I	I	I	I
40	Prudential Overall Supply	A	A	A	A	A	A	A	A
41	Loma Linda Veterans Affairs (VA) Medical Center	A	A	A	A	A	A	A	A
42	Decra Roofing Systems	A	A	A	A	A	A	A	A
43	Qualified Mobile, Inc.	A	A	A	A	A	A	A	A
44	Indian Oaks Campground	A	A	A	A	A	A	A	A
45	San Antonio Regional Hospital	A	A	A	A	A	A	A	A
46	La Sierra University	A	A	A	A	A	A	A	A
47	JCSD Chandler Lift Station**	I	I	I	I	I	I	I	I

*Discharger has been taken offline, no sampling frequency recommendation required.

**Intermittent dischargers only need to sample every time they discharge.

7 Findings and Recommendations

Principal findings from this assessment include the following:

SMS

- **Brine Line flow has increased since 2019:** Compared to average monthly flow for the period of July 2016 – March 2019 of 316 MG/month, average monthly flow of the current reporting period has increased to 353 MG/month.
- **Brine Line suspended solids loading has decreased since 2019:** The monthly average suspended solids loading at the Brine Line has overall decreased since the historical period of July 2016 – March 2019. Compared with 286,000 lbs/month in the previous reporting period, solids loading at the SMS decreased to 260,000 lbs/month in 2023/24 fiscal year.
- **The composition of the solids has remained consistent:** The solids partitioning from the last reporting period and the current reporting period were both roughly 75% organic and 25% inorganic material. Of the organic fraction for this reporting period (75% of the TSS), approximately 39% was identified as microbial biomass and the remaining 36% was cellulosic material. On the inorganic side, the fraction of calcium minerals present is approximately 14% of the suspended solids, with “other inorganics” accounting for the remaining 11%.

Dischargers

- **Discharger flow and loading have increased since 2019:** Consistent with the Brine Line flow, the combined discharger flow has increased compared to the previous reporting period, which would result in an increase in all loadings if their concentrations remained unchanged. The combined discharger suspended solids loading has increased and continued to fluctuate month-to-month. The BOD₅ loading has been stable, dissolved BOD₅ loading has decreased, and total/dissolved alkalinity and total/dissolved calcium loading have significantly increased (doubled or nearly tripled).
- **Solids loading varied by discharger type:** Commercial dischargers comprise the majority of the solids loading; brine dischargers solid loading increased between July 2019 and July 2022 and have decreased since then; and domestic dischargers contributed the least to solids loading but experienced a spike in solids loading in July 2021 due to WRCRWA discharge.
- **Water quality monitoring can be improved:** As was mentioned in previous reports, the total and dissolved fractions of each monitoring parameter should both be analyzed from a single sample. This applies to the measurements of BOD₅, calcium, and alkalinity, as well as TSS and VSS. Additionally, the data collection frequency could be increased for some of the dischargers for certain parameters (e.g., dissolved calcium), as some month-to-month loading values of

impactful dischargers needed to be averaged between data points during the current analysis.

Suspended solids formation

- **The suspended solids formation has increased:** The net solids formation through the Brine Line has increased for the current period to 143,000 lbs/month, compared with an average 94,000 lbs/month for the last reporting period (2019). These average solids formation numbers are provided as a point of reference for comparing the changes over time. For billing purposes, SAWPA incorporates a 12-month rolling average of the suspended solids formation.
- **Increase in microbial biomass formation:** There were similar amounts of calcium mineral and other inorganics formation between the current reporting period and the previous reporting period, but there was about 62% microbial biomass formation during the current reporting period as compared with 47% microbial biomass formation during the previous reporting period. When the difference in formation magnitude between the two periods is considered, the current reporting period had nearly double the microbial biomass formation (88,000 lbs/month) as compared with the previous reporting period (44,000 lbs/month).
- **“Other” inorganic formed suspended solids were identified:** Per Camet Research’s reports, the four constituents that contributed to the highest percentage of the “other” inorganic category were silica, ferric oxide, sulfur trioxide, and alumina. These four constituents are byproducts of wear and tear on the Brine Line collection system.

In light of these findings and known changes, the following recommendations are proposed:

- **Adopt a new billing formula:** It is recommended to adopt the proposed billing formula to reflect changes in the Brine Line solids composition observed since the previous reporting period over 5 years ago.

$$FF_{TSS} = \left[\frac{Calcium_m}{Calcium_t} \times (0.08) + \frac{Alkalinity_m}{Alkalinity_t} \times (0.12) + \frac{dBOD_m}{dBOD_t} \times (0.62) + \frac{Flow_m}{Flow_t} \times (0.18) \right]$$

- **Continue to implement monitoring program:** To continue tracking changes in the Brine Line water quality and suspended solids, it is recommended to continue implementing the monitoring program for both the SMS and individual dischargers to the Brine Line with the analyses and monitoring frequency discussed in Section 6. In addition, it is highly recommended to align the water quality analyses within the same representative samples, so that each water quality parameter from each discharger can be closely tracked and form indicative trends over time of the general conditions within the Brine Line.



- **Evaluate variability in the surrogate water quality parameters for top dischargers:** Assessment of the sample-to-sample variability for the surrogate water quality parameters for the top 3 discharger category (those with monthly frequency) is recommended to determine the impact on cumulative discharger loading values with different sampling frequencies.
- **Lower recommended solids characterization frequency at the SMS:** Monthly characterization of suspended solids is not necessary for the SMS because the solids fraction breakdown between the different organic and inorganic categories remains relatively consistent. Trussell recommends the solids characterization events to be performed once per month for three months, every 2 years.

8 References

- Trussell (2011). "Understanding the Suspended Solids in the Inland Empire Brine Line." Workshop presentation to the *Santa Ana Watershed Project Authority*. Dec 20.
- Trussell (2012). "Understanding Control of Suspended Solids Formation in the Inland Empire Brine Line." Workshop presentation to the *Santa Ana Watershed Project Authority*. Jun 12.
- Trussell (2013). "Inland Empire Brine Line Green River Monitoring Station (S-01) Water Quality Monitoring Report: April 2012 through March 2013." Report for the *Santa Ana Watershed Project Authority*. July 18.
- Trussell (2015). "Inland Empire Brine Line Green River Monitoring Station (S-01) Water Quality Monitoring Report: April 2013 through March 2015." Report for the *Santa Ana Watershed Project Authority*. June 9.
- Trussell (2016a) "Evaluation of Variability of TSS and BOD Measurements from the Brine Line." Report for the *Santa Ana Watershed Project Authority*. January 21.
- Trussell (2016b) "Canyon RV Park S-01 Troubleshooting Summary." Report for the *Santa Ana Watershed Project Authority*. February 12.
- Trussell (2016c). "Inland Empire Brine Line – Canyon RV Park S-01 Water Quality Monitoring Report, March 2015 through December 2015." Report for the *Santa Ana Watershed Project Authority*. May 10.
- Trussell (2016d). "Brine Line and Discharger Sampling Test Plan." Report for the *Santa Ana Watershed Project Authority*. May 9.
- Trussell (2016e). "Proposed Solids Formation Recovery Formula for the Inland Empire Brine Line." Report for the *Santa Ana Watershed Project Authority*. October 10.
- Trussell (2017). "Inland Empire Brine Line Water Quality Monitoring & Solids Formation Recovery Formula Report August 2016 through March 2017." Report for the *Santa Ana Watershed Project Authority*. July 21.
- Trussell (2018). "Inland Empire Brine Line Water Quality Monitoring & Solids Formation Recovery Formula Report April 2017 through March 2018." Report for the *Santa Ana Watershed Project Authority*.
- Trussell (2019). "Inland Empire Brine Line Water Quality Monitoring & Solids Formation Recovery Formula Report April 2018 through March 2019." Report for the *Santa Ana Watershed Project Authority*. Sep 5.



9 Appendix A – Trussell Communication with SAWPA, February 2025



COMMUNICATION

Santa Ana Watershed Project Authority

Draft Date: February 4, 2025

Authors: Aidan Hasegawa
Wen Cong, Ph.D.

Reviewers: Emily Owens-Bennett, P.E., BCEE

Subject: Inland Empire Brine Line Water Quality and Solids Formation Update

1 Background

Trussell Technologies, Inc. (Trussell) has been retained by the Santa Ana Watershed Project Authority (SAWPA) to conduct an updated study of the Inland Empire Brine Line (Brine Line) water quality and billing formula (Study). SAWPA owns and operates the Brine Line, which conveys a mixture of brine concentrate, domestic, and industrial wastewaters from its upper reaches in Riverside and San Bernardino Counties to Orange County. Ownership of the wastewater and conveyance is transferred from SAWPA to the Orange County Sanitation District (OC San) at the County Line, specifically at the Canyon RV Park monitoring station. The Study's objectives are twofold, (1) to assess recent water quality and evaluate changes through the Brine Line system and (2) to develop an updated scientifically-based formula for allocating costs associated with any identified solids formation. The first effort of the Study involved summarizing the water quality data of the Brine Line for the period covering July 2019 through June 2024; documenting an updated historical assessment of water quality in the Brine Line; and identifying findings and recommendations for supplemental monitoring to obtain sufficient data for assessing the solids formation and updating the Brine Line billing formula. This information is contained within this Communication and will ultimately be included in a final report on the Study.

The effort builds on Trussell's support of SAWPA since 2011 in characterizing suspended solids formation in the Brine Line. Since 2016, SAWPA has implemented a billing formula developed in collaboration with Trussell to allocate OC San solids treatment and disposal costs to SAWPA's dischargers for solids formed in the Brine Line. Trussell completed annual reviews of the billing formula and monitoring data for the years 2017, 2018, and 2019. It is important to note that the prior efforts to assess and allocate solids formed within the Brine Line system relied on characterization of the solids fraction of samples collected from the County Line monitoring location. This effort was discontinued in late 2021; thus, the data assessment for this current effort is limited to the water quality results (liquid samples) from both the County Line and individual Brine Line dischargers.

2 Methodology of Data Review

This section summarizes the methodology incorporated in the water quality data review, which builds on efforts from Trussell's prior Brine Line solids formation studies. Due to discontinuation of the solids monitoring at the County Line as of late 2021, this assessment does not include solids characterization.

2.1 Overview of Data Received

For the current reporting period (July 2019-June 2024), Trussell received water quality and flow data for sixty (60) direct and indirect Brine Line dischargers, and the downstream Canyon RV Park S-01 (S-01 or County Line) monitoring location. This water quality data was collected in conjunction with routine monitoring previously recommended to complement the solids formation billing formula.

The water quality data that were evaluated for the Study are listed in Table 1 below.

Table 1. Water quality parameters used in analysis.

Parameter	Unit
Total Suspended Solids (TSS)	mg/L
Volatile Suspended Solids (VSS)	mg/L
Biochemical Oxygen Demand (BOD ₅), Total	mg/L
BOD ₅ , Dissolved	mg/L
Alkalinity, Total	mg/L as CaCO ₃
Alkalinity, Dissolved	mg/L as CaCO ₃
Calcium, Total	mg/L
Calcium, Dissolved	mg/L

Although water quality data was provided for each individual discharger during the monitoring period, there were discrepancies between the recommended monitoring frequency and the frequency of data for some dischargers, as well as missing data points for some water quality parameters. For several dischargers, the dissolved parameters were often not analyzed, which is a challenge for evaluating the particulate fraction of the sample for a given parameter (total – dissolved = particulate). Another data challenge was the occurrence of unpaired monitoring results, where the TSS and VSS were analyzed from different samples, making it difficult to establish representative data that can be correlated among parameters, as well as over time for a given discharger location.

2.2 Discharger Data Analysis

The water quality data from the sixty dischargers were averaged by month. Using the water quality parameters shown in Table 1, the following parameters were calculated:

- VSS/TSS ratio (unitless)
- Particulate BOD₅ (mg/L)
- Particulate Alkalinity (mg/L)

- Particulate Calcium (mg/L)

Solids loading values (in kilograms per month) associated with each of the water quality constituents that have historically been used to assess solids formation in the Brine Line were calculated using the product of monthly average flow data (in million gallons per month) and monthly average water quality data (in mg/L).

2.3 County Line Data Analysis

For the County Line, monthly flow data (in million gallons per month) and weekly water quality data (in mg/L) were provided. To calculate the VSS/TSS ratios, the average VSS of a given date was divided by the average TSS of that date. To calculate solids formation values for each of the contributing parameters, the monthly average water quality data from weekly sampling events and monthly average flow data were used.

2.4 Data Adjustments

The previous reporting periods contained some data adjustments, which were documented in past Trussell reports:

- The discharger Inland BioEnergy released an uncharacteristically high suspended solids load from late January into early March 2019, resulting in nonrepresentative suspended solids measurements from both discharger loading and from the County Line results from January to March of 2019 (Trussell, 2019). For this reason, data from January to March of 2019 were omitted in the 2019 report.
- In 2016, the frequency of data monitoring increased as part of the billing formula development (Trussell, 2019).

Key adjustments associated with the analysis of data from the current reporting period include:

- The JCSD Etiwanda Monitoring Station is located on a JCSD lateral, just upstream of the connection to the Brine Line. There are several upstream dischargers to the JCSD Etiwanda lateral, including Chino II East. In past analyses, the monitoring data from JCSD Etiwanda was adjusted to exclude the Chino II East flows and loading values, such that these two discharges could be evaluated separately. For the current reporting period, water quality and flow data were provided for five direct dischargers to the JCSD Etiwanda lateral, including Del Real Foods, JCSD Wells 17 & 18, Metal Container Corporation, JCSD Roger D. Teagarden IX Water Treatment Facility, and Magnolia Foods. The data from these 5 direct dischargers to the JCSD Etiwanda line were evaluated to assess relative solids loading values.
- In November 2020, high TSS (6,800 mg/L) and VSS (5,000 mg/L) concentrations were reported for the JCSD Etiwanda Monitoring Station. SAWPA confirmed that these values correspond with the Del Real Foods tamale production season and should be considered outliers as changes have been made to eliminate these high-solids loading wastewater events. Another TSS concentration was reported for the same month that was considered more representative of the company's typical solids

loading output (380 mg/L). For these reasons, the high value of 6,800 mg/L TSS was eliminated from this analysis.

3 Results

This section provides a summary of the water quality conditions within the Brine Line during the current reporting period. Flow and loading values are evaluated for the cumulative discharger contributions, the downstream County Line monitoring location, and comparison of these to reflect changes through the Brine Line system. After identifying trends, the data from each source were analyzed separately. This analysis also identified discrepancies and/or deficiencies in the monitoring data and associated solids loading assessment. These findings inform recommendations for additional monitoring to be completed in the subsequent phase of the Study.

3.1 Comparisons between County Line and Dischargers

Flow through the Brine Line is an indicator of changes through the system over time. As shown in Figure 1, flow demonstrates a high degree of uniformity between the County Line and the combined dischargers. Statistics of the monthly flow imbalance between the County Line flow and the total discharger flow during the selected historical period (January 2014 – March 2019) and the current reporting period (July 2019 – June 2024) are shown as tables in the figure. The average flow imbalances during the historical and current periods are similar and minimal (1.1% and 1.3%). Conversely, the current reporting period experienced more variation between its County Line flow and combined discharger flow than the historical period; the current period had larger 5th and 95th percentiles (-5.1% and 8.0%, respectively) than the historical period (-0.7% and 5.5%, respectively).

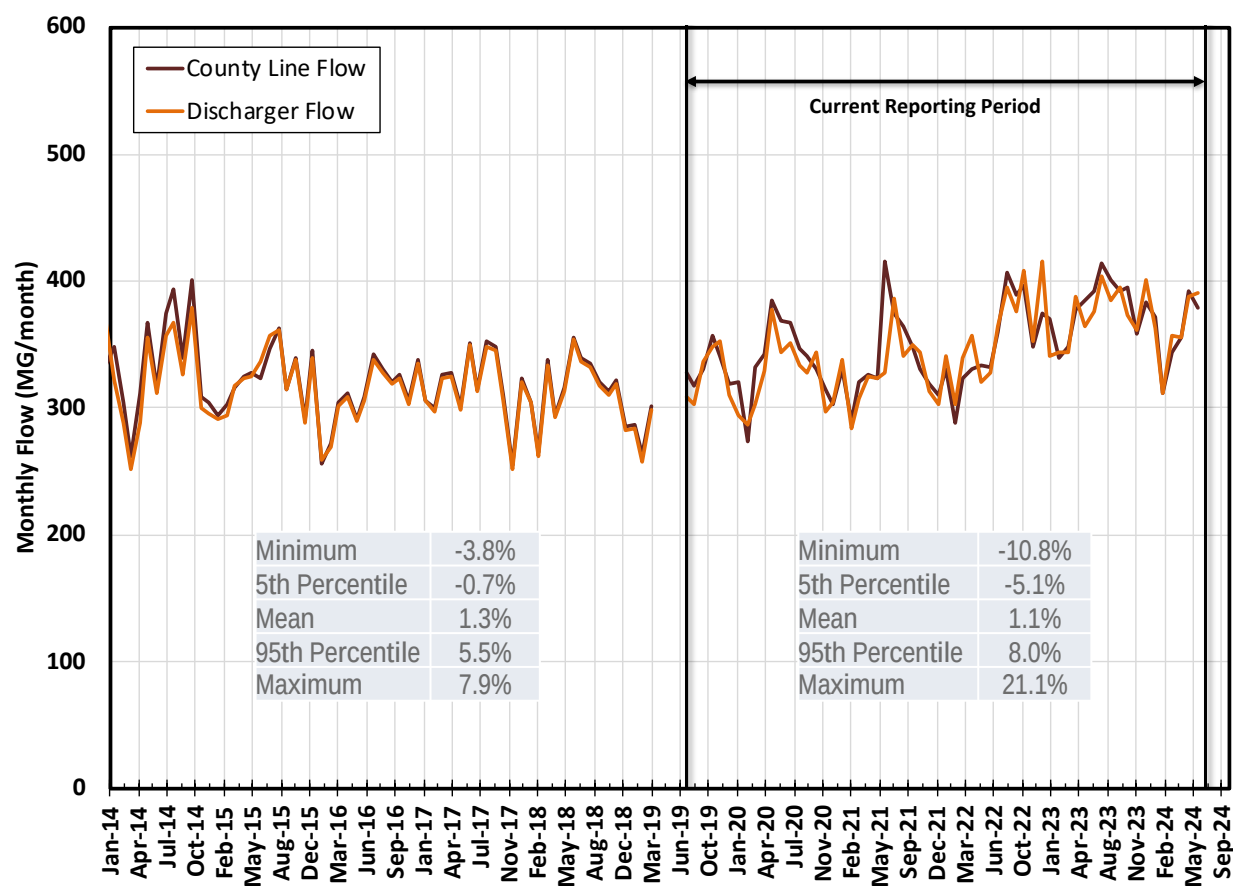


Figure 1. Cumulative flow from all dischargers compared with flow measured at S-01 from March 2014 – June 2024.

Then, the combined monthly TSS loading from all dischargers were graphed against the monthly TSS loads reported at the County Line monitoring location. Figure 2 shows the comparison from January 2016 to June 2024, with historical data through January 2016, as well.

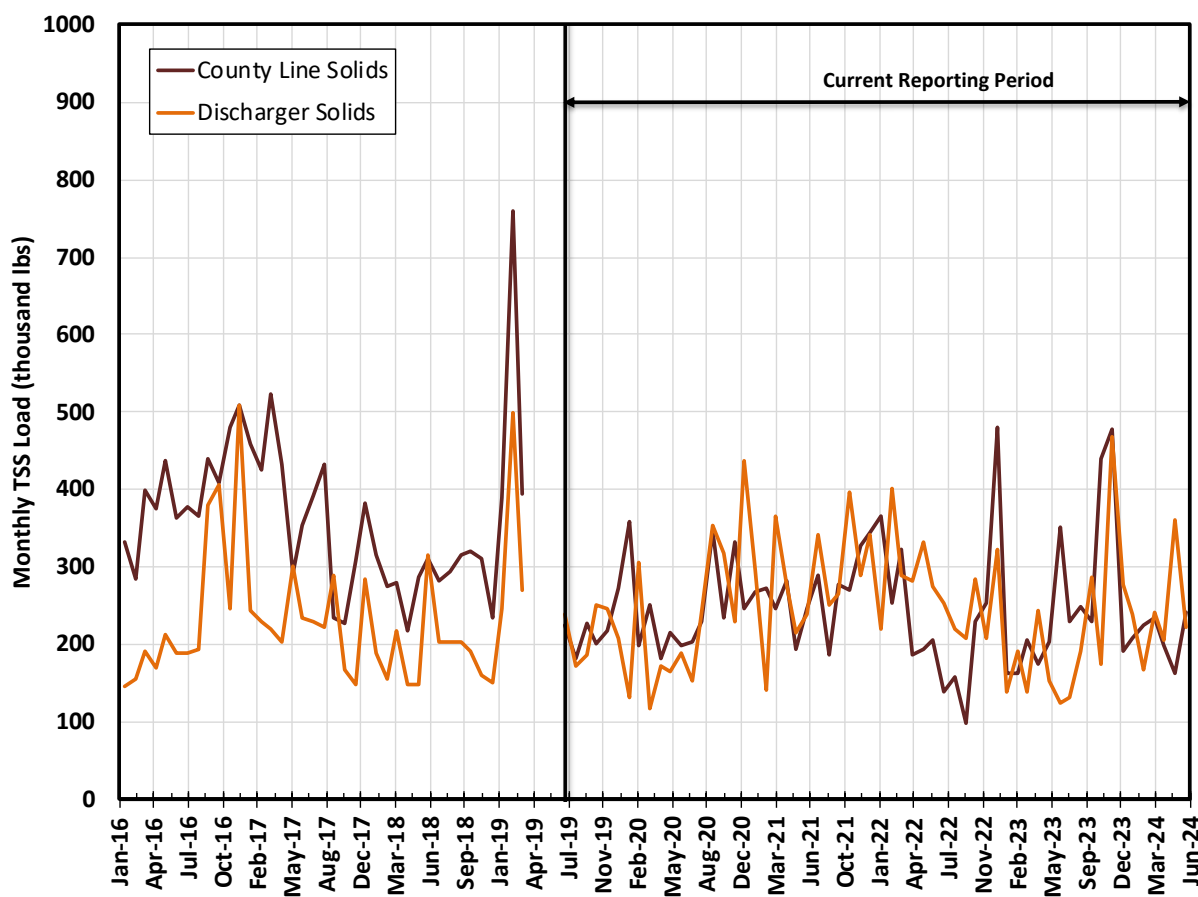


Figure 2. Total suspended solids from all dischargers compared with measured total suspended solids at S-01 from January 2016 – June 2024.

The trends between the TSS load observed at the County Line and the TSS load contributed by the combined dischargers have experienced a greater amount of fluctuation compared with trends from past reporting periods. Unlike the historical data, in which the County Line TSS load was generally higher in magnitude than the combined discharger TSS load, the current reporting period from July 2019 to June 2024 yielded more mixed results. For example, the combined discharger TSS load was higher than the County Line TSS load during the months of May and June 2022, but the County Line TSS load was higher than the combined discharger TSS load during the months of May and June 2023.

It is insightful to illustrate the difference in suspended solids loading in Figure 2 as a ratio, to visualize solids formation in the Brine Line independent of overall magnitude. Averaged on a fiscal calendar basis, the solids observed at Canyon RV Park S-01 station divided by solids input from the dischargers is provided in Figure 3. A ratio of 1 means the solids loading observed at the County Line equals that of the combined dischargers (*i.e.*, indicating no solids formation) whereas a ratio greater than 1 means that the solids loading at the County Line exceeded the suspended solids discharged to the system (*i.e.*,

suggesting solids formation). The suspended solids formation ratios for the current reporting period were at or around 1.0.

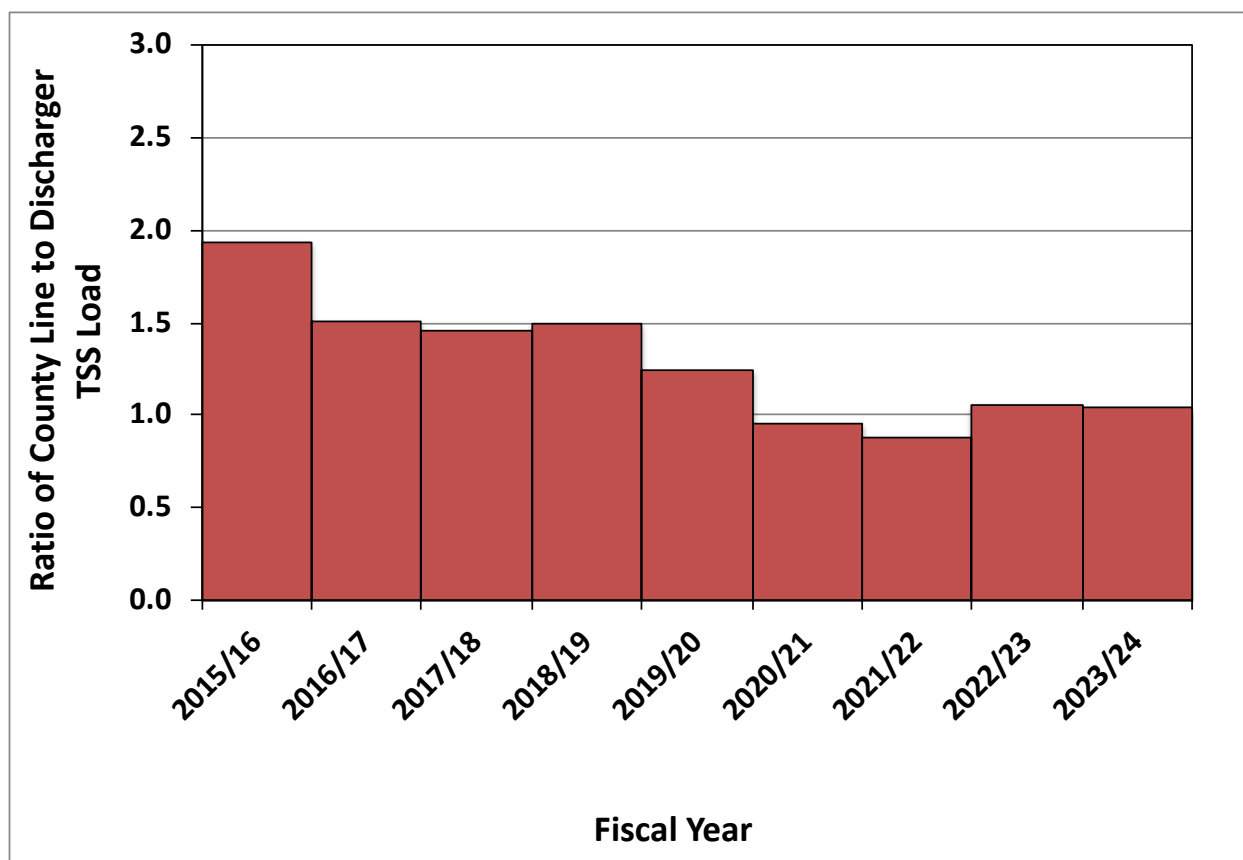


Figure 3. Relative increase in TSS in the Brine Line from the points of discharge to the County Line monitoring station on a calendar year basis (January 2015 – June 2024).

3.2 County Line

Figure 4 shows all weekly average TSS measurements from the S-01 monitoring station from January 2016 through June 2024. Figure 5 shows the weekly average TSS measurements from S-01 for the current reporting period only.

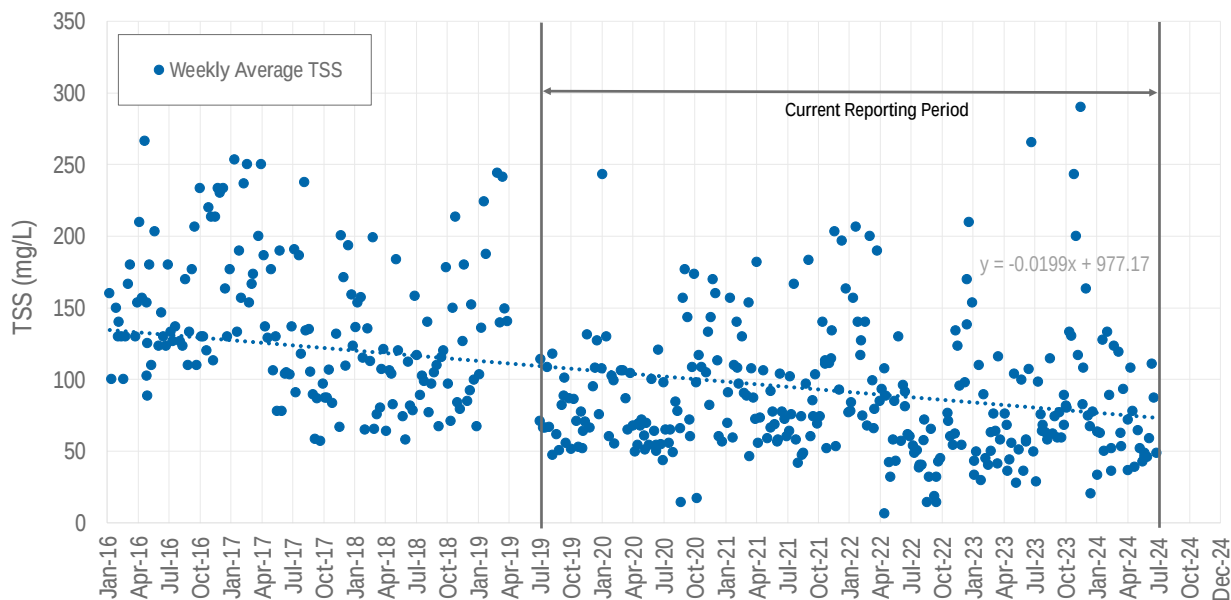


Figure 4. Weekly average TSS results at the S-01 station (January 2016 – June 2024).

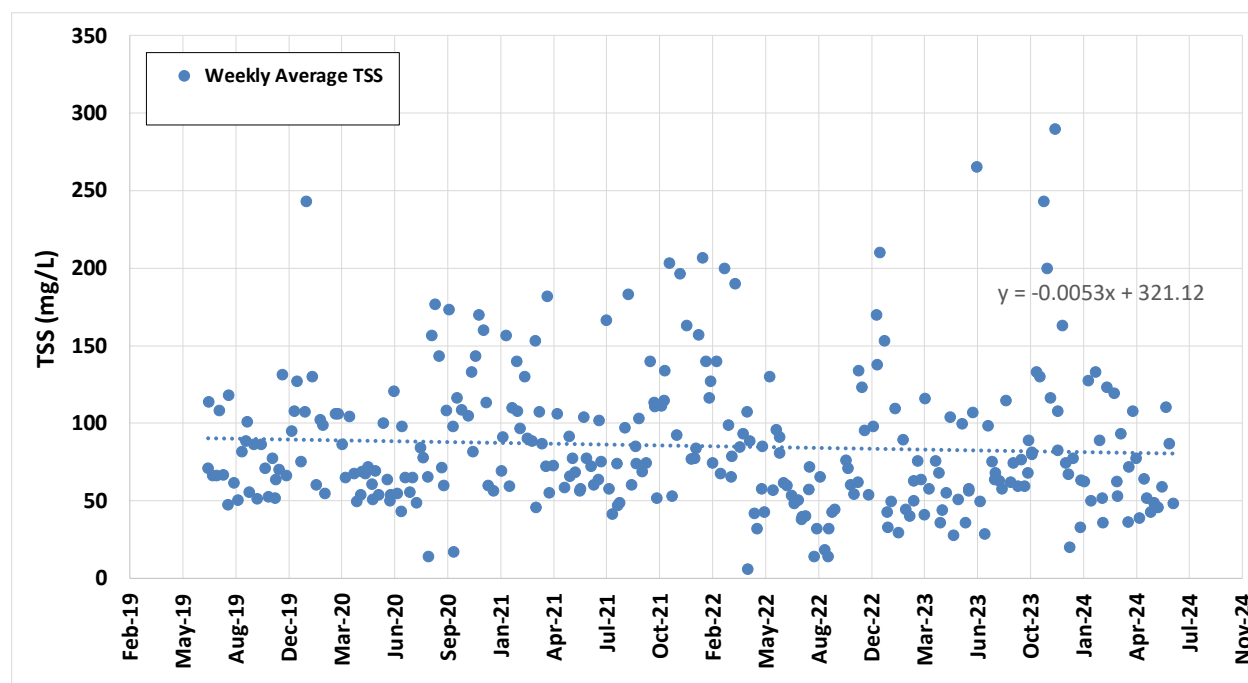


Figure 5. Weekly average TSS results at the S-01 station (July 2019 – June 2024).

As seen in Figure 5, the trendline of the current reporting period is much flatter and more consistent than the trendline in Figure 4. The overall average of the weekly average TSS measurements from S-01 during the current reporting period was 85 mg/L, as opposed to the average TSS of 106 mg/L during the wider timeframe that included historical data. Overall, weekly average TSS measurements from S-01 have been relatively stabilized over

time, however the week-to-week variability in results was persistent throughout the reporting period.

TSS and VSS measurements were taken in triplicate from S-01 on a weekly basis and then averaged by week. These average weekly values were then averaged to generate a long-term understanding of the TSS, VSS, and VSS/TSS ratio trends. Table 2 shows the average of the average values for TSS, VSS, and the VSS/TSS ratio for the current reporting period, as well as each fiscal year within that period (19/20, 20/21, 21/22, 22/23, and 23/24).

Table 2. Average TSS, VSS, and VSS/TSS ratios from County Line.

Timeframe	Average TSS (mg/L)	Average VSS (mg/L)	Average VSS/TSS Ratio
July 2019 – June 2020	81	57	72%
July 2020 – June 2021	94	75	75%
July 2021 – June 2022	97	70	70%
July 2022 – June 2023	70	49	70%
July 2023 – June 2024	84	69	76%
Period Average:	85	64	72%

The average VSS/TSS ratio for the current reporting period was 72%, which is the same value as the average for the previous reporting period of April 2018 through December 2018 (Trussell, 2019). Notably, the average VSS/TSS ratio for each fiscal year differs from the overall average, as indicated in Table 2. However, the general trend of VSS/TSS ratios for weekly samples has been consistent since January 2016, as shown in Figure 6. This is important, as this ratio provides a surrogate measure of the organic fraction of the solids.

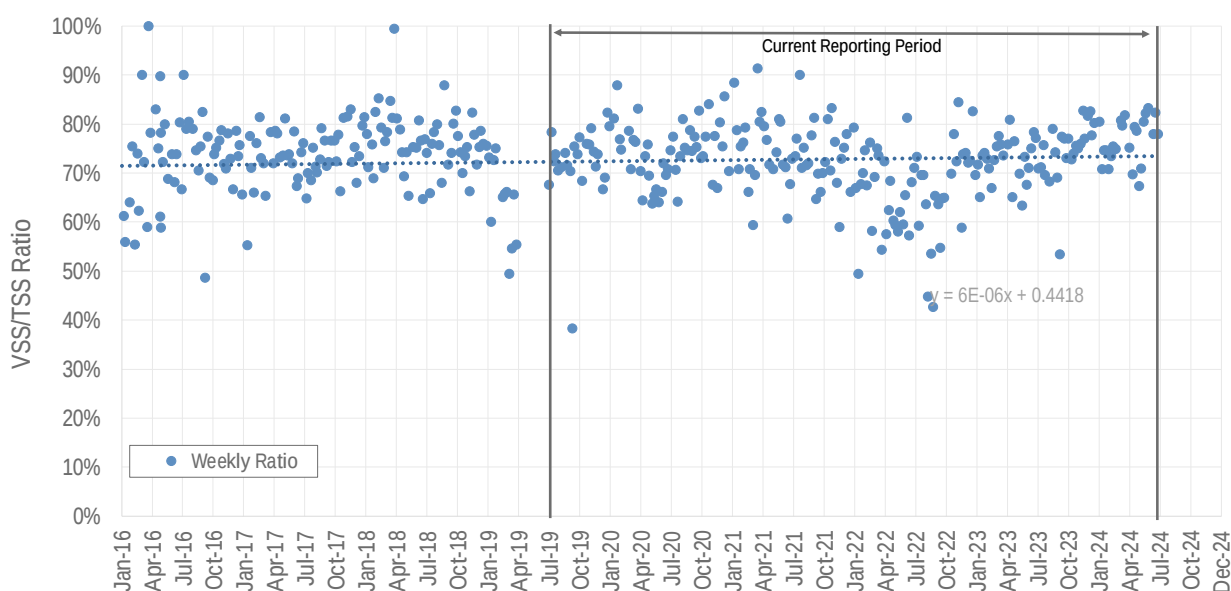


Figure 6. VSS/TSS ratio from weekly measurements at S-01 station (January 2016 – June 2024)

3.3 Dischargers

All sixty dischargers were categorized into three groups: brine, commercial, and domestic; and a profile of monthly suspended solids loading of dischargers through the Brine Line was created, as shown in Figure 7.

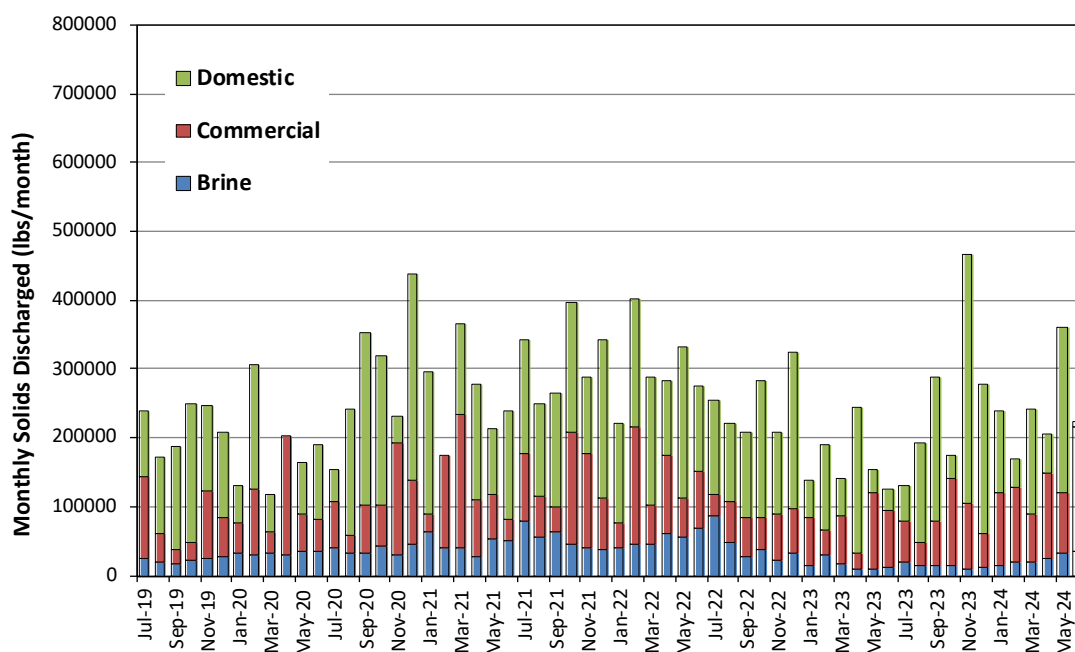


Figure 7. Brine Line discharger suspended solids loading by category (July 2019 – June 2024)

The figure illustrates how the magnitude of solids loading for the three categories of dischargers trend over time. Almost every month, the domestic dischargers comprised the majority of solids loading. The solids output by the brine dischargers grew over time and reached a peak in 2022 before decreasing again. Of the three categories, the domestic discharger loading experienced the highest amount of variability by month.

To directly compare the current dataset to the previous reporting periods, which only contained year-long datasets, the discharger data from the most recent fiscal year (2023-2024) were evaluated. The dischargers are ranked in Table 3 according to the average monthly flow for the 2023/24 fiscal period. The table also lists the average monthly loading rates for the primary water quality parameters identified as surrogates for suspended solids formation mechanisms (*i.e.*, TSS, VSS, BOD₅, calcium, and alkalinity). For each parameter, dischargers are grouped as (1) top 3 dischargers, (2) contributing to 75% of overall discharger loading, (3) contributing to 95% of overall discharger loading, and (4) other dischargers, as indicated in the legend. The data of indirect dischargers are in blue text, and the data of direct dischargers are in black text. When no data are available, the cell is marked with a hyphen. JCSD Etiwanda, JCSD Wineville, and JCSD Hamner are listed with flow and loading rates that were modified to exclude the flow and loading rates of

dischargers located immediately upstream in the same lateral, including Chino II East, Chino II West, and SCE Mira Loma Peaker Plant, respectively.

The JCSD Etiwanda flow and loading values in Table 3 have not been adjusted to account for 5 additional upstream dischargers within the JCSD lateral. These include Del Real Foods, Metal Container Corporation, Magnolia Foods, JCSD Wells 17 & 18, as well as the JCSD Roger Teagarden Ion Exchange Treatment Plant. Unlike prior monitoring periods, flow and water quality data were provided for these 5 upstream dischargers for the current period. Although the relative loading values for these 5 dischargers have been summarized in Table 3, this represents a double-counting of the flow and loading contributed by the JCSD Etiwanda location. Preliminary analysis of the discrete loading values from these dischargers relative to the JCSD Etiwanda values indicates that there is some level of solids transformation (formation and/or scaling of the lateral) within the lateral based on the available monitoring data. Further assessment would be necessary to isolate the 5 individual discharger loads and their contribution to the Brine Line solids balance, rather than using the values from JCSD Etiwanda.

Table 3. Discharger average flow and suspended solids loading rates from July 2023 through June 2024.

		Top 3	75% of loading	95% of loading									
Flow Rank	Discharger Name	Monthly Flow	Total Solids	Volatile Solids	BOD (kg/month)		Alkalinity (kg/month)		Calcium (kg/month)				
		(MG/month)	(kg/month)	(kg/month)	Total	Dissolved	Total	Dissolved	Total	Dissolved	Particulate		
1	Chino I Desalter	66.8	1474.1	783.2	1402.1	1344.7	384824.6	379272.5	276368.1	225363.8	51004.3		
2	Perris and Menifee Desalter MP001	64.2	814.5	556.6	1278.8	1147.3	176224.4	169168.4	212897.2	207677.3	12527.8		
3	Temescal Desalter	52.7	1075.4	471.5	616.1	616.1	265630.0	247086.5	167799.6	149469.6	19996.4		
4	Perris and Menifee Desalter MP002	37.3	617.1	410.7	936.2	846.4	108031.8	103594.8	126924.7	125974.7	11400.2		
5	Chino Desalter II East	32.7	354.9	196.0	540.9	540.9	76019.6	71798.6	57562.5	52447.4	7672.6		
6	JCSD Etiwanda Monitoring Station	23.7	67609.3	59343.7	45665.0	9924.0	82925.8	78942.2	9852.5	7784.2	2068.3		
7	WMWD Arlington Desalter	19.5	1610.3	569.7	301.5	253.4	119047.5	116542.1	48702.1	47432.9	2175.8		
8	City of Beaumont Wastewater Treatment Plant	16.0	69.1	64.7	466.5	434.2	74694.1	71442.9	13319.2	13016.7	605.0		
9	YVWD - Henry Wochholz Plant	12.8	160.2	146.9	374.7	309.2	13667.4	13542.4	9122.8	8756.1	488.9		
10	Mountainview Power Plant (Mountainview Gene	12.6	1132.0	367.0	298.4	262.4	-	5299.5	10107.7	8673.2	2459.1		
11	Aramark Uniform & Career Apparel, LLC	4.6	9600.5	6590.6	17112.7	7468.7	9863.7	9512.1	710.9	513.6	236.7		
12	California Institution for Women (CIW)	4.6	6480.4	6152.7	3411.2	768.7	4187.7	3783.5	898.7	825.9	79.5		
13	Mission Linen Supply	4.1	1623.0	1393.6	10503.2	8060.5	8540.6	8050.8	368.1	272.6	104.2		
14	Chino Desalter II West	3.9	333.3	98.8	69.5	69.5	22663.7	21211.9	1136.8	1034.5	153.3		
15	Del Real Foods, LLC	3.6	12984.6	8277.3	28232.7	-	-	-	1394.9	-	-		
16	Stringfellow Pretreatment Facility	3.5	74.2	66.1	162.0	107.1	2251.9	2235.7	3552.8	3488.0	388.3		
17	Metal Container Corporation	3.3	13114.8	4852.1	3959.8	-	1214.7	-	5371.5	5371.5	0.0		
18	JCSD Wineville Monitoring Station	2.5	9569.7	4566.1	3030.5	295.3	2446.9	2033.7	1126.9	954.2	213.1		
19	In-N-Out Burger, Chino Distribution Center	2.0	457.4	388.2	1290.3	-	-	-	-	-	-		
20	JCSD Hamner	1.6	4299.1	3897.8	1996.8	504.4	2662.2	2517.0	363.2	295.6	67.6		
21	Niagara Bottling, LLC (IEUA)	1.5	265.4	119.7	289.2	-	-	-	-	-	-		
22	Dart Containers	1.0	79.4	21.5	65.2	22.6	497.6	467.1	878.9	520.8	859.3		
23	Californian Institution for Men (CIM)	0.97	46.9	15.3	14.3	4.3	6633.0	3705.2	5535.5	5447.1	353.5		
24	Niagara Bottling, LLC (SBMWD)	0.90	340.3	215.0	351.6	-	-	-	2294.4	-	-		
25	Rialto Bioenergy Solutions	0.86	40.7	29.1	42.5	-	-	-	507.7	-	-		
26	Repet, Inc.	0.85	2618.9	2126.2	7091.2	5076.5	3593.7	3370.6	181.9	115.3	80.0		
27	OLS Energy - Chino	0.49	9.5	9.5	4.4	3.8	476.1	174.0	199.1	184.2	19.9		
28	Infineon Technologies Americas Corp.	0.44	202.3	66.1	43.8	43.8	-	-	122.3	44.6	77.6		
29	Wellington Foods	0.35	185.7	140.3	2095.1	1316.0	697.3	514.1	81.3	51.8	39.3		
30	Eastside Water Treatment Plant	0.32	40.3	11.0	4.5	1.8	1203.1	1152.0	1515.9	1118.2	530.3		
31	JCSD Roger D. Teagarden IX Water Treatment Pl	0.28	24.6	1.7	5.3	5.3	608.7	588.4	57.0	20.3	36.7		
32	Magnolia Foods	0.18	644.2	395.8	1797.8	-	954.6	-	208.2	208.2	0.0		
33	JCSD Wells 17 * 18 Ion Exchange Treatment Faci	0.16	12.0	1.2	6.0	3.0	222.9	204.8	17.5	17.5	0.0		
34	Flavor Specialties	0.14	98.3	78.5	697.7	548.3	397.0	382.2	24.0	20.9	5.4		
35	Green River Golf Course (GRGC)	0.12	106.7	91.9	133.2	18.3	79.5	78.1	34.9	28.8	9.0		
36	Inland Water Services	0.12	13.6	4.6	15.6	-	-	-	3221.4	-	-		
37	WRCRWA - South Regional Pumping Station	0.11	469.6	469.6	303.9	-	-	-	-	-	-		
38	RCSD	0.094	8.9	1.2	2.0	1.5	1179.0	1151.1	24.6	19.0	5.6		
39	Saratoga Food, Inc.	0.082	390.4	359.7	701.2	-	-	-	19.1	-	-		
40	City of Colton - Agua Mensa Power Plant	0.059	1.1	0.6	1.5	1.4	-	24.7	23.7	21.4	4.7		
41	Sierra Aluminum Company, Inc.	0.059	0.9	0.6	1.1	-	-	-	79.4	-	-		
42	Angelica Textile Services	0.049	2.0	0.9	1.2	-	-	-	805.9	-	-		
43	Loma Linda University Power Plant	0.030	0.9	0.5	0.5	-	-	-	352.3	-	-		
44	SCE Mira Loma Peaker Plant	0.025	0.2	0.2	0.4	0.4	-	-	-	-	-		
45	Prudential Overall Supply	0.020	0.9	0.3	0.7	-	-	-	167.2	-	-		
46	Decra Roofing Systems	0.010	2.3	2.2	6.8	-	-	-	12.3	-	-		
47	Loma Linda Veterans Affairs (VA) Medical Center	0.009	0.4	0.2	0.2	-	-	-	96.0	-	-		
48	Qualified Mobile, Inc.	0.008	3.7	0.4	0.2	-	-	-	20.1	-	-		
49	Indian Oaks Campground	0.007	0.2	0.1	0.0	-	-	-	-	-	-		
50	San Antonio Regional Hospital	0.005	0.4	0.2	2.1	-	-	-	-	-	-		
51	JCSD Chandler Lift Station	0.002	0.7	0.7	0.8	-	-	-	-	-	-		
52	La Sierra University	0.002	0.0	0.0	0.0	-	-	-	-	-	-		



As shown in Table 3, the dischargers that generated the most flow also produced the highest amount of alkalinity and calcium loading: Chino I Desalter and Chino Desalter II East, Perris and Menifee Desalter MP001 and 002, and Temescal Desalter. However, that was not true of the top TSS, VSS, and BOD₅ dischargers, who were lower in the flow ranking, including JCSD Etiwanda, Del Real Foods, Aramark Uniform & Career Apparel, and Metal Container Corporation.

A summary of average discharger loading into the Brine Line for each monitoring parameter is shown below in Table 4. The table compares the most recent fiscal year with the preceding three reporting periods.

Table 4. Summary of discharger loadings for the most recent fiscal year (July 2023 – June 2024) and the last three reporting periods.

Parameter	2017 Report	2018 Report	2019 Report	Most Recent Fiscal Year
	August 2016 – March 2017	April 2017 – March 2018	April 2018 – December 2018	July 2023 – June 2024
Flow (MG/mo)	317	313	314	374
TSS (lb/mo)	307,200	217,500	202,100	247,600
VSS (lb/mo)	189,600	177,800	170,000	187,100
BOD ₅ (lb/mo)	249,500	261,000	222,700	223,400
Dissolved BOD ₅ (lb/mo)	113,400	125,400	115,000	88,200
Alkalinity (lb/mo)	1,871,400	2,598,400	2,192,000	3,017,400
Dissolved Alkalinity (lb/mo)	2,418,700	2,363,700	1,336,600	2,904,100
Calcium (lb/mo)	1,759,800	1,631,300	786,300	2,110,200
Dissolved Calcium (lb/mo)	1,598,500	1,560,300	754,500	1,899,700

Comparing the results from the most recent fiscal year with the previous discharger loadings in Table 4, flow has increased from the historical data. Since the last reporting period (April 2018 through December 2018), all water quality parameters increased except for dissolved BOD₅ (-30%). Dissolved alkalinity (54%), calcium (63%), and dissolved calcium (60%) doubled or nearly tripled in value, whereas TSS (18%), VSS (9%), and alkalinity (27%) saw more modest increases. BOD₅ increased but remained mostly flat (0.3%).

4 Recommendations

This preliminary review of the Brine Line water quality data provides an initial understanding of the water quality and trends in the Brine Line from the past five years. Based on these findings, additional monitoring is needed to support the development of an updated billing formula to account for changes in solids loading through the Brine Line

system. Trussell will develop a suggested supplemental monitoring plan that incorporates the following key recommendations:

- Further evaluation of the Brine Line flow data is needed, with the goal of aligning the values measured at the County Line with the combined discharger flow measurements.
- Supplemental monitoring of the dischargers that were determined to contribute to the top 75% of the loading for any of the water quality parameters historically used in the billing formula (TSS, VSS, BOD, alkalinity, calcium). In particular, this supplemental monitoring should provide the following:
 - Analysis of all monitoring parameters from a single sample, including the dissolved fractions. This will allow for correlation of all monitoring parameters among locations.
 - Three monitoring events for the dischargers that contribute to the top 75% of the loading for TSS, VSS, and BOD. The results for these parameters tend to be more variable from sample to sample, thus a single sample may not be representative.
- For dischargers that had no data from the 2023/2024 fiscal year period, it is recommended to collect one representative sample from which all of the monitoring parameters should be analyzed.
- Three monitoring events should be completed at the County Line from which all of the liquid fraction water quality parameters are analyzed. This same liquid sample should be processed to separate the solid fraction for solids characterization using the previously recommended analyses (Trussell 2019), including metals, particulate organic carbon, x-ray diffraction, scanning electron microscopy with energy dispersive x-ray spectroscopy, and thermogravimetric analysis.

5 References

Trussell (2011). “Understanding the Suspended Solids in the Inland Empire Brine Line.” Workshop presentation to the *Santa Ana Watershed Project Authority*. Dec 20.

Trussell (2012). “Understanding Control of Suspended Solids Formation in the Inland Empire Brine Line.” Workshop presentation to the *Santa Ana Watershed Project Authority*. Jun 12.

Trussell (2013). “Inland Empire Brine Line Green River Monitoring Station (S-01) Water Quality Monitoring Report: April 2012 through March 2013.” Report for the *Santa Ana Watershed Project Authority*. July 18.

Trussell (2015). “Inland Empire Brine Line Green River Monitoring Station (S-01) Water Quality Monitoring Report: April 2013 through March 2015.” Report for the *Santa Ana Watershed Project Authority*. June 9.

Trussell (2016a) “Evaluation of Variability of TSS and BOD Measurements from the Brine Line.” Report for the *Santa Ana Watershed Project Authority*. January 21.

Trussell (2016b) “Canyon RV Park S-01 Troubleshooting Summary.” Report for the *Santa Ana Watershed Project Authority*. February 12.

Trussell (2016c). “Inland Empire Brine Line – Canyon RV Park S-01 Water Quality Monitoring Report, March 2015 through December 2015.” Report for the *Santa Ana Watershed Project Authority*. May 10.

Trussell (2016d). “Brine Line and Discharger Sampling Test Plan.” Report for the *Santa Ana Watershed Project Authority*. May 9.

Trussell (2016e). “Proposed Solids Formation Recovery Formula for the Inland Empire Brine Line.” Report for the *Santa Ana Watershed Project Authority*. October 10.

Trussell (2017). “Inland Empire Brine Line Water Quality Monitoring & Solids Formation Recovery Formula Report August 2016 through March 2017.” Report for the *Santa Ana Watershed Project Authority*. July 21.

Trussell (2018). “Inland Empire Brine Line Water Quality Monitoring & Solids Formation Recovery Formula Report April 2017 through March 2018.” Report for the *Santa Ana Watershed Project Authority*.

Trussell (2019). “Inland Empire Brine Line Water Quality Monitoring & Solids Formation Recovery Formula Report April 2018 through March 2019.” Report for the *Santa Ana Watershed Project Authority*. September 5.



10 Appendix B – Sampling Test Plan, February 2025



SAMPLING TEST PLAN

Santa Ana Watershed Project Authority

Draft Date: February 27, 2025

Authors: Aidan Hasegawa
Wen Cong, Ph.D.

Reviewers: Emily Owens-Bennett, P.E., BCEE

Subject: Inland Empire Brine Line and Discharger Sampling Test Plan

1 Introduction

Trussell Technologies, Inc. (Trussell) was first retained by the Santa Ana Watershed Project Authority (SAWPA) in mid-2011 to assess the formation of suspended solids in the Inland Empire Brine Line (Brine Line). Since that time, Trussell has been involved in a series of investigations aimed at characterizing the suspended solids from the sampling point (SMS) closest to the Orange County Line (County Line), where the ownership of the wastewater within the Brine Line is transferred from SAWPA to the Orange County Sanitation District (OC San). In the first phase of the current Brine Line water quality and billing formula study (Study), Trussell determined that additional monitoring would be needed to complete the assessment of changes in solids loading through the Brine Line during the current reporting period from July 2019 through June 2024.

This document provides a sampling test plan aimed at monitoring for the Brine Line system to characterize the discharger inputs and downstream water quality, in order to evaluate the suspended solids formed within the Brine Line system. The first section describes recommended monitoring at the County Line SMS station, which includes field measurements and performing three sampling events for subsequent liquid fraction and solids characterization analyses. The second section describes recommended monitoring at the dischargers to the Brine Line, including field measurements and sampling events for subsequent liquid fraction analyses. Depending on the discharger's historically established solids loading rate, these sampling events will occur either once, monthly, or quarterly within the period of April through June 2025.

2 County Line Sampling Plan

Trussell recommends that SAWPA perform three special sampling events at the County Line SMS station to facilitate characterization of the solids fraction of the Brine Line flow. For each of these events, a large volume 24-hour composite sample will be needed. These

sampling events will be performed biweekly (once every 2 weeks). In each event, the following activities will occur:

1. **(Trussell and SAWPA)** Coordinate sampling events with participating analytical labs. Trussell will work with Camet Research to confirm availability and sample preparation requirements. SAWPA will coordinate with Babcock Laboratories to arrange bottle orders, set up chain of custody forms, and schedule sampling events.
2. **(SAWPA)** Collect a 24-hour composite sample of at least 8 gallons from the SMS monitoring station. SAWPA previously used a 12-gallon container that was purchased for these solids characterization sampling events.
3. **(SAWPA and Trussell)** Once sampled, each 24-hour composite sample will be mixed on-site using a mechanical mixer and then distributed into labelled bottles for subsequent liquid fraction and solids characterization analyses. Trussell will support SAWPA with on-site sample processing.
 - a. SAWPA to provide 4 clean one-gallon plastic jugs to hold Trussell's samples.
4. **(SAWPA)** Composite sample bottles will be loaded in coolers with ice packs and delivered to Babcock Laboratories with overnight shipping. Babcock Laboratories will use these bottles to perform liquid fraction water quality analyses.
5. **(Trussell)** At least 4 gallons of composite sample will be transported by Trussell on ice to the Trussell Lab for solids processing. Trussell will centrifuge the liquid sample to concentrate and separate the suspended solids (disposing the liquid supernatant).
6. **(Trussell)** Ship the wet solids to the Camet Research for analysis.
7. **(Trussell)** Help SAWPA coordinate with the labs to obtain test results for data analysis.

Table 1 shows a summary of the recommended liquid fraction water quality parameters and solids characterization analyses of the County Line samples. The liquid fraction sample analyses shall incorporate the use of total suspended solids (TSS) glass fiber filters (pore size of 1.5 microns) to separate the total and dissolved fractions of 5-day biochemical oxygen demand (BOD₅), alkalinity, calcium, and orthophosphate. This distinction is made because the 1.5-micron threshold will be used to define the suspended solids (via analysis of TSS), and the 'dissolved' constituents will represent the remainder of the sample. Flow through the County Line SMS monitoring station and pH will be continuously measured via online meters. Separately, pH and temperature will be measured via grab samples during every sampling event. Due to general variability in TSS, volatile suspended solids (VSS), and total BOD₅ measurements, it is recommended for SAWPA to collect three aliquots for analysis of these constituents, from which Babcock Laboratories will perform triplicate liquid fraction analyses (three total results for each parameter).

Table 1. Recommended County Line Sampling and Analyses.

Constituent/Analysis	Test Method	Responsible Party	Notes
Field Measurements			
Flow	--	SAWPA	Online monitoring; total per 24-hour sampling event.
pH	--	SAWPA	Online monitoring and grab sample analysis during every sampling event.
Temperature	--	SAWPA	Grab sample analysis during each sampling event.
Liquid Fraction Sampling			
Total Suspended Solids (TSS)	SM 2540D	Babcock Laboratories	Expedited analysis (< 24-hour hold); Analysis in triplicate
Volatile Suspended Solids (VSS)	EPA 160.4	Babcock Laboratories	Expedited analysis (< 24-hour hold); Analysis in triplicate
Biochemical Oxygen Demand (BOD ₅)	SM 5210B	Babcock Laboratories	Total and dissolved ^(a) ; Total analysis in triplicate
Alkalinity	SM 2320B	Babcock Laboratories	Total and dissolved ^(a)
Calcium	EPA 200.7	Babcock Laboratories	Total and dissolved ^(a)
Total Dissolved Solids (TDS)	SM 2540C	Babcock Laboratories	
Orthophosphate	SM 4500P E	Babcock Laboratories	Total and dissolved ^(a)
Dissolved Organic Carbon (DOC)	SM 5310B	Babcock Laboratories	Using TSS filter substitution ^(a)
Solids Characterization (Trussell to separate solids via centrifugation)			
X-ray diffraction (XRD)	XRD	Camet Research	Provides mineral characterization
Wavelength Dispersive X-ray Fluorescence Spectroscopy (WDXRF)	WDXRF	Camet Research	Provides elemental characterization
Thermogravimetric analysis (TGA)	TGA	Camet Research	Provides cellulose identification and organics quantification

^(a)All filtered measurements shall be filtered using a 1.5-micron glass fiber filter

3 Discharger Sampling Plan

For dischargers, no solids characterization will be conducted. Instead, Trussell recommends sampling for the suite of water quality parameters listed in Table 2, following the sampling frequency recommended for each discharger in Table 3. The sampling frequencies in Table 3 were updated from the 2019 monitoring plan and based on the recent preliminary review of water quality from July 2019 through June 2024. Note that this sampling can be conducted in accordance with regular monthly/quarterly discharger sampling during the period of April through June 2025, which will result in between one and three sampling events for each discharger, based on the recommended monitoring frequency. The discharger sampling and analysis should use the following criteria:

1. Similar to the County Line sampling, each discharger sampling event shall produce 24-hour composite samples. SAWPA shall determine the composite sample volume required to meet the specified analyses in Table 2.
2. Each composite sample should be analyzed for all constituents listed in Table 2 to allow for correlation between the results from a representative sample. If the analysis of a single parameter must be repeated due to an error in monitoring or analysis, it is recommended to repeat the 24-hour composite sampling and re-analyze the entire suite of water quality parameters.
3. The water quality parameters in Table 2 shall be measured in a similar manner to the County Line sampling. Each composite sample will be mixed on-site with the mechanical mixer and distributed into bottles. All sample bottles will be sent to Babcock Laboratories for liquid fraction analyses. The ‘dissolved’ constituents will be filtered via the 1.5-micron glass fiber filter (consistent with the TSS measurement). Flow will be monitored using online flowmeters and the sum over the 24-hour sampling event will be recorded. pH and temperature will be monitored via grab samples. TSS, VSS, and total BOD₅ analyses will be performed in triplicate.
4. Table 3 lists the forty-seven active dischargers along with their recommended sampling frequencies based on Trussell’s preliminary assessment of their FY 2023 solids loading to the Brine Line. M represents monthly sampling, Q is for quarterly sampling, and dischargers listed with an asterisk (*) for their sampling frequency should be sampled at least once during April – June 2025 to characterize their recent solids loading rates. If a new discharger comes online during this period, it is recommended to assign quarterly sampling frequency to the discharger to establish water quality data.

Table 2. Recommended Discharger Sampling and Analyses.

Constituent/Analysis	Test Method	Responsible Party	Notes
Field Measurements			
Flow	--	SAWPA/Dischargers	Online monitoring; total per 24-hour sampling event
pH	--	SAWPA/Dischargers	Online monitoring or grab sample during each sampling event
Temperature	--	SAWPA/Dischargers	Online monitoring or grab sample during each sampling event
Liquid Fraction Sampling (derived from one composite sample)			
Total Suspended Solids (TSS)	SM 2540D	Babcock Laboratories	Expedited analysis (< 24-hour hold); Analysis in triplicate
Volatile Suspended Solids (VSS)	EPA 160.4	Babcock Laboratories	Expedited analysis (< 24-hour hold); Analysis in triplicate
Biochemical Oxygen Demand (BOD ₅)	SM 5210B	Babcock Laboratories	Total and dissolved ^(a) ; Total analysis in triplicate
Alkalinity	SM 2320B	Babcock Laboratories	Total and dissolved ^(a)
Calcium	EPA 200.7	Babcock Laboratories	Total and dissolved ^(a)

^(a)All filtered measurements shall be filtered using a 1.5-micron glass fiber filter

Table 3. Recommended Discharger Sampling Frequency.

Discharger	Sampling Frequency
Angelica Textile Services	*
Aramark Uniform & Career Apparel, LLC	M
California Institution for Women (CIW)	M
Californian Institution for Men (CIM)	Q
Chino Desalter II East	M
Chino Desalter II West	Q
Chino I Desalter	M
City of Beaumont Wastewater Treatment Plant	M
City of Colton - Agua Mensa Power Plant	*
Dart Containers	Q
Decra Roofing Systems	*
Eastside Water Treatment Plant	Q

Discharger	Sampling Frequency
Flavor Specialties	M
Green River Golf Course (GRGC)	Q
In-N-Out Burger, Chino Distribution Center	M
Indian Oaks Campground	*
Infineon Technologies Americas Corp.	*
Inland Water Services	*
JCSD Chandler Lift Station	*
JCSD Etiwanda Monitoring Station	M
JCSD Hamner	M
JCSD Wineville Monitoring Station	M
La Sierra University	*
Loma Linda University Power Plant	*
Loma Linda Veterans Affairs (VA) Medical Center	*
Mission Linen Supply	M
Mountainview Power Plant (Mountainview Generating Station)	M
Niagara Bottling, LLC (IEUA)	*
Niagara Bottling, LLC (SBMWD)	*
OLS Energy – Chino	Q
Perris and Menifee Desalter MP001	M
Perris and Menifee Desalter MP002	M
Prudential Overall Supply	*
Qualified Mobile, Inc.	*
RCSD	Q
Repet, Inc.	M
Rialto Bioenergy Solutions	*
San Antonio Regional Hospital	*
Saratoga Food, Inc.	*
SCE Mira Loma Peaker Plant	*
Sierra Aluminum Company, Inc.	*
Stringfellow Pretreatment Facility	Q
Temescal Desalter	M
Wellington Foods	M
WMWD Arlington Desalter	M
WRCRWA - South Regional Pumping Station	*
YVWD - Henry Wochholz Plant	Q

The collection of these discharger samples, together with downstream sample collection at the County Line (SMS) described in Section 2, will provide the necessary data for establishing suspended solids loading values throughout the Brine Line system that are representative of current operations.

4 Logistics

The discharger and County Line sampling and water quality analyses presented in this plan are scheduled for April 2025 through June 2025. During this timeframe, SAWPA will sample at the dischargers with the associated sampling frequencies listed in Table 3. Any dischargers that have an asterisk (*) for their sampling frequency listed in Table 3 will be sampled at least once during this period. In addition, three sampling events will be conducted at the County Line (SMS) at a two-week interval. SAWPA will coordinate the sampling in cooperation with its member agencies.

5 References

Trussell (2019). "Inland Empire Brine Line Water Quality Monitoring & Solids Formation Recovery Formula Report April 2018 through March 2019." Report for the *Santa Ana Watershed Project Authority*. September 5.

11 Appendix C – Top Dischargers Representing Top 75% of Overall Loading for Each Monitoring Parameter

The following pie charts (Figure C 1 through Figure C 9) identify the top dischargers representing at least 75% of the overall loading for each monitoring parameter from the July 2023 – June 2025 (excluding July 2024 – March 2025) period, compared with the results from the previous reporting period (2019).

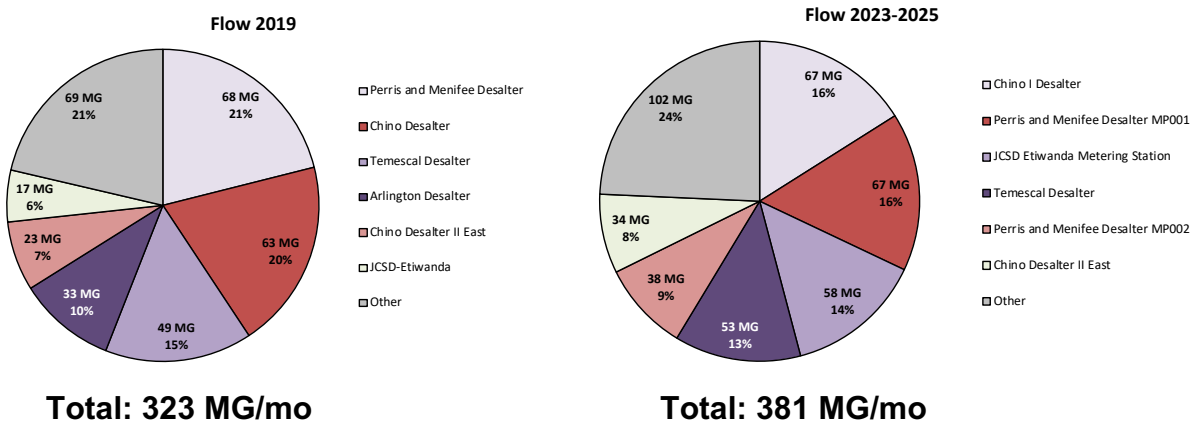


Figure C 1. Flow pie charts for 2019 and 2023-2025, including top dischargers contributing 75% or greater

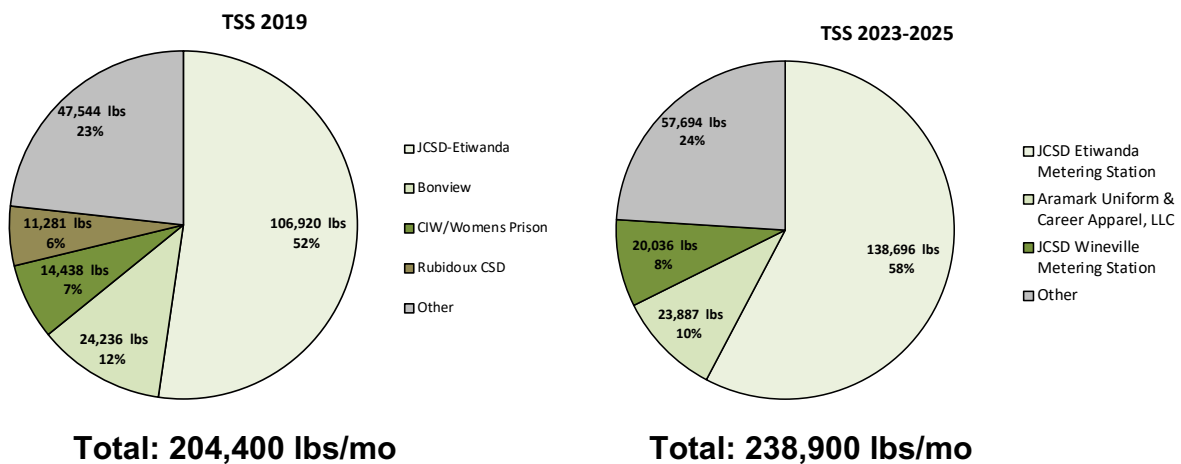


Figure C 2. TSS loading pie charts for 2019 and 2023-2025, including top dischargers contributing 75% or greater

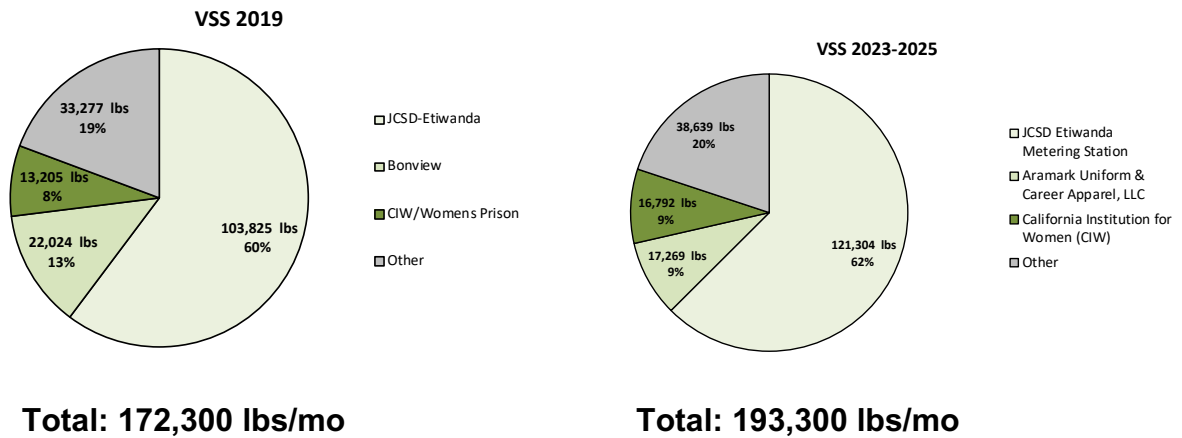


Figure C 3. VSS loading pie charts for 2019 and 2023-2025, including top dischargers contributing 75% or greater

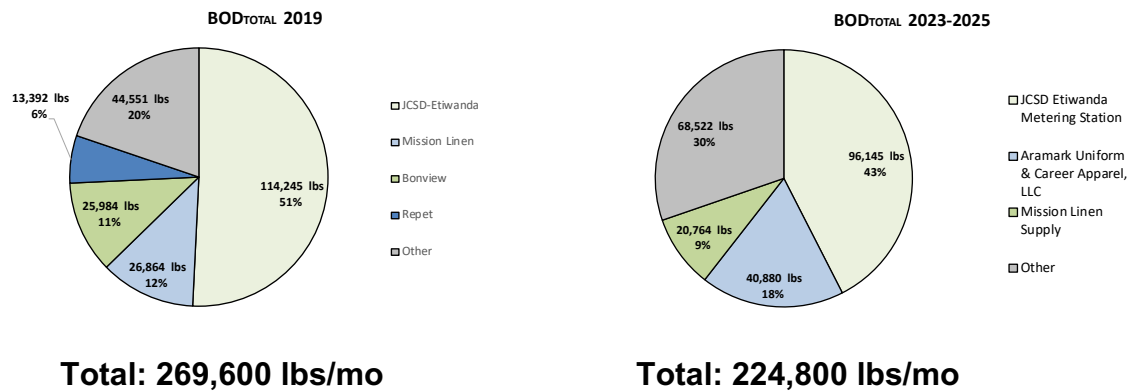


Figure C 4. Total BOD₅ loading pie charts for 2019 and 2023-2025, including top dischargers contributing 75% or greater

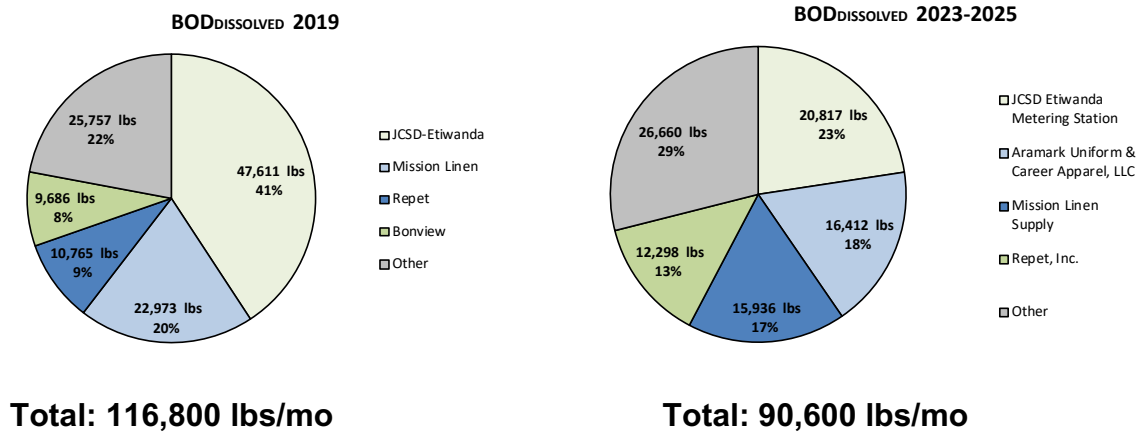


Figure C 5. Dissolved BOD₅ loading pie charts for 2019 and 2023-2025, including top dischargers contributing 75% or greater

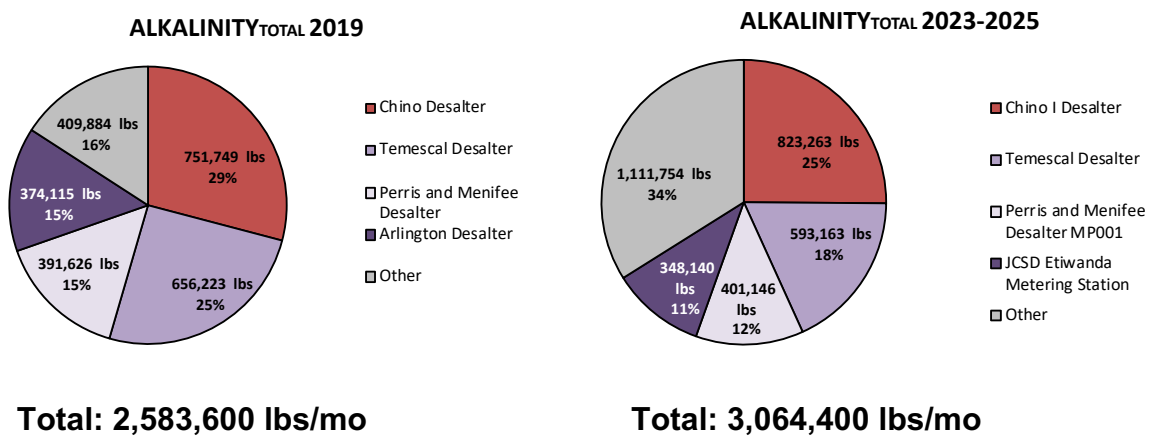


Figure C 6. Total alkalinity loading pie charts for 2019 and 2023-2025, including top dischargers contributing 75% or greater

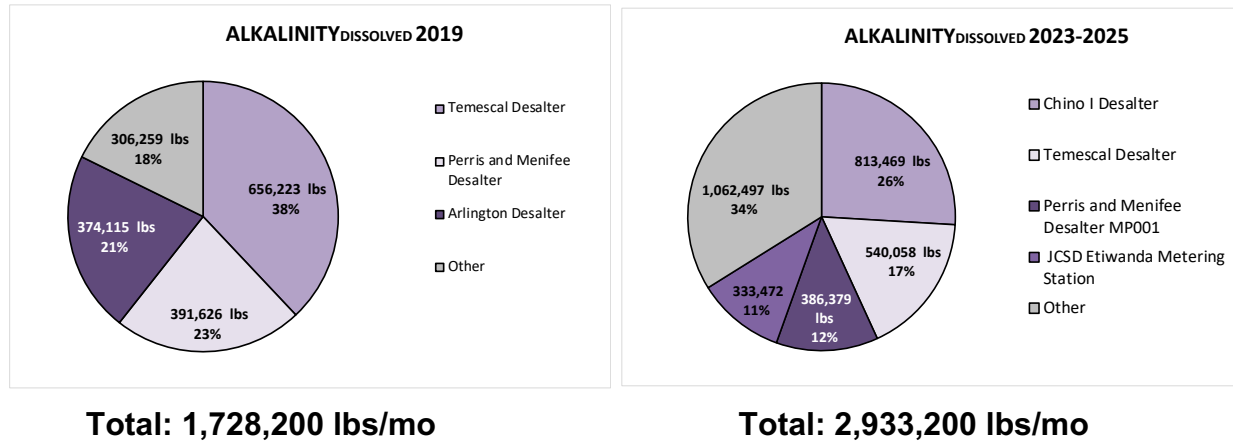


Figure C 7. Dissolved alkalinity loading pie charts for 2019 and 2023-2025, including top dischargers contributing 75% or greater

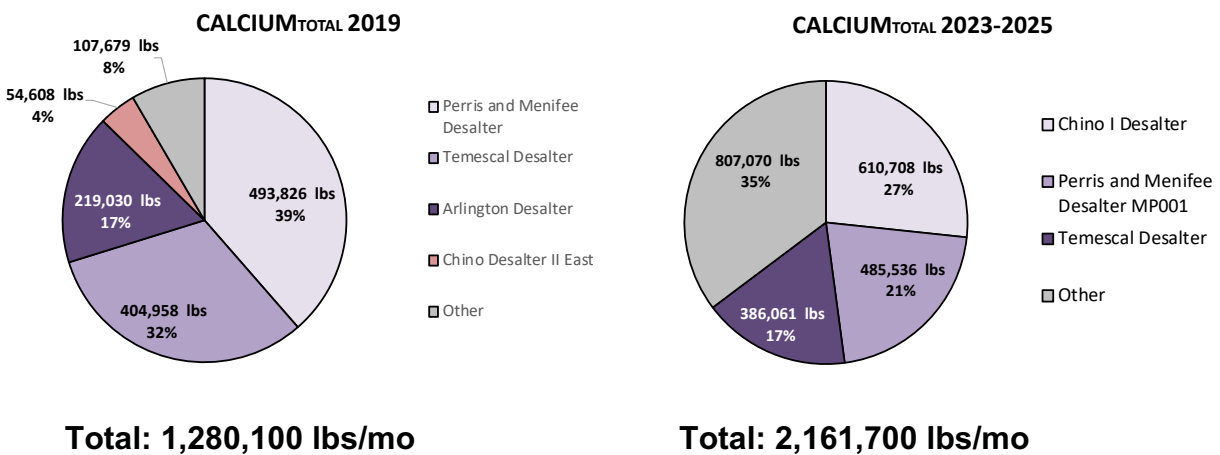


Figure C 8. Total calcium loading pie charts for 2019 and 2023-2025, including top dischargers contributing 75% or greater

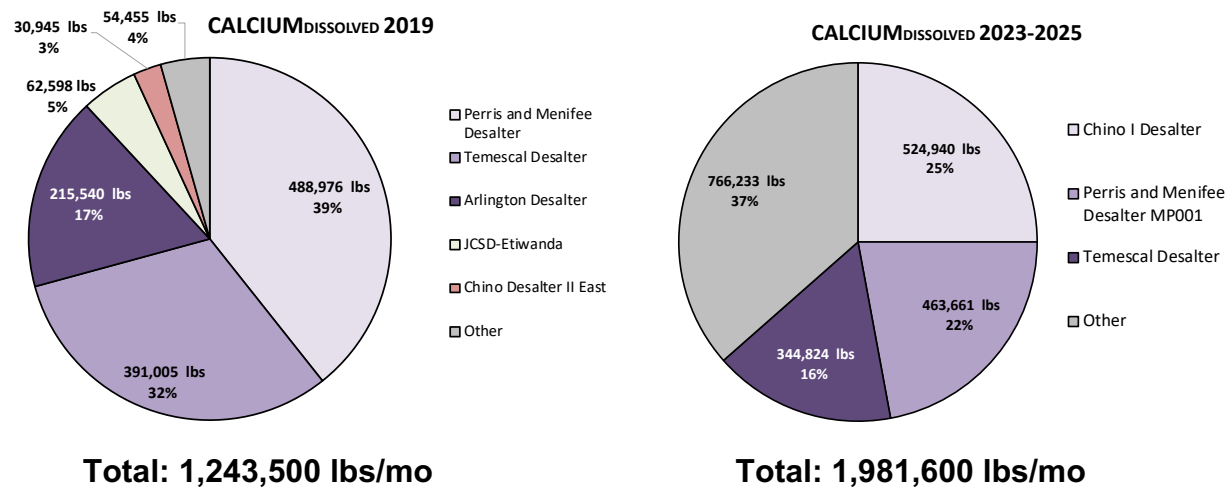
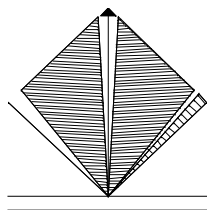


Figure C 9. Dissolved calcium loading pie charts for 2019 and 2023-2025, including top dischargers contributing 75% or greater



12 Appendix D – Camet Research Lab Results for the Three Solids Characterization Events

**Aidan Hasegawa**

May 8, 2025

Trussell Technologies Inc.
1904 Franklin Street, Suite 800
Oakland, CA 94612

RE: Analysis of Waste Water Sludge, Santa Ana Watershed Project Authority (SAWPA)
PO No.: 2025-49
Report No.: 80020225

INTRODUCTION

A wet sludge sample was characterized using X-ray powder diffraction (XRD), WDXRF and thermogravimetric methods. The sample was received on May 2, 2025 and identified as follows:

Item	Description	Sample Date
(1)	SAWPA, 001 / SO-1 (Canyon Park RV) Mag Meter – Line 2 Sample ID: 98154	05/01/25

SAMPLING AND TESTING METHODS

The as-received sludge was dried at 50°C in air and split into representative test portions. The crystalline phase compositions of dried (at 50°C) and calcined (at 950°C) aliquots were determined by X-ray powder diffraction. XRD data sets were collected on a Rigaku wide angle powder diffractometer using CuK α radiation (8.1keV) and a diffracted beam monochromator. The results are listed in Table 1 and illustrated in Figures 1 and 2.

Elemental compositions were estimated for test portions dried at 50°C and calcined at 450°C using a standard-less method and datasets collected on a Rigaku ZSX Priums IV WDXRF spectrometer. Elemental results are listed in Table 2 and illustrated in Figure 4. The estimated composition of the dried sludge material is listed in Table 4.

Thermogravimetric analysis (TGA) was performed using a Perkin Elmer TGA 7 with a high temperature furnace in ambient air atmosphere. The results are listed in Table 3 and illustrated in Figure 3.

Please let us know if you have any questions regarding these results,

TABLES

Table 1. Normalized mineral composition of sample #98154, May 1, 2025

Mineral Name / Chemical Formula	Calcined at 950°C	Dried at 50°C
	wt%	wt%
Hydroxyapatite, $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$	38.5	
Merillite, $\text{Ca}_9\text{NaMg}(\text{PO}_4)_7$	15.0	
Diopside, $\text{CaMgSi}_2\text{O}_6$	25.0	
Lime, CaO	3.5	
Anhydrite, CaSO_4	2.5	
Nepheline, $(\text{Na,K})\text{AlSiO}_4$	13.5	
Not Identified	< 5	<5
Calcite, CaCO_3		observed
Quartz, SiO_2	2.0	observed

Table 2. Normalized and corrected oxide composition of the dried and calcined sludge material

Oxides / Elements	98154, dried at 50°C	98154, dried at 50°C corrected for LOI	98154, calcined at 450°C
	wt%	wt%	wt%
Na_2O	1.38	0.34	1.88
MgO	2.43	0.60	2.15
Al_2O_3	6.69	1.65	7.34
SiO_2	13.49	3.34	16.23
P_2O_5	13.21	3.27	12.71
SO_3	8.14	2.01	2.12
Cl	3.30	0.82	2.18
K_2O	1.89	0.47	1.95
CaO	37.45	9.27	41.96
TiO_2	1.29	0.32	1.40
Cr_2O_3	0.11	0.03	0.13
MnO	0.19	0.05	0.22
Fe_2O_3	9.35	2.31	8.81
NiO	0.05	0.01	
Co_2O_3			0.01
CuO	0.18	0.04	0.18
ZnO	0.60	0.15	0.53
As_2O_3	0.02	0.00	
Br	0.03	0.01	0.02
SrO	0.20	0.05	0.17
LOI at 450°C		75.25	
Total	100	100	100

Table 3. Weight loss data as determined by TGA.

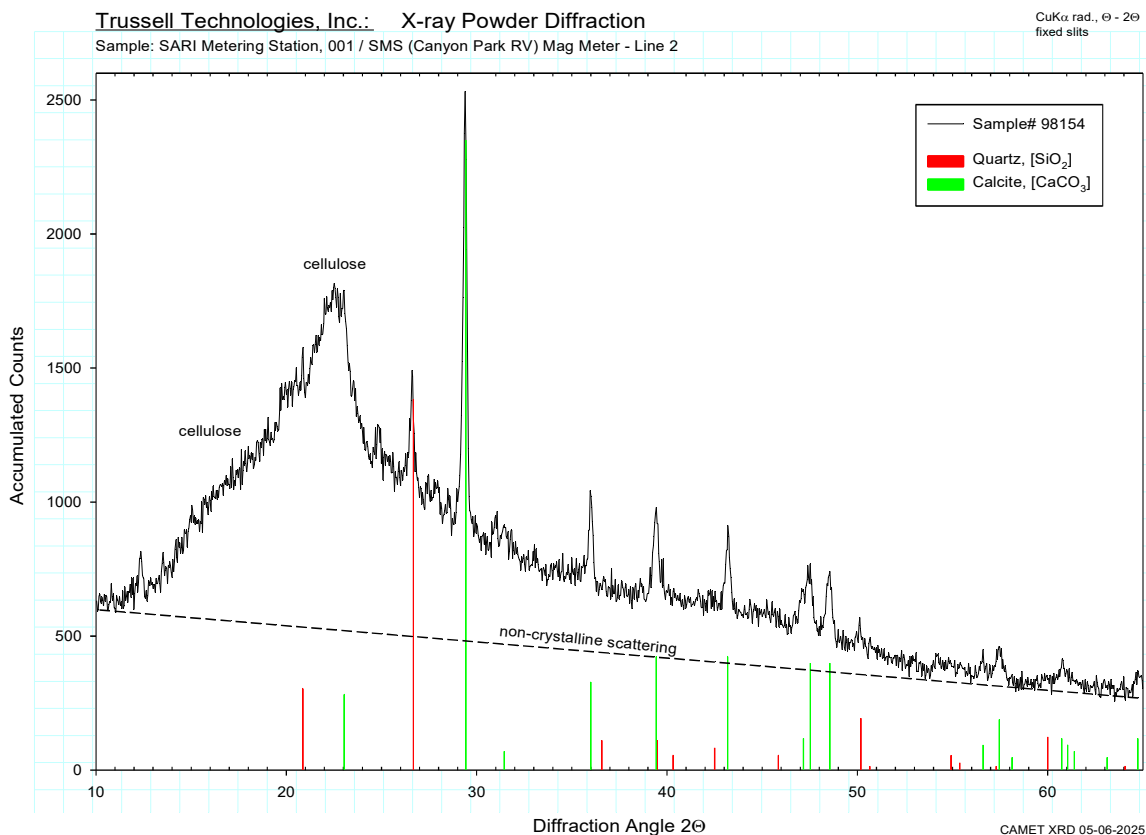
Temperature range, [°C]	98154
	Weight loss, [%]
RT – 105	6.4
105 – 175	4.9
175 – 310	30.0
310 – 550	15.1
550 – 750	6.3
750 – 950	11.2
Total LOI (RT - 950°C)	73.9
Cellulose content ¹	34.9
<u>Purge gas:</u>	
Furnace	ambient air
Balance	ambient air

¹ Combined weight loss between 105°C and 305°C.

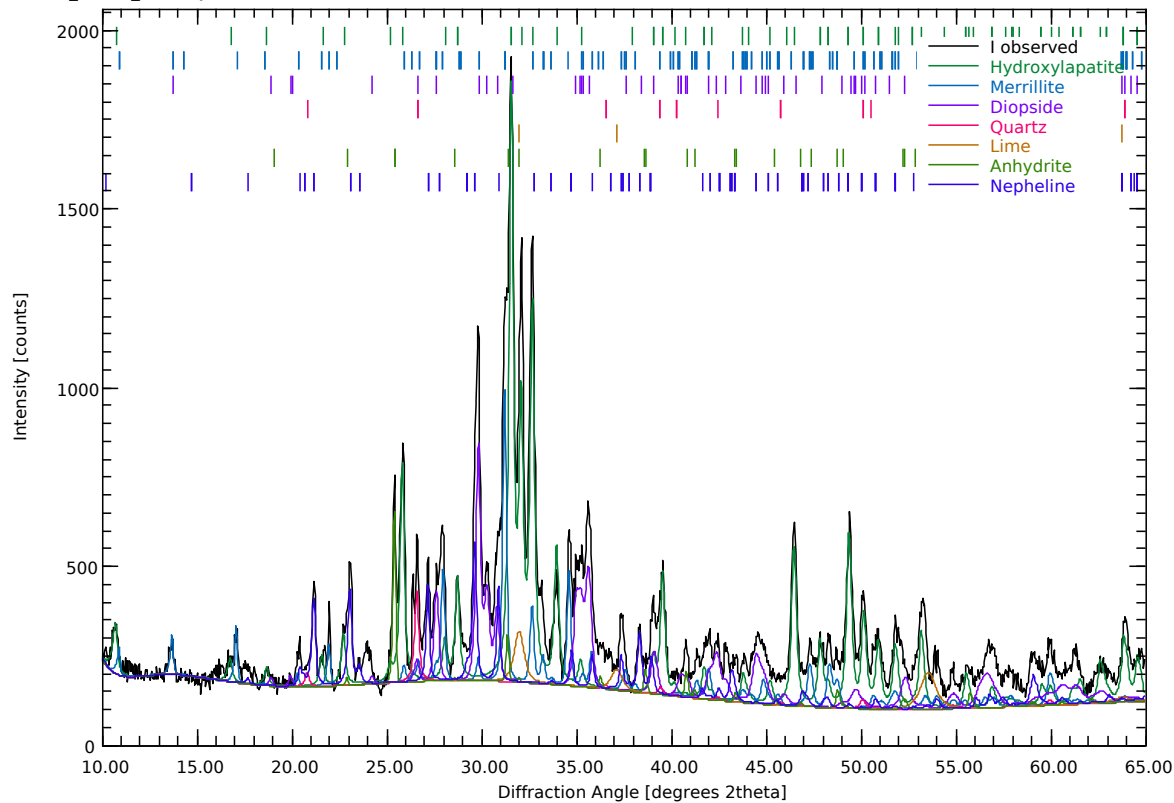
Table 4. Estimated composition of the as-received material dried at 50°C

	Sample 98154
	wt%
ACP [Ca₉(PO₄)₆]	6.2
CaCO₃	8.0
Cellulose, 105°C - 310°C	34.9
Volatiles (organic matter, bound water)	40.6
Na ₂ O	0.29
MgO	0.51
Al ₂ O ₃	1.40
SiO ₂	2.82
SO ₃	1.70
Cl	0.69
K ₂ O	0.40
TiO ₂	0.27
Cr ₂ O ₃	0.02
MnO	0.04
Fe ₂ O ₃	1.95
NiO	0.01
CuO	0.04
ZnO	0.13
As ₂ O ₃	0.00
Br	0.01
SrO	0.04

FIGURES



SAWPA_98154_950C.xy Data 1



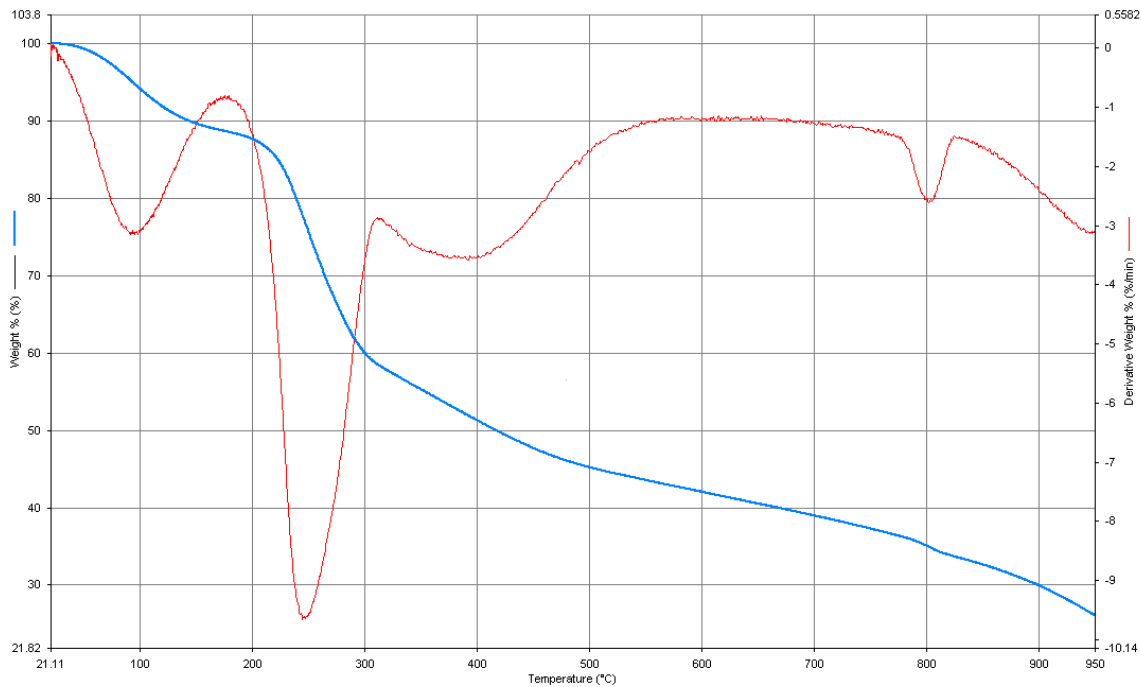


Figure 1. TGA graph of sample “SAWPA, 98154 - May 1, 2025”. As received material, dried at 50°C.
 RT to 300°C: 20°C/min
 300°C to 950°C: 40°C/min
 Balance: air Sample: air

SAWPA, 001 / SO-1 (Canyon Park RV) Mag Meter Line 2, Sample 98154

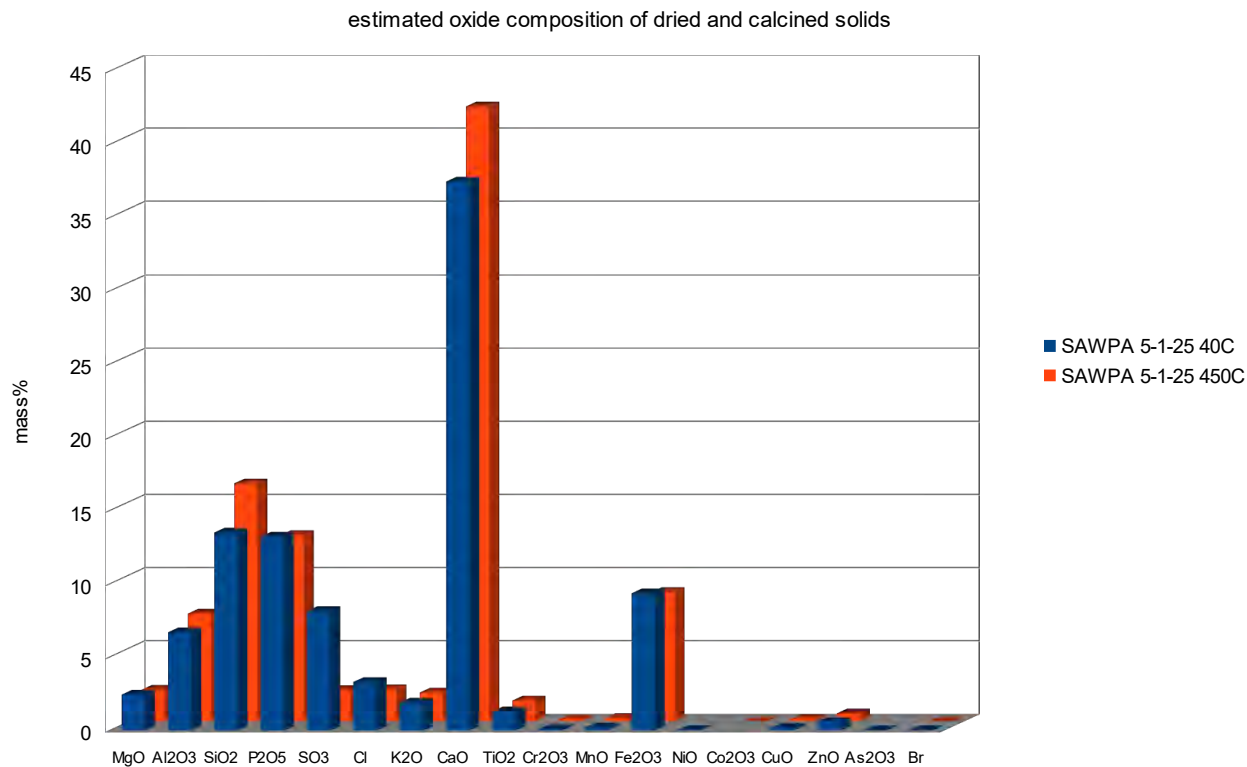
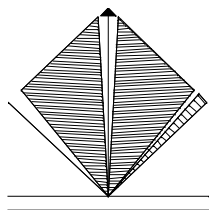


Figure 2. Estimated oxide composition of dried and calcined sample "SAWPA, 4-October-2021".



Wen Cong, Aidan Hasegawa
Trussell Technologies Inc.
1904 Franklin Street, Suite 800
Oakland, CA 94612

May 29, 2025

RE: Analysis of Waste Water Sludge, Santa Ana Watershed Project Authority (SAWPA)
PO No.: 2025-49
Report No.: 80020325

INTRODUCTION

A wet sludge sample was characterized using X-ray powder diffraction (XRD), WDXRF and thermogravimetric methods. The sample was received on May 15, 2025 and identified as follows:

Item	Description	Sample Date
(1)	SAWPA, 001 / SMS (Canyon Park RV) Mag Meter – Line 2 Sample ID: 98596	05/14/25

SAMPLING AND TESTING METHODS

The as-received sludge was dried at 50°C in air and split into representative test portions. The crystalline phase compositions of dried (at 50°C) and calcined (at 950°C) aliquots were determined by X-ray powder diffraction. XRD data sets were collected on a Rigaku wide angle powder diffractometer using CuK α radiation (8.1keV) and a diffracted beam monochromator. The results are listed in Table 1 and illustrated in Figures 1 and 2.

Elemental compositions were estimated for test portions dried at 50°C and calcined at 450°C using a standard-less method and datasets collected on a Rigaku ZSX Priums IV WDXRF spectrometer. Elemental results are listed in Table 2 and illustrated in Figure 4. The estimated composition of the dried sludge material is listed in Table 4.

Thermogravimetric analysis (TGA) was performed using a Perkin Elmer TGA 7 with a high temperature furnace in ambient air atmosphere. The results are listed in Table 3 and illustrated in Figure 3.

RESULTS

The sludge material consists of the cellulose portion, calcite and quartz, and non-crystalline phosphates, sulfates, silicates, alkalies and ferrous compounds. The non-crystalline fractions crystallize as various phosphate and silicate phases during calcination at 950°C

Please let us know if you have any questions regarding these results,

TABLES

Table 1. Normalized mineral composition of sample #98596, May 14, 2025

Mineral Name / Chemical Formula	Calcined at 950°C	Dried at 50°C
	wt%	wt%
Hydroxyapatite, $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$	23.9	
Merillite, $\text{Ca}_9\text{NaMg}(\text{PO}_4)_7$	28.5	
Diopside, $\text{CaMgSi}_2\text{O}_6$	30.3	
Lime, CaO	1.1	
Anhydrite, CaSO_4	Not observed	
Nepheline, $(\text{Na,K})\text{AlSiO}_4$	11.3	
Archerite, $(\text{K,NH}_4)\text{H}_2\text{PO}_4$	2.2	
Not Identified	< 5	<5
Calcite, CaCO_3		observed
Quartz, SiO_2	2.7	observed

Table 2. Normalized and corrected oxide composition of the dried and calcined sludge material

Oxides / Elements	98596, dried at 50°C	98596, dried at 50°C corrected for LOI	98596, calcined at 450°C
	wt%	wt%	wt%
Na_2O	2.27	0.52	1.93
MgO	1.74	0.4	1.92
Al_2O_3	6.66	1.54	6.98
SiO_2	15.72	3.63	16.20
P_2O_5	12.95	2.99	12.75
SO_3	6.97	1.61	3.53
Cl	4.05	0.94	2.10
K_2O	2.77	0.64	2.44
CaO	32.77	7.57	35.64
TiO_2	2.2	0.51	2.48
Cr_2O_3	0.17	0.04	0.16
MnO	0.26	0.06	0.36
Fe_2O_3	10.15	2.34	11.91
NiO	0.04	0.01	
CuO	0.2	0.05	0.25
ZnO	0.52	0.12	0.53
As_2O_3	0.02	0	0.04
Br	0.04	0.01	
SrO	0.17	0.04	0.12
ZrO_2		0	0.00
BaO	0.33	0.08	0.65
LOI at 450°C		76.89	76.89
Total	100	100	100

Table 3. Weight loss data as determined by TGA.

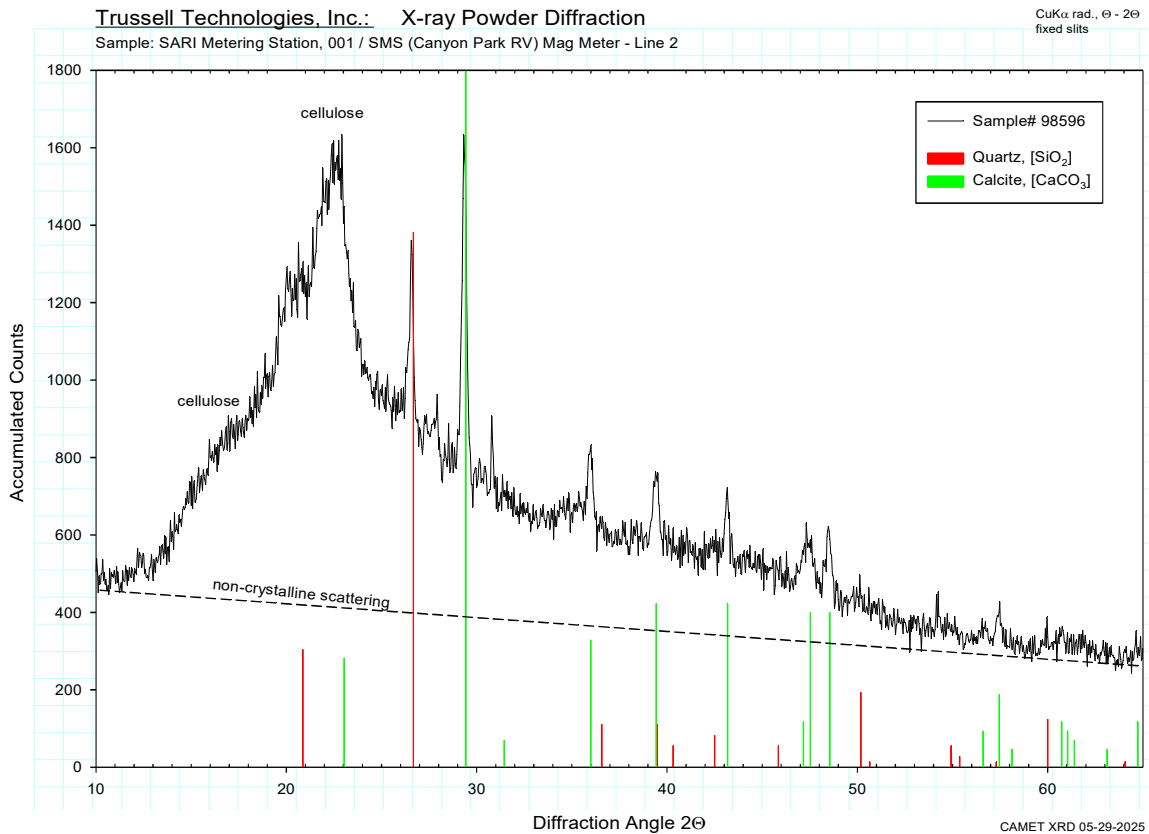
Temperature range, [°C]	98596
	Weight loss, [%]
RT – 105	5.7
105 – 175	5.1
175 – 325	32.7
325 – 550	15.6
550 – 750	5.2
750 – 950	7.4
Total LOI (RT - 950°C)	71.8
Cellulose content ¹	37.9
<u>Purge gas:</u>	
Furnace	ambient air
Balance	ambient air

¹ Combined weight loss between 105°C and 325°C.

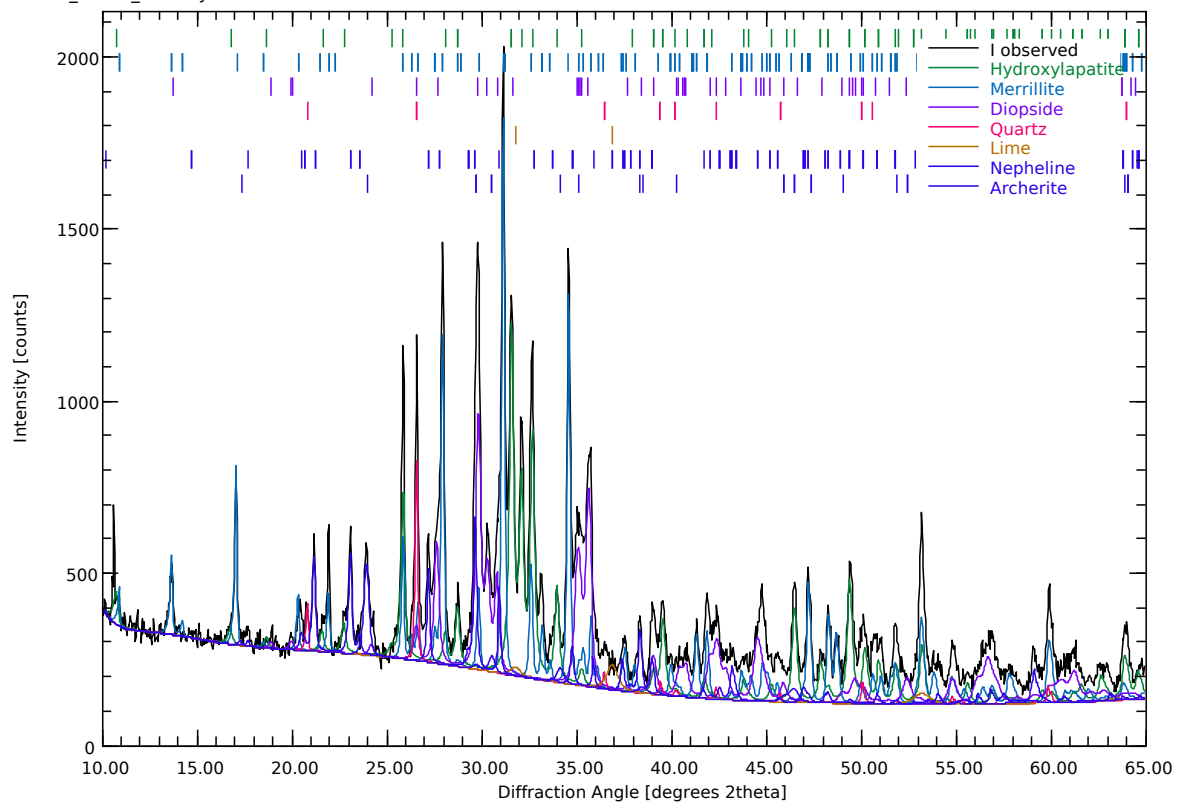
Table 4. Estimated composition of the as-received material dried at 50°C

	Sample 98596
	wt%
ACP [Ca₉(PO₄)₆]	5.8
CaCO₃	6.3
Cellulose, 105°C - 310°C	37.9
Volatiles (organic matter, bound water)	39.0
Na ₂ O	0.46
MgO	0.35
Al ₂ O ₃	1.35
SiO ₂	3.20
SO ₃	1.42
Cl	0.82
K ₂ O	0.56
TiO ₂	0.45
Cr ₂ O ₃	0.03
MnO	0.05
Fe ₂ O ₃	2.06
NiO	0.01
CuO	0.04
ZnO	0.11
As ₂ O ₃	0.00
Br	0.01
SrO	0.04
ZrO ₂	0.00
BaO	0.07

FIGURES



SAWPA_98596_950C.xy Data 1



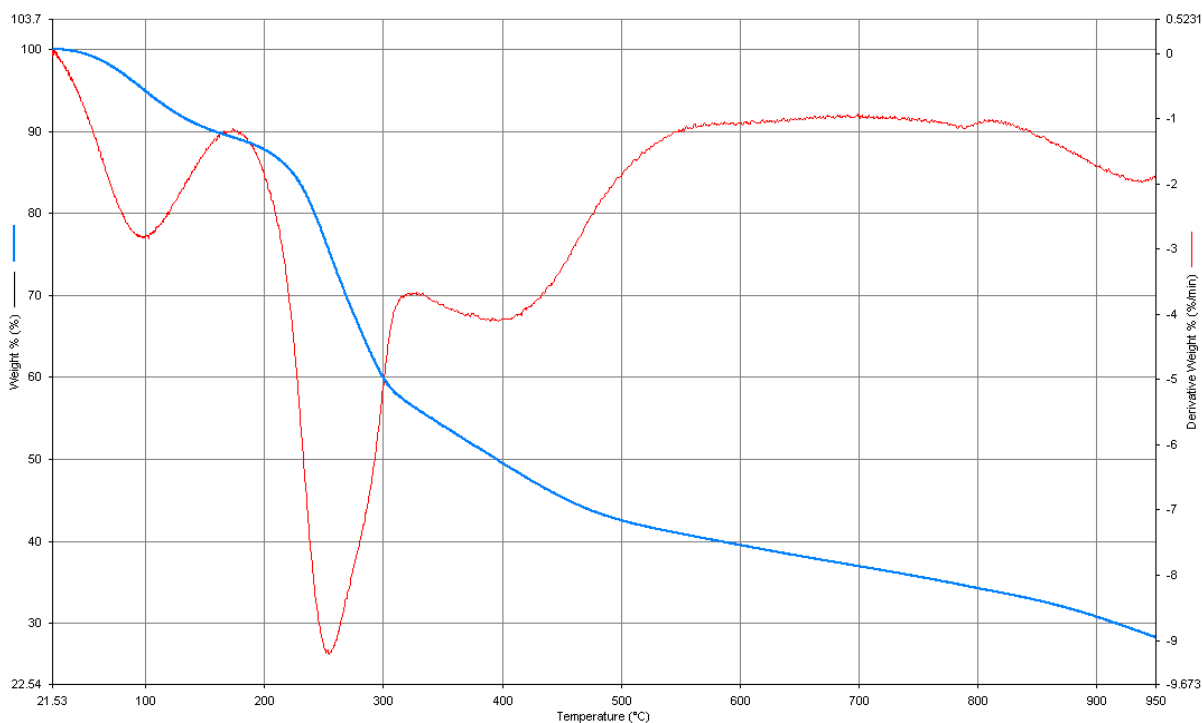


Figure 1. TGA graph of sample “SAWPA, 98596 - May 14, 2025”. As received material, dried at 50°C.
 RT to 300°C: 20°C/min
 300°C to 950°C: 40°C/min
 Balance: air Sample: air

SAWPA, 001 / SO-1 (Canyon Park RV) Mag Meter Line 2, Sample 98596

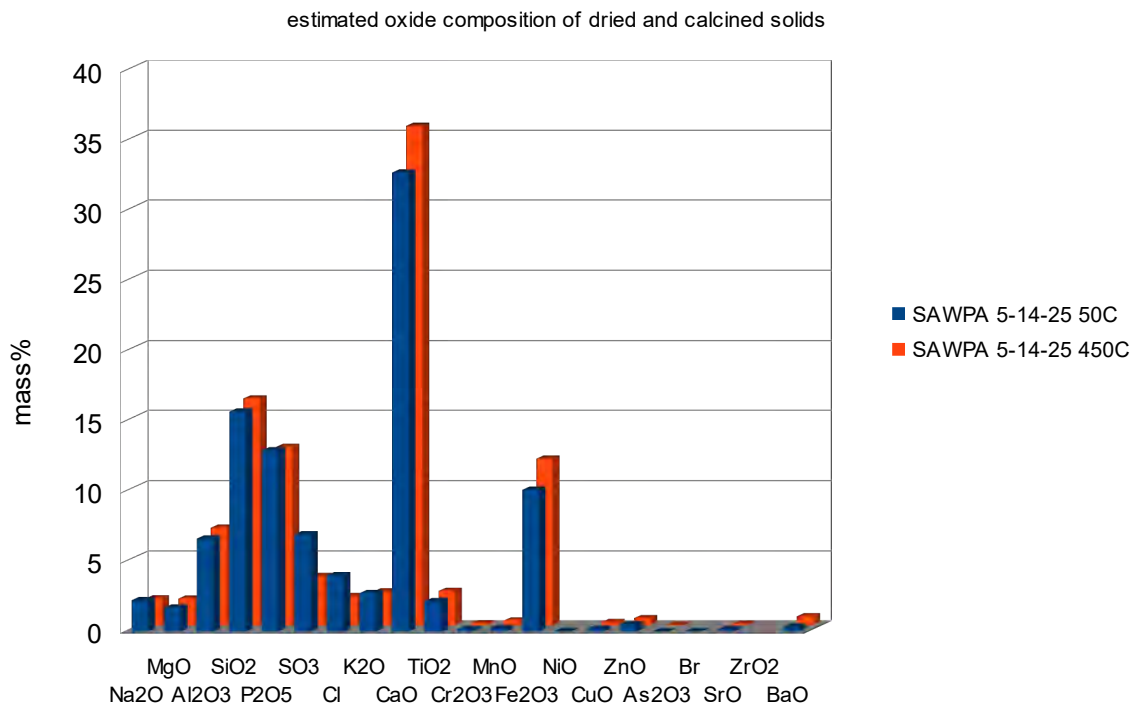
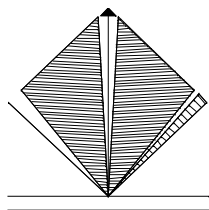


Figure 2. Estimated oxide composition of dried and calcined sample "SAWPA, 98596 - May 14, 2025".

**Wen Cong, Aidan Hasegawa**

June 12, 2025

Trussell Technologies Inc.

224 N Fair Oaks Ave

Pasadena, CA 91103

RE: Analysis of Waste Water Sludge, Santa Ana Watershed Project Authority (SAWPA)

PO No.: 2025-49

Report No.: 80020425

INTRODUCTION

A wet sludge sample was characterized using X-ray powder diffraction (XRD), WDXRF and thermogravimetric methods. The sample was received on May 30, 2025 and identified as follows:

Item	Description	Sample Date
(1)	SAWPA, 001 / SMS (Canyon Park RV) Mag Meter – Line 2 Sample ID: 98848	05/28/25

SAMPLING AND TESTING METHODS

The as-received sludge was dried at 50°C in air and split into representative test portions. The crystalline phase compositions of dried (at 50°C) and calcined (at 950°C) aliquots were determined by X-ray powder diffraction. XRD data sets were collected on a Rigaku wide angle powder diffractometer using CuK α radiation (8.1keV) and a diffracted beam monochromator. The results are listed in Table 1 and illustrated in Figures 1 and 2.

Elemental compositions were estimated for test portions dried at 50°C and calcined at 450°C using a standard-less method and datasets collected on a Rigaku ZSX Priums IV WDXRF spectrometer. Elemental results are listed in Table 2 and illustrated in Figure 4. The estimated composition of the dried sludge material is listed in Table 4.

Thermogravimetric analysis (TGA) was performed using a Perkin Elmer TGA 7 with a high temperature furnace in ambient air atmosphere. The results are listed in Table 3 and illustrated in Figure 3.

RESULTS

The sludge material consists of the cellulose portion, calcite and quartz, and non-crystalline phosphates, sulfates, silicates, alkalies and ferrous compounds. The non-crystalline fractions crystallize as various phosphate and silicate phases during calcination at 950°C

Please let us know if you have any questions regarding these results,

TABLES

Table 1. Normalized mineral composition of sample #98848, May 28, 2025

Mineral Name / Chemical Formula	Calcined at 950°C	Dried at 50°C
	wt%	wt%
Hydroxyapatite, $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$	39.5	
Merillite, $\text{Ca}_9\text{NaMg}(\text{PO}_4)_7$	5.2	
Diopside, $\text{CaMgSi}_2\text{O}_6$	29.6	
Lime, CaO	1.6	
Anhydrite, CaSO_4	1.3	
Nepheline, $(\text{Na,K})\text{AlSiO}_4$	13.3	
Archerite, $(\text{K,NH}_4)\text{H}_2\text{PO}_4$	4.5	
Hematite, Fe_2O_3	3.2	
Not Identified		<5
Calcite, CaCO_3		observed
Quartz, SiO_2	1.8	observed

Table 2. Normalized and corrected oxide composition of the dried and calcined sludge material

Oxides / Elements	98848, dried at 50°C	98848, dried at 50°C corrected for LOI	98848, calcined at 450°C
	wt%	wt%	wt%
Na_2O	1.36	0.33	1.90
MgO	3.43	0.84	2.01
Al_2O_3	4.77	1.17	5.30
SiO_2	12.66	3.09	13.80
P_2O_5	11.34	2.77	9.88
SO_3	8.45	2.06	3.51
Cl	2.76	0.67	2.29
K_2O	1.55	0.38	2.19
CaO	40.12	9.80	41.43
TiO_2	4.17	1.02	5.29
Cr_2O_3	0.20	0.05	0.24
MnO	0.28	0.07	0.39
Fe_2O_3	8.16	1.99	10.77
NiO	0.04	0.01	0.06
CuO	0.21	0.05	0.28
ZnO	0.33	0.08	0.49
As_2O_3	0.02	0.01	
Br	0.03	0.01	
SrO	0.12	0.03	0.16
LOI at 450°C		75.57	75.57
Total	100.00	100.00	100.00

Table 3. Weight loss data as determined by TGA.

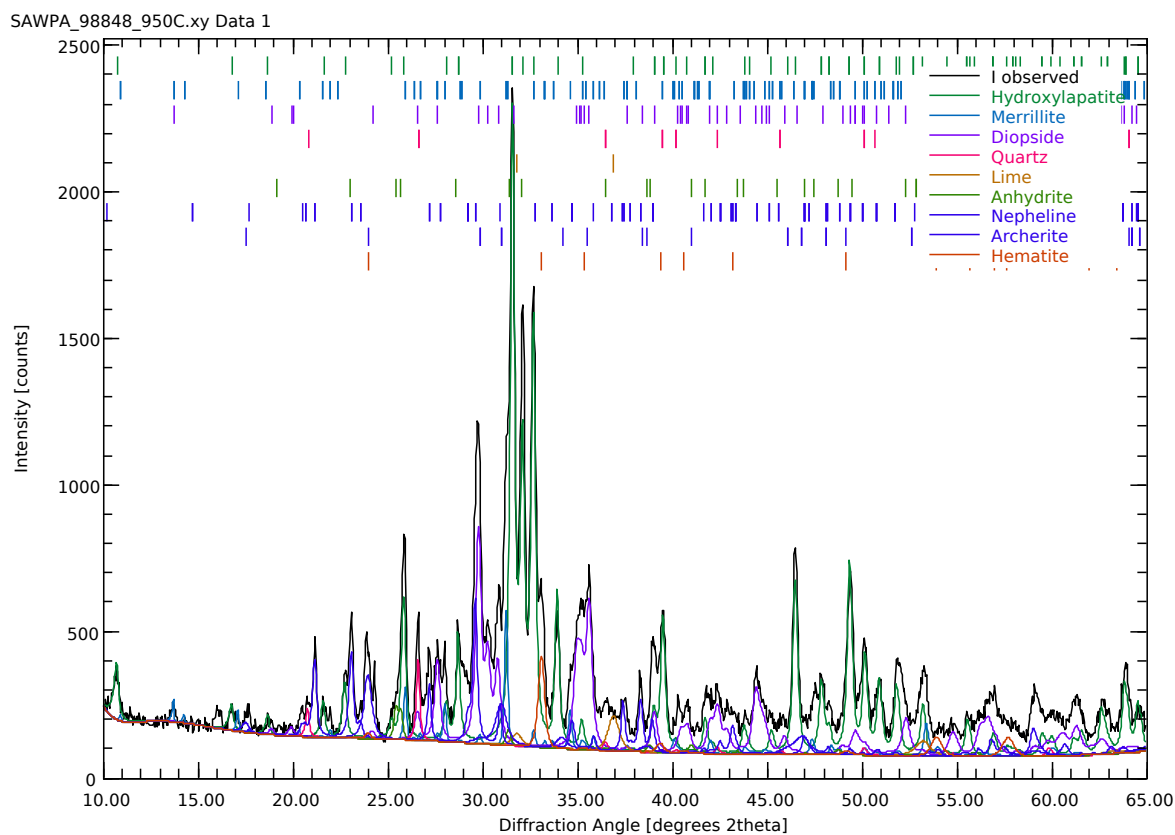
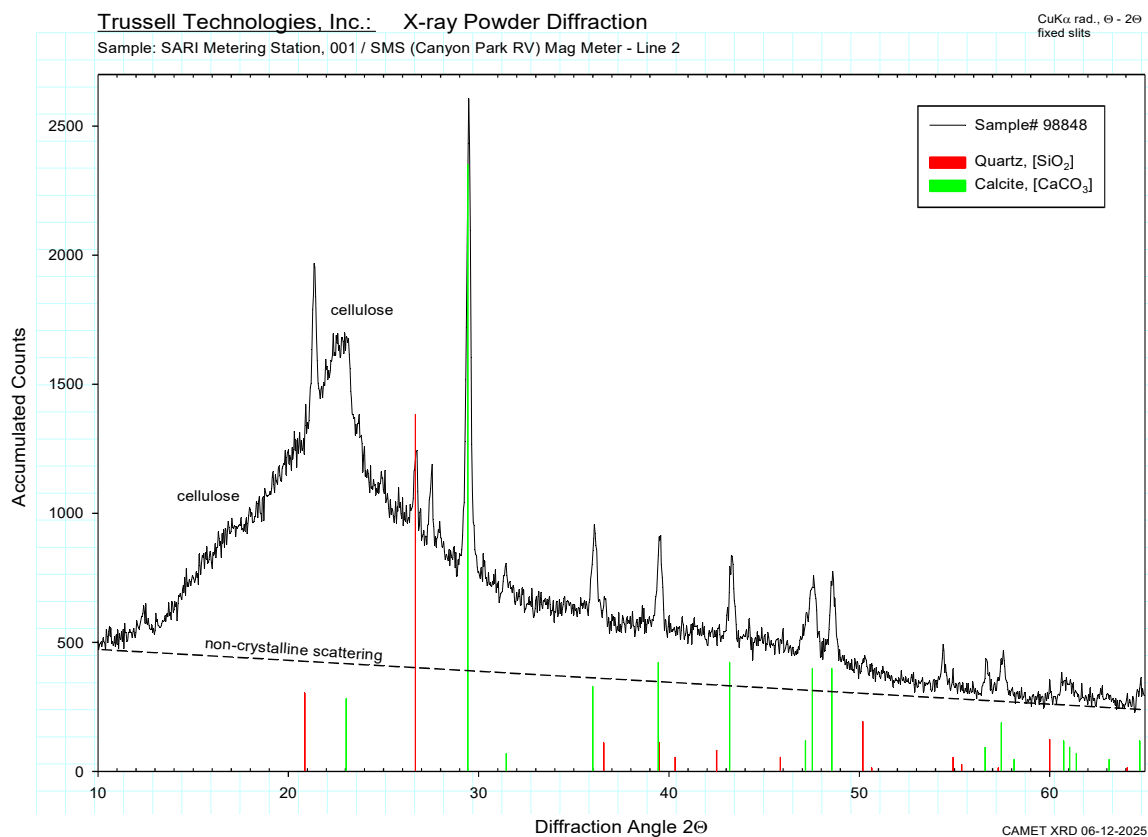
Temperature range, [°C]	98848
	Weight loss, [%]
RT – 105	7.4
105 – 165	4.0
165 – 310	33.1
310 – 550	14.2
550 – 750	6.8
750 – 950	9.5
Total LOI (RT - 950°C)	75.0
Cellulose content ¹	37.1
<u>Purge gas:</u>	
Furnace	ambient air
Balance	ambient air

¹ Combined weight loss between 105°C and 310°C.

Table 4. Estimated composition of the as-received material dried at 50°C

	Sample 98848
	wt%
ACP [Ca₉(PO₄)₆]	5.0
CaCO₃	9.6
Cellulose, 105°C - 310°C	37.1
Volatiles (organic matter, bound water)	38.5
Na ₂ O	0.27
MgO	0.69
Al ₂ O ₃	0.96
SiO ₂	2.56
SO ₃	1.71
Cl	0.56
K ₂ O	0.31
TiO ₂	0.84
Cr ₂ O ₃	0.04
MnO	0.06
Fe ₂ O ₃	1.65
NiO	0.01
CuO	0.04
ZnO	0.07
As ₂ O ₃	0.00
Br	0.01
SrO	0.03

FIGURES



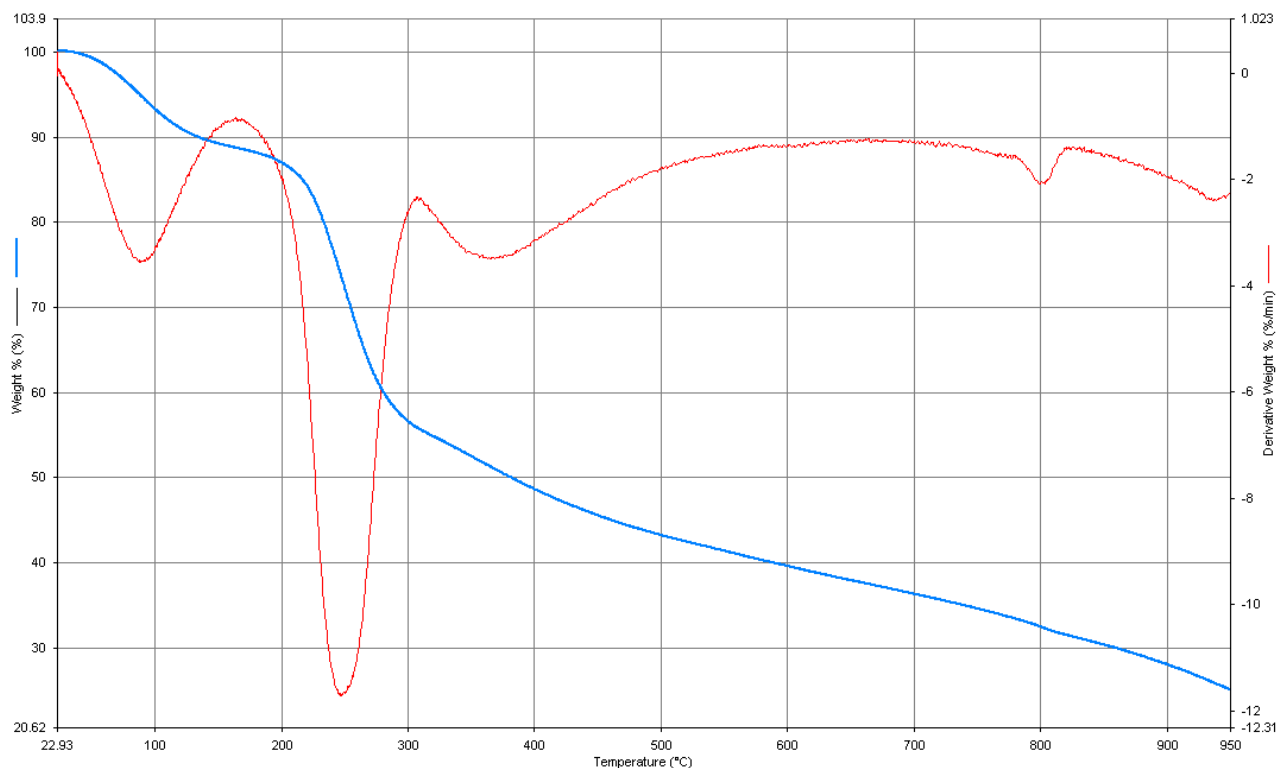


Figure 1. TGA graph of sample “SAWPA, 98848 - May 28, 2025”. As received material, dried at 50°C.
 RT to 300°C: 20°C/min
 300°C to 950°C: 40°C/min
 Balance: air Sample: air

SAWPA, 001 / SO-1 (Canyon Park RV) Mag Meter Line 2, Sample 98848

estimated oxide composition of dried and calcined solids

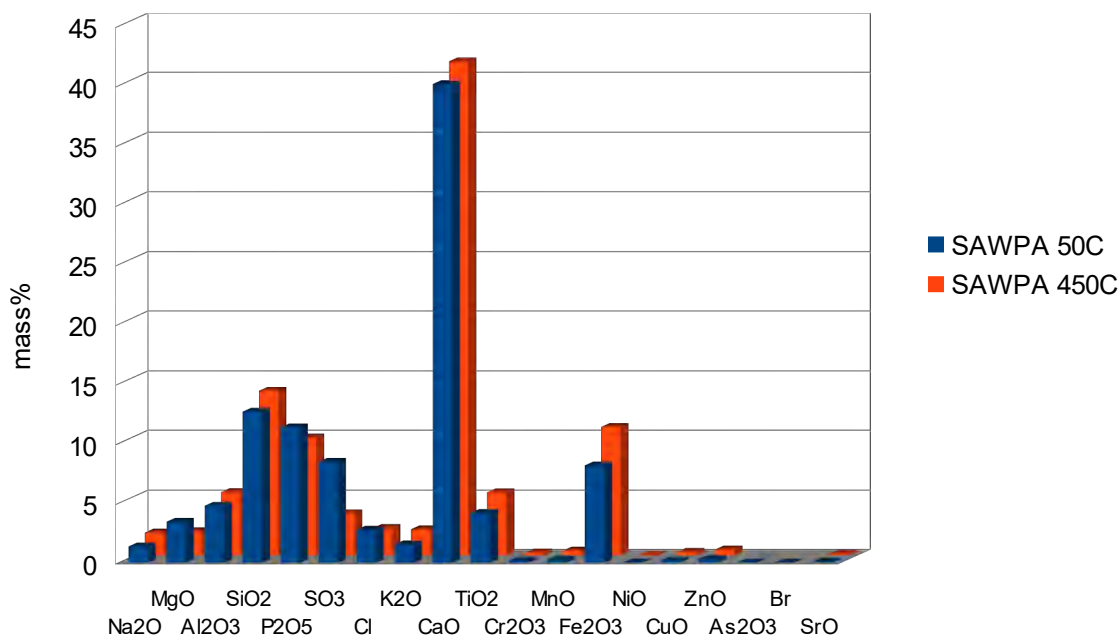


Figure 2. Estimated oxide composition of dried and calcined sample "SAWPA, 98848 - May 28, 2025".



13 Appendix E – Babcock Laboratories Results for the Three Solids Characterization Events

Parameter	Units	Sample Date		
		5/1/25	5/14/25	5/29/25
TSS	mg/L	140	96	110
TSS	mg/L	130	110	110
TSS	mg/L	160	100	120
VSS	mg/L	110	80	64
VSS	mg/L	100	94	69
VSS	mg/L	130	83	78
BOD ₅	mg/L	42	48	26
BOD ₅	mg/L	52	50	26
BOD ₅	mg/L	45	59	28
Dissolved BOD ₅	mg/L	ND	7	ND
Alkalinity	mg/L as CaCO ₃	1,100	1,000	1,000
Dissolved Alkalinity	mg/L as CaCO ₃	1,000	1,000	970
Bicarbonate	mg/L as CaCO ₃	1,100	1,000	1,000
Dissolved Bicarbonate	mg/L as CaCO ₃	1,000	1,000	970
Calcium	mg/L	650	710	660
Dissolved Calcium	mg/L	650	690	710
TDS	mg/L	5,000	5,400	5,000
Orthophosphate	mg/L	0.65	0.67	1.0
DOC	mg/L	11	12	10
pH	--	7.24	7.32	7.25
Temperature	°C	23.6	24.0	24.2
Electroconductivity	µS/cm	7.65	6.26	5.55

Page Intentionally Blank

**Santa Ana Watershed Project Authority
PA24 - Brine Line - Financial Report
September 2025**

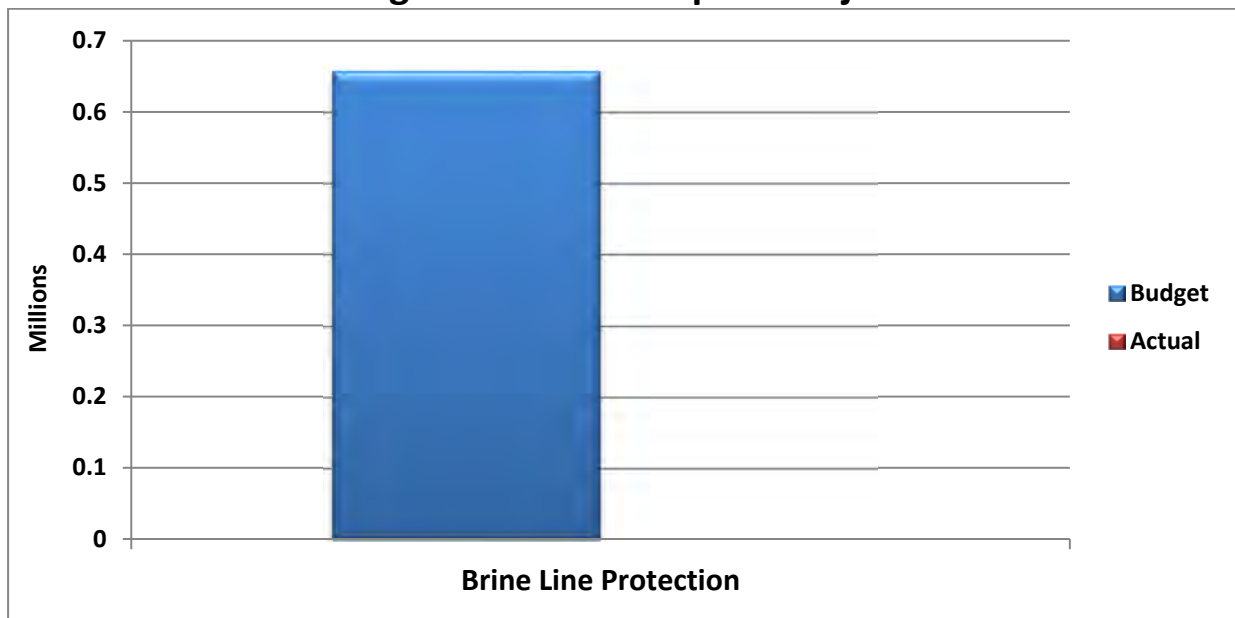
Staff comments provided on the last page are an integral part of this report.

Overview	This report highlights the Brine Line's key financial indicators for the Fiscal Year-to-Date (FYTD) through September 2025 unless otherwise noted.
----------	--

Brine Line - Capital Projects

Budget to Actual – Capital Projects 				Favorable
	Annual Budget	FYTD Budget	FYTD Actual	Favorable (Unfavorable) Variance
Brine Line Protection	\$2,632,558	\$658,140	\$-	\$658,140
Total Capital Costs	\$2,632,558	\$658,140	\$-	\$658,140

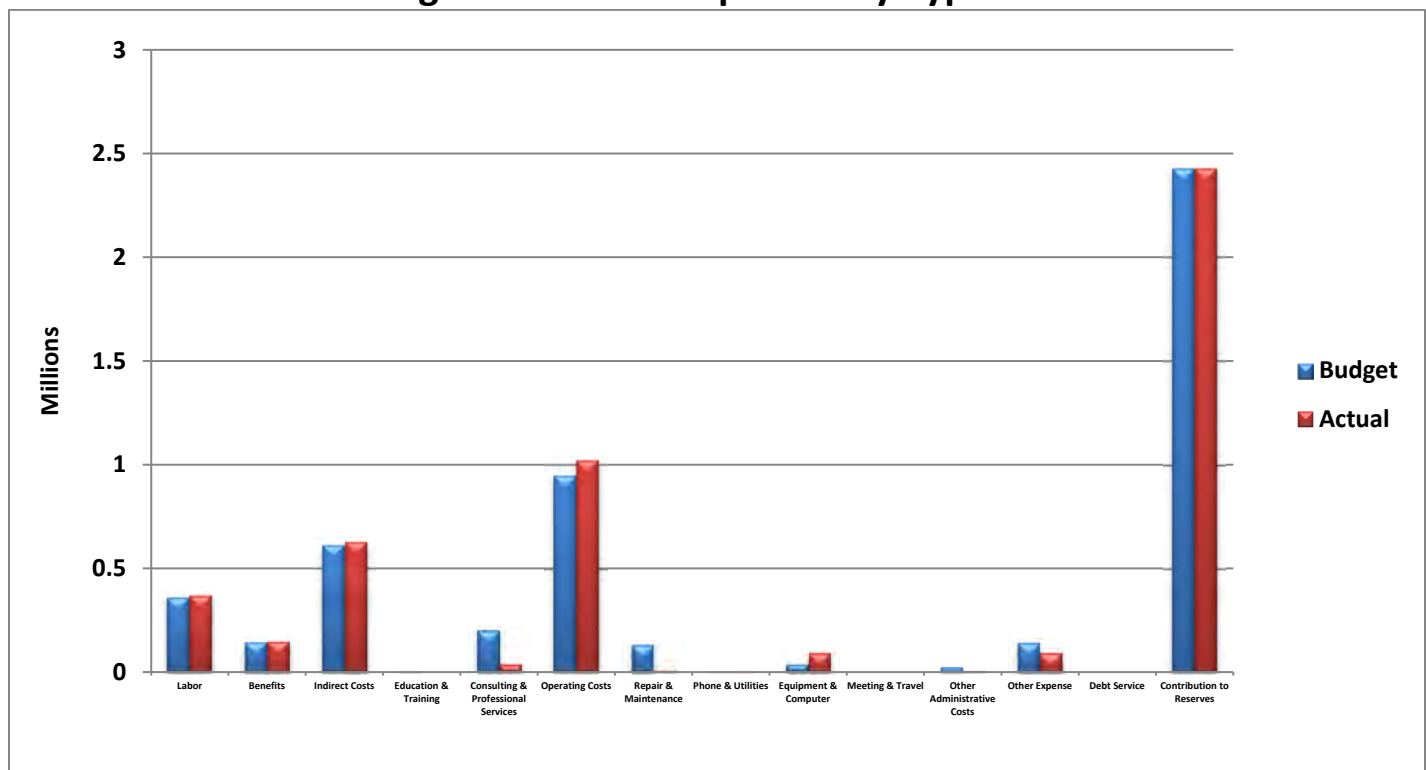
Budget to Actual - Capital Projects



Brine Line – Operating

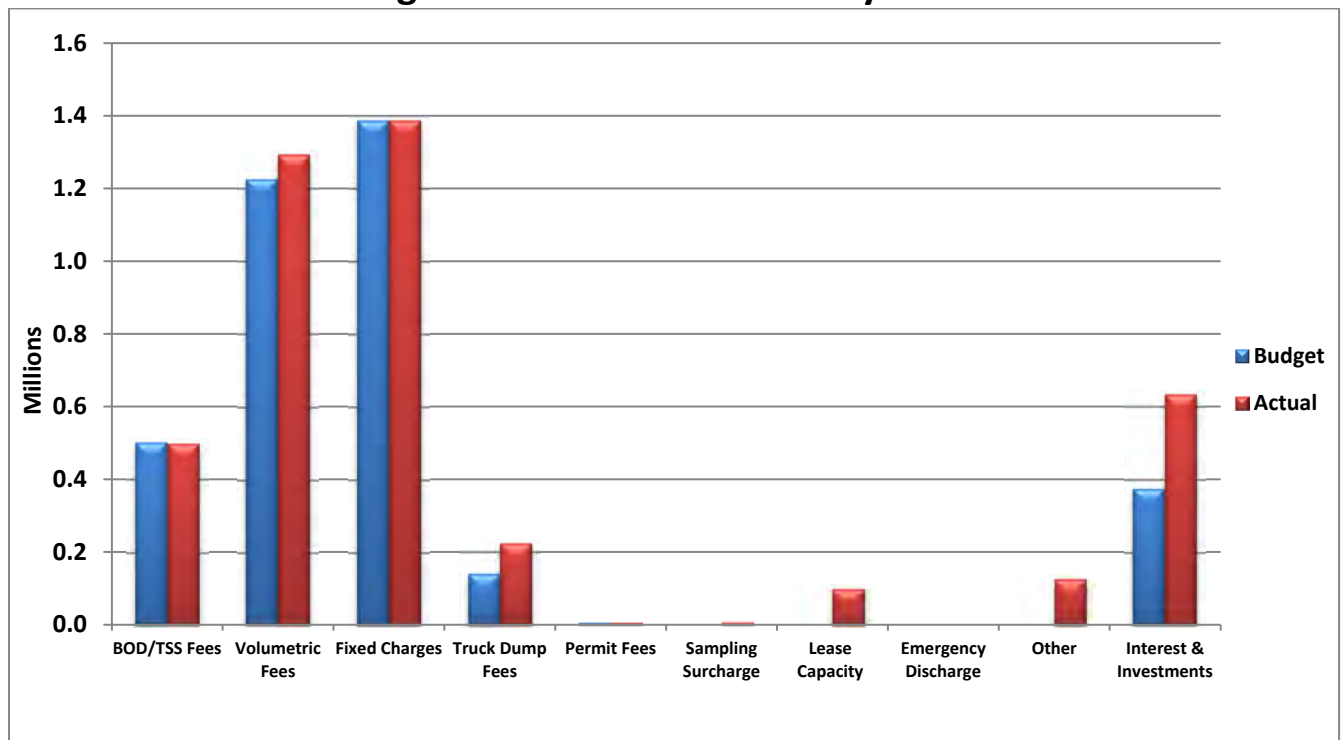
Budget to Actual - Expenses by Type				 Favorable
	Annual Budget	FYTD Budget	FYTD Actual	Favorable (Unfavorable) Variance
Labor	\$1,434,775	\$358,694	\$368,453	(\$9,759)
Benefits	577,649	144,412	148,486	(4,074)
Indirect Costs	2,438,925	609,731	626,369	(16,638)
Education & Training	14,500	3,625	265	3,360
Consulting & Prof Svcs	810,000	202,500	38,969	163,531
Operating Costs	3,785,480	946,370	1,020,323	(73,953)
Repair & Maintenance	518,000	129,500	10,021	119,479
Phone & Utilities	11,000	2,750	2,805	(55)
Equip & Computers	160,706	40,177	91,691	(51,514)
Meeting & Travel	3,000	750	-	750
Other Admin Costs	82,050	20,513	5,803	14,710
Other Expense	566,680	141,670	91,482	50,188
Debt Service	1,709,476	-	-	-
Contribution to Reserves	2,426,224	2,426,224	2,426,224	-
Total	\$14,538,465	\$5,026,916	\$4,830,891	\$196,025

Budget to Actual - Expenses by Type

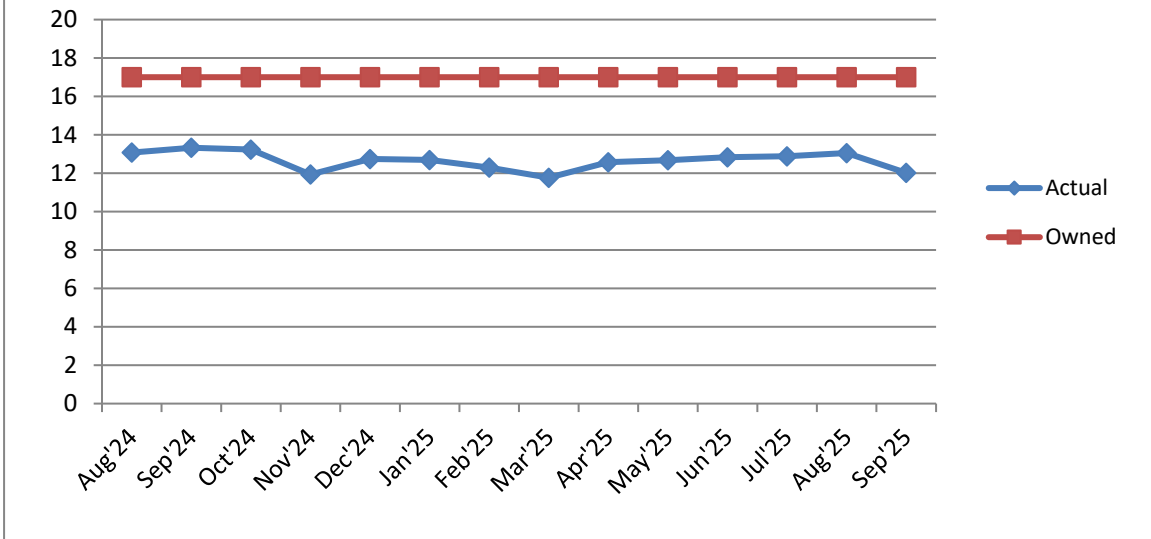


Budget to Actual - Revenues by Source				Favorable
	Annual Budget	FYTD Budget	FYTD Actual	Favorable (Unfavorable) Variance
BOD/TSS Fees	\$2,002,800	\$500,700	\$497,633	(\$3,067)
Volumetric Fees	4,901,220	1,225,305	1,293,364	68,059
Fixed Charges	5,546,045	1,386,511	1,386,511	-
Truck Dump Fees	559,600	139,900	222,996	83,096
Permit Fees	28,800	6,500	6,500	-
Sampling Surcharge	-	-	7,661	7,661
Lease Capacity Revenue	-	-	98,568	98,568
Emergency Discharge Fees	-	-	-	-
Other Revenue	-	-	125,100	125,100
Interest & Investments	1,500,000	375,001	633,352	258,351
Total	\$14,538,465	\$3,633,917	\$4,271,685	\$637,768

Budget to Actual - Revenues by Source



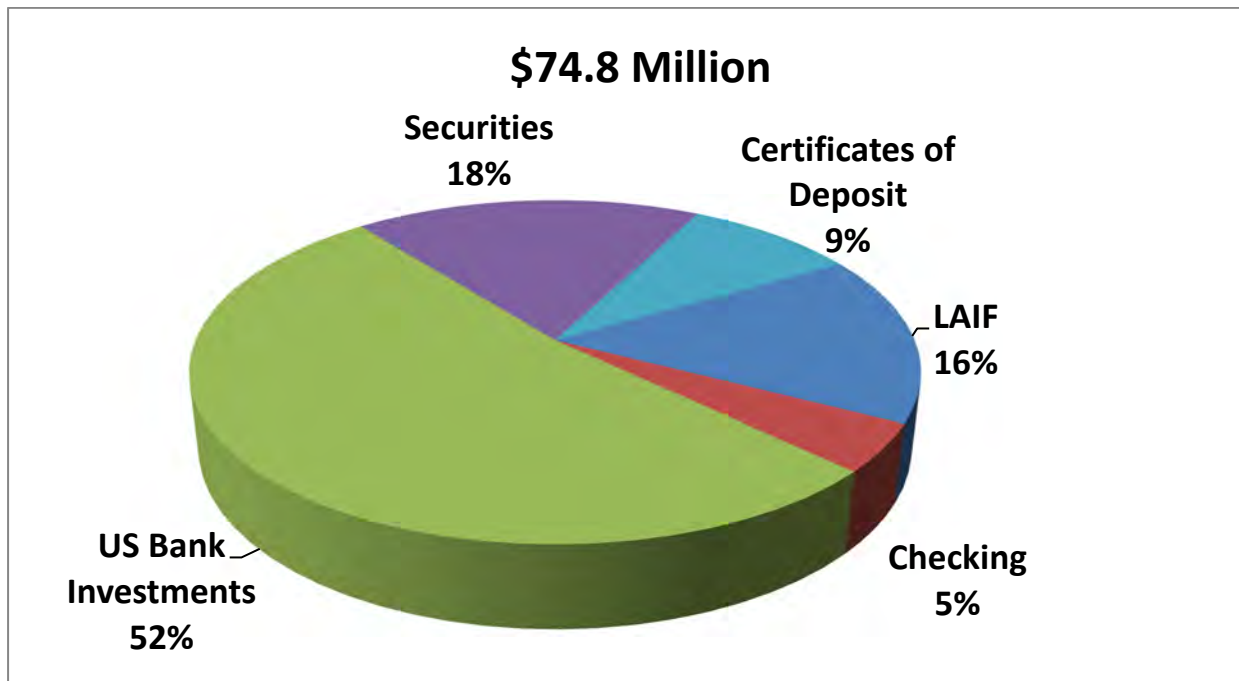
Average Daily Flow by Month



Total Discharge by Agency (in million gallons)

Discharger	Jul'25	Aug'25	Sep'25	Oct'25	Nov'25	Dec'25	Total
Chino Desalter Authority	108.2149	95.1080	102.5528				305.8757
Eastern Municipal Water District	111.5109	107.8592	116.6136				335.9837
Inland Empire Utilities Agency	14.1188	12.1280	12.8991				39.1459
San Bernardino Valley MWD	43.0155	41.9926	45.5162				130.5243
Western Municipal Water District	118.5799	107.6741	115.3745				341.6285
SAWPA Adjustment	0.0000	0.0000	0.0000				0.0000
Truck Discharge	3.7846	3.4274	3.6655				10.8775
Total	399.2246	368.1893	396.6217				1,164.0356

Total Cash & Investments



Reserve Fund Balance

	Amount
Debt Retirement	\$3,142,328
Pipeline Replacement & Capital Investment	44,064,551
OC San Pipeline Rehabilitation	3,593,976
Pipeline Capacity Management	13,363,704
OC San Future Treatment & Disposal Capacity	2,046,026
YVWD Treatment Purchase	4,569,152
Brine Line Operating	2,548,941
Brine Line Operating Cash	1,493,147
Total Reserves	\$74,821,825

Legend

<u>Compared to Budget</u>		
	Ahead or Favorable	Above +5% Favorable Revenue or Expense Variance
	On Track	+5% to -2% Variance
	Behind	-3% to -5% Variance
	Concern	Below -5% Variance

Staff Comments

For this month's report, the item(s) explained below are either "behind", a "concern", or have changed significantly from the prior month.

Capital Projects are 100% below budget. Operating Expenses are 3.9% below budget and Revenues are 17.6% above budget.



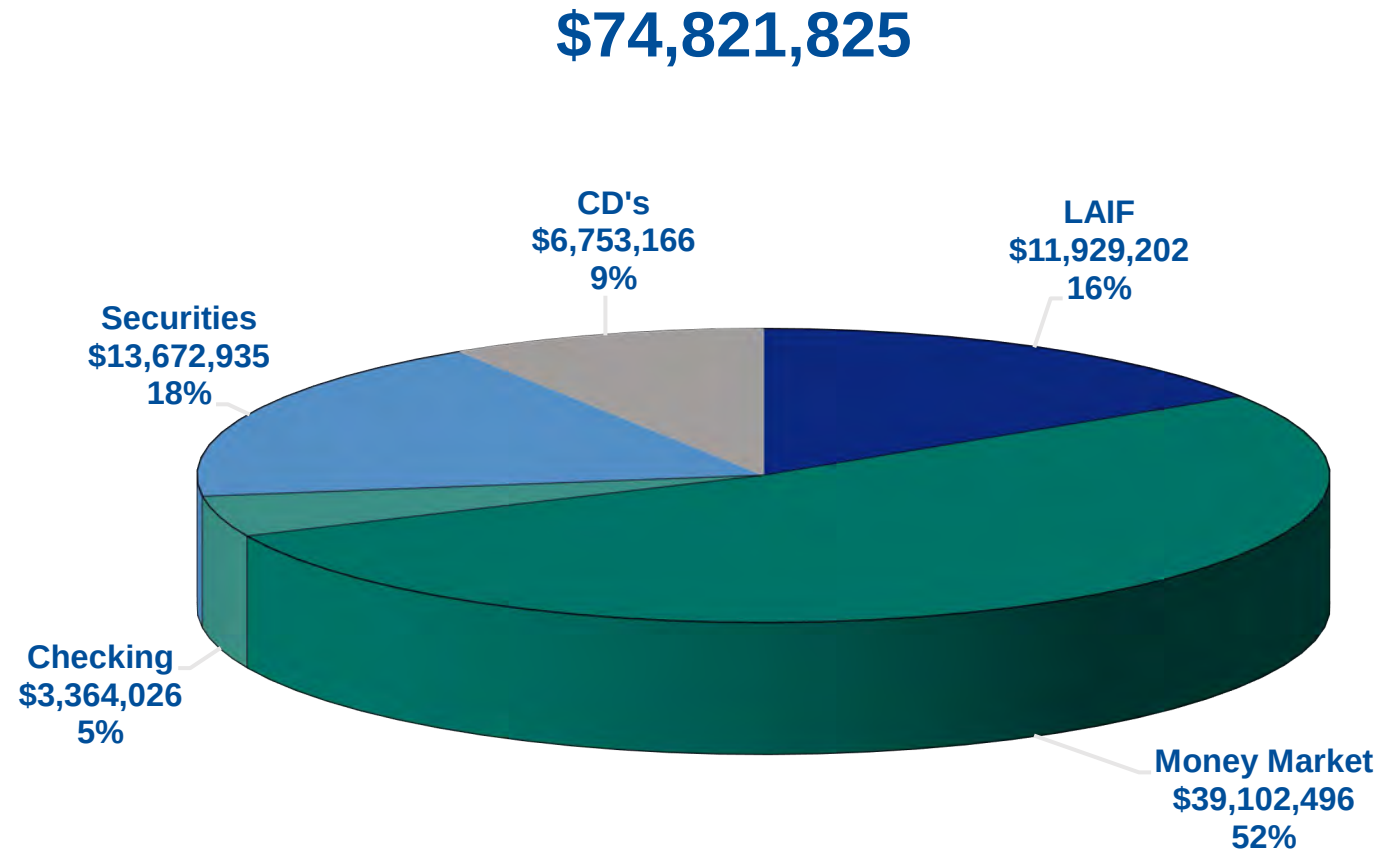
SANTA ANA WATERSHED
PROJECT AUTHORITY

Financial Report for the Inland Empire Brine Line Enterprise/CIP for the 1st Quarter Ending September 30, 2025

Agenda

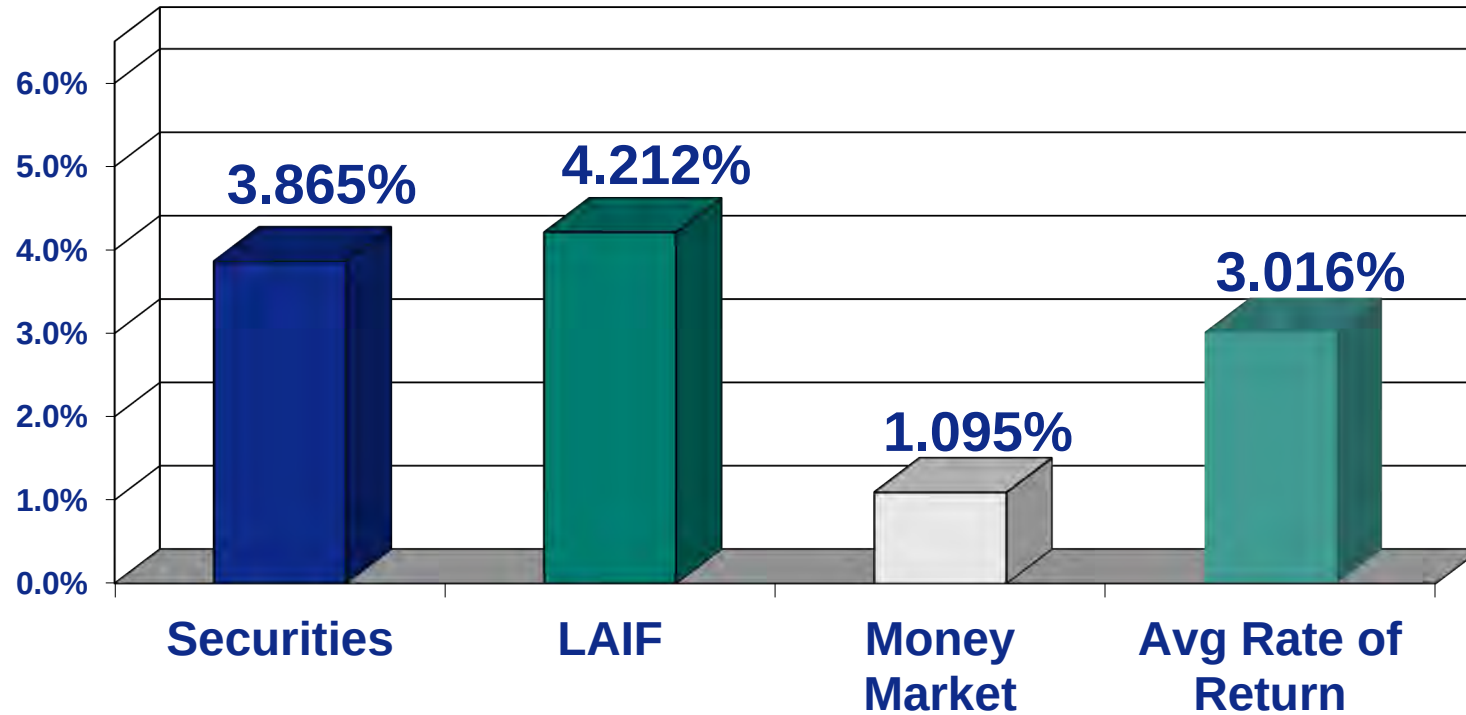
- Cash & Investments
- Reserve Account Balances
- Transfer, Uses, and Contributions from/to Reserves
- Enterprise Revenues
- Enterprise Expenses
- Enterprise Performance
- Capital Improvement Program

Cash & Investments



Cash & Investments

Interest Rate Analysis



Reserve Account Balance

Reserve Account	Balance
Debt Retirement	\$3,142,328
Pipeline Replacement & Capital Investment	44,064,551
OC San Pipeline Rehabilitation	3,593,976
Pipeline Capacity Management	13,363,704
OC San Future Treatment & Disposal Capacity	2,046,026
YVWD Treatment Purchase	4,569,152
Brine Line Operating	2,548,941
Operating Cash	1,493,147
Total Reserves	\$74,821,825

Reserve Account Balance

Reserve	Balance @ 12/31/2024	Balance @ 03/31/2025	Balance @ 06/30/2025	Balance @ 09/30/2025
Debt Retirement	\$3,043,856	\$3,077,423	\$3,108,588	\$3,142,328
Pipeline Replacement & Capital Investment	37,229,471	37,634,865	38,176,630	44,064,551
OC San Pipeline Rehabilitation	3,068,481	3,102,321	3,133,738	3,593,976
Pipeline Capacity Mgmt	12,944,921	13,087,674	13,220,214	13,363,704
OC San Future Treatment & Disposal Capacity	1,981,909	2,003,765	2,024,057	2,046,026
YVWD Treatment Purchase	0	4,485,897	4,520,062	4,569,152
Brine Line Operating	2,312,437	2,337,938	2,361,615	2,548,941
Operating Cash	4,367,742	5,740,510	6,589,393	1,493,147
Total	\$64,948,817	\$71,470,393	\$73,134,297	\$74,821,825

Transfers, Uses, and Contributions to/from Reserves

Pipeline Replacement & Capital Investment

- Budgeted contribution of \$2,000,000
- Additional contribution from operating surplus \$3,510,485
- SCE claim settlement \$125,000
- Interest earned of \$330,666

OC San Pipeline Rehabilitation

- Contribution of \$426,224
- Interest earned of \$27,618

Operating Reserve

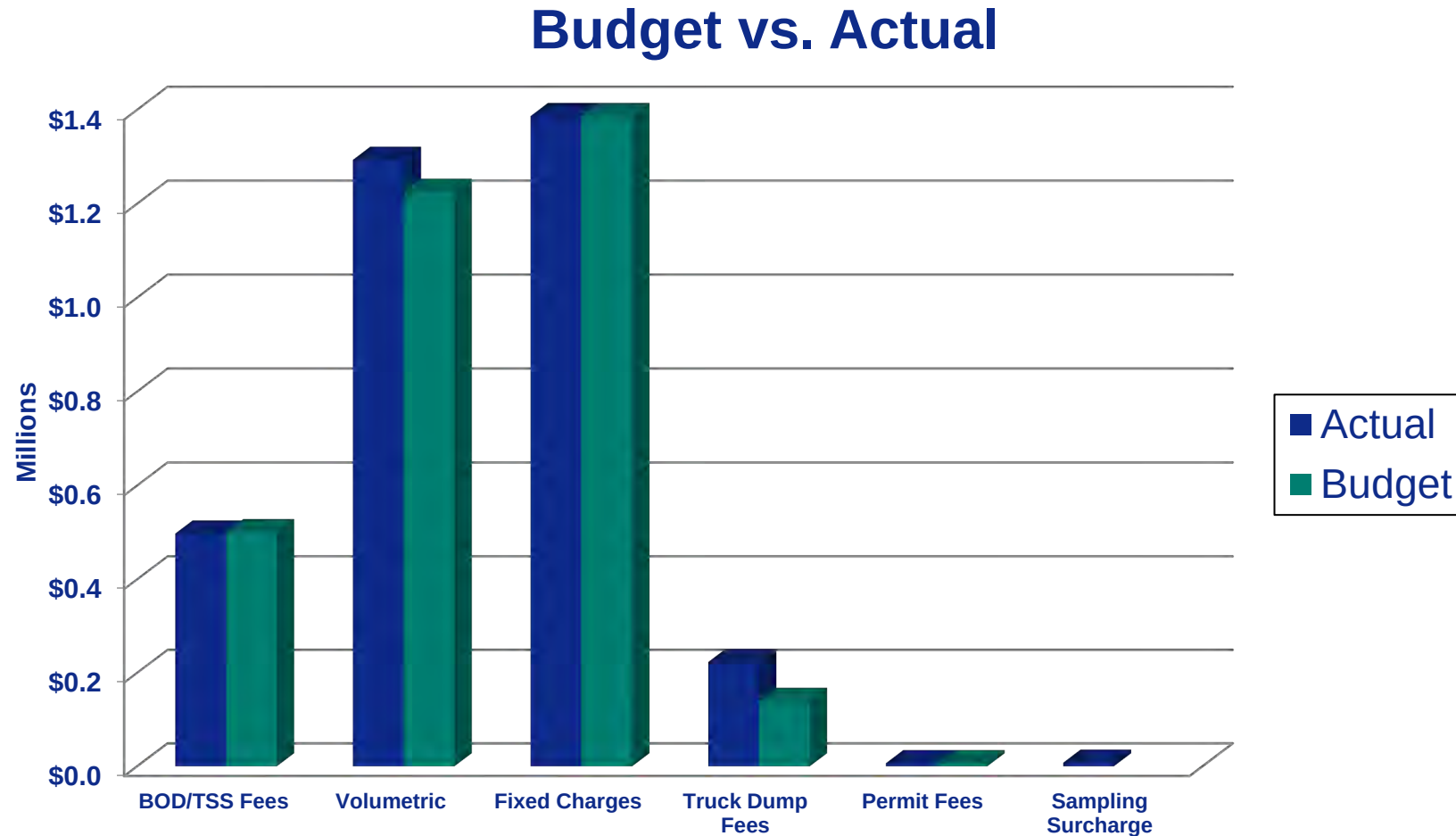
- Contribution of \$161,693
- Interest earned of \$19,543

Interest Earned (All Reserve Funds) - \$588,933

Total Operating Revenues

Source	Actual	Budget	Variance Positive/(Negative)
BOD/TSS Fees	\$497,633	\$500,700	(\$3,067)
Volumetric Fees	1,293,364	1,225,305	68,059
Fixed Charges	1,386,511	1,386,511	0
Truck Discharge	222,996	139,900	83,096
Permit Fees	6,500	6,500	0
Sampling Surcharge	7,661	0	7,661
Total Operating Revenues	\$3,414,665	\$3,258,916	\$155,749

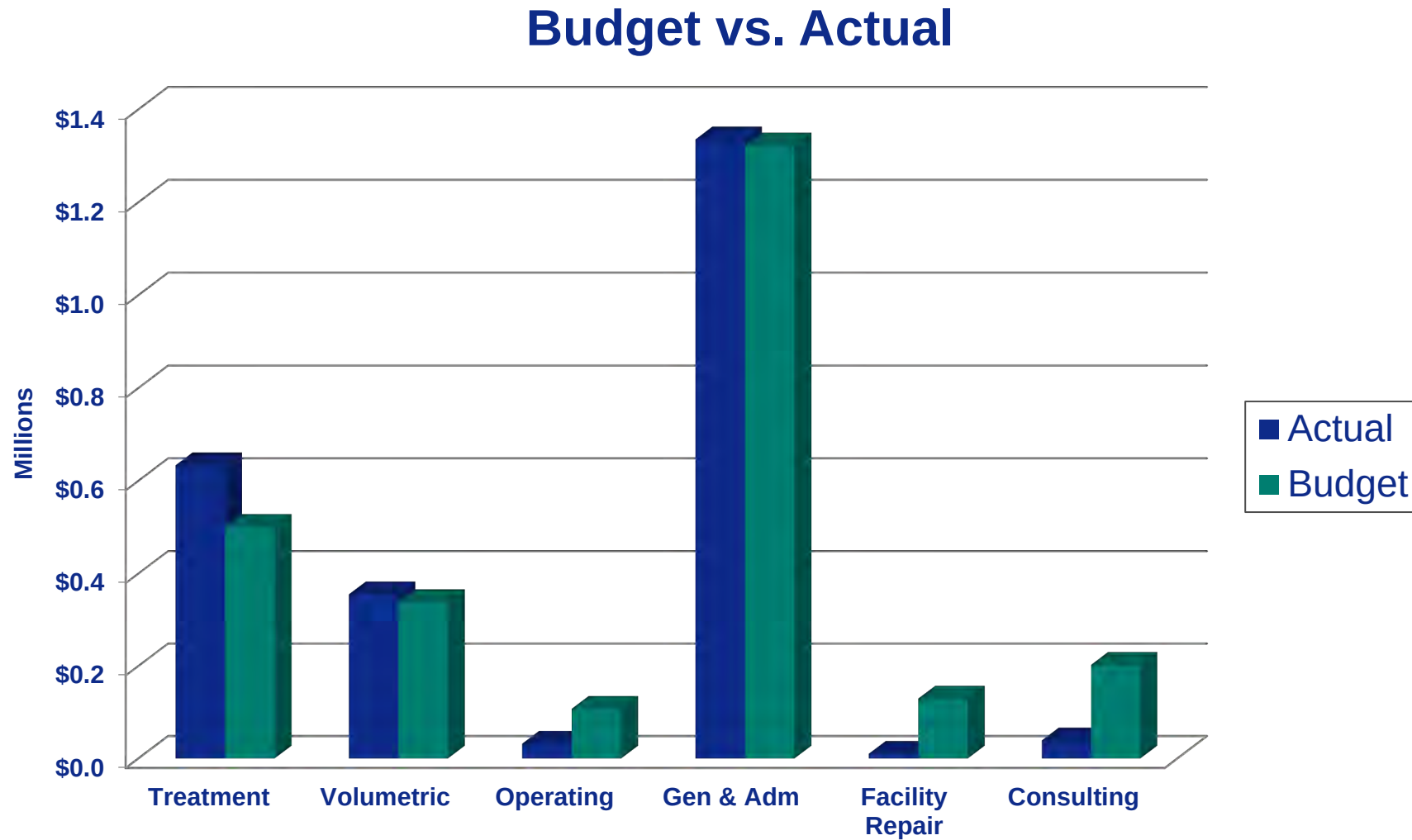
Operating Revenues vs. Budget



Total Operating Expenses

Source	Actual	Budget	Variance Positive/(Negative)
Treatment Costs	(\$633,484)	(\$500,700)	(\$132,784)
Volumetric Costs	(354,981)	(338,355)	(16,626)
Operating Costs	(31,858)	(107,315)	75,457
General & Administration	(1,335,354)	(1,322,322)	(13,032)
Facility Repair & Maintenance	(10,021)	(129,500)	119,479
Consulting & Prof. Services	(38,969)	(202,500)	163,531
Total Operating Expenses	(\$2,404,667)	(\$2,600,692)	\$196,025

Operating Expenses vs. Budget



Non-Operating Revenues and Expenses

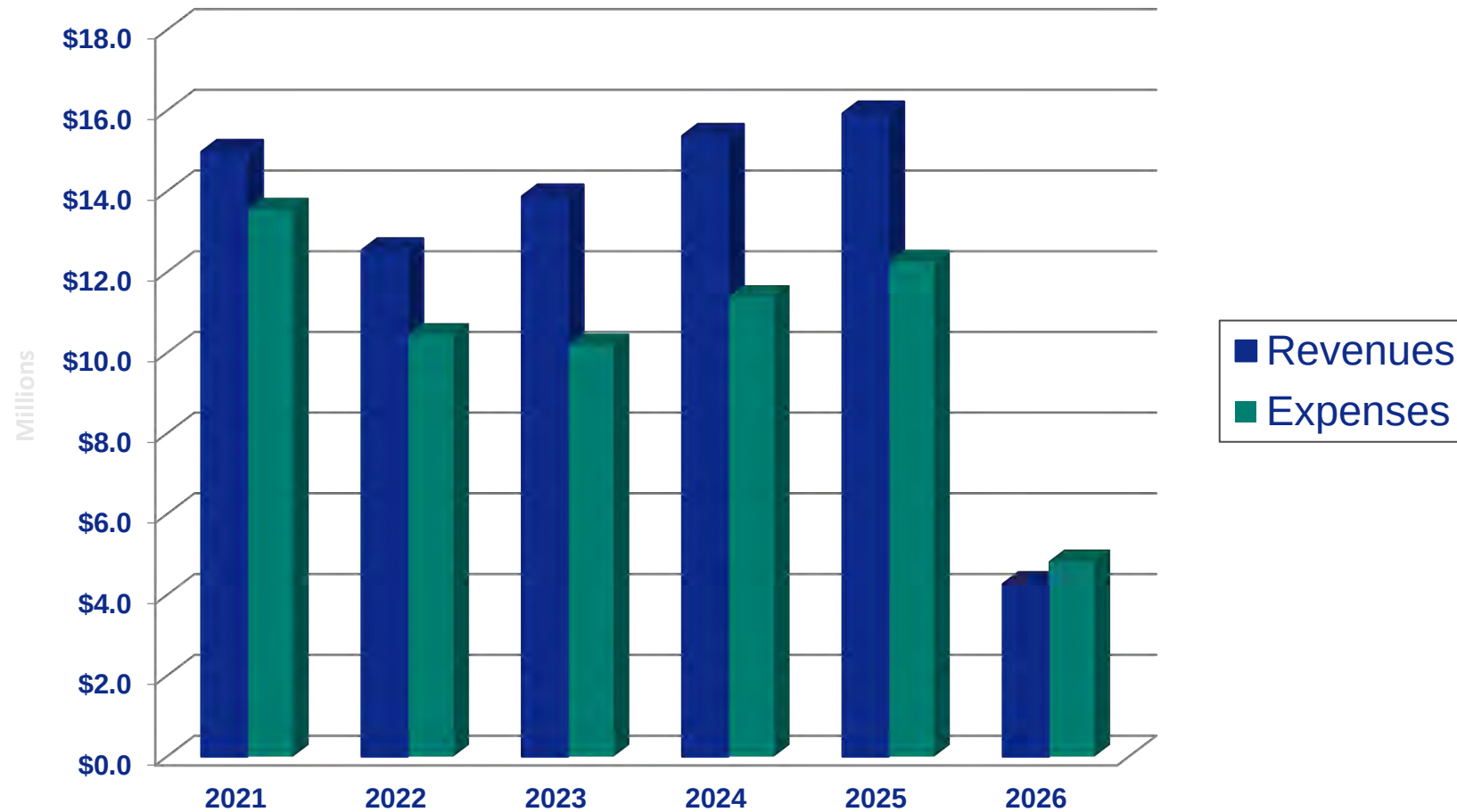
Source	Actual	Budget	Variance Positive/(Negative)
Interest & Investments	\$633,352	\$375,001	\$258,351
Other Income	125,100	0	125,100
Lease Capacity Sales	98,568	0	98,568
Debt Service	0	0	0
Contributions to Reserves	(2,426,224)	(2,426,224)	0
Total Non-Operating	(\$1,569,204)	(\$2,051,223)	\$482,019

5 Year Enterprise Performance

FYE	Revenue	Expense	Net Gain (Loss)
2021	14,979,869	(13,547,431)	1,432,438
2022	12,540,991	(10,440,350)	2,100,641
2023	13,875,754	(10,184,463)	3,691,291
2024*	15,375,569	(11,378,654)	3,996,915
2025	15,930,428	(12,258,790)	3,671,638
2026	4,271,685	(4,830,891)	(559,206)

- Revenues for 2024 does not include capital contributions of \$2,166,016 for the construction of the Agua Mansa Lateral which are one time revenue sources used to pay for construction.

5 Year Enterprise Performance



Enterprise Performance

Flow, BOD, TSS Actual vs. OC San Billing

	SAWPA Billed	OC San Billing	Difference
Total Flow (MG)	1,161.1698	1,153.810	7.3598
Total BOD (1,000 lbs)	277.7370	307.929	(30.1920)
Total TSS (1,000 lbs)	731.9814	971.900	(239.9186)
Flow - Pass through per MG	\$309.00	\$307.66	\$1.34
BOD cost per 1,000 lbs	\$416.00	\$414.76	\$1.24
TSS cost per 1,000 lbs	\$522.00	\$520.39	\$1.61

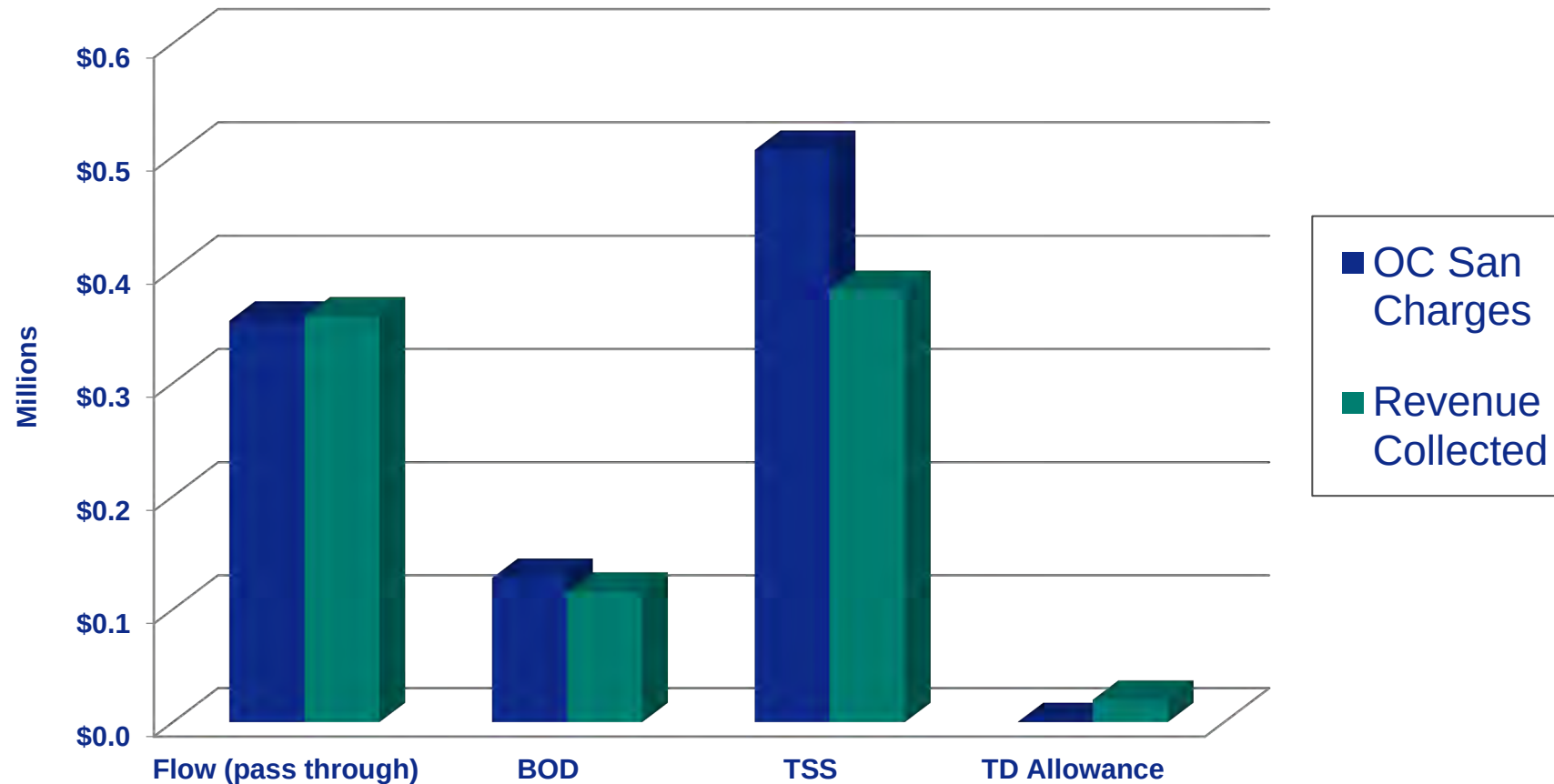
Enterprise Performance

OC San Flow, BOD & TSS Charges vs. Revenue Billed

	Revenue Billed	OC San Charges	Difference
Flow (pass through)	\$358,801	\$354,981	\$3,820
BOD	115,539	127,717	(12,178)
TSS	382,094	505,767	(123,673)
TD Allowance	19,749	0	19,749
Total	\$876,183	\$988,465	(\$112,282)

Enterprise Performance

OC San Flow, BOD & TSS Charges vs. Revenue Billed



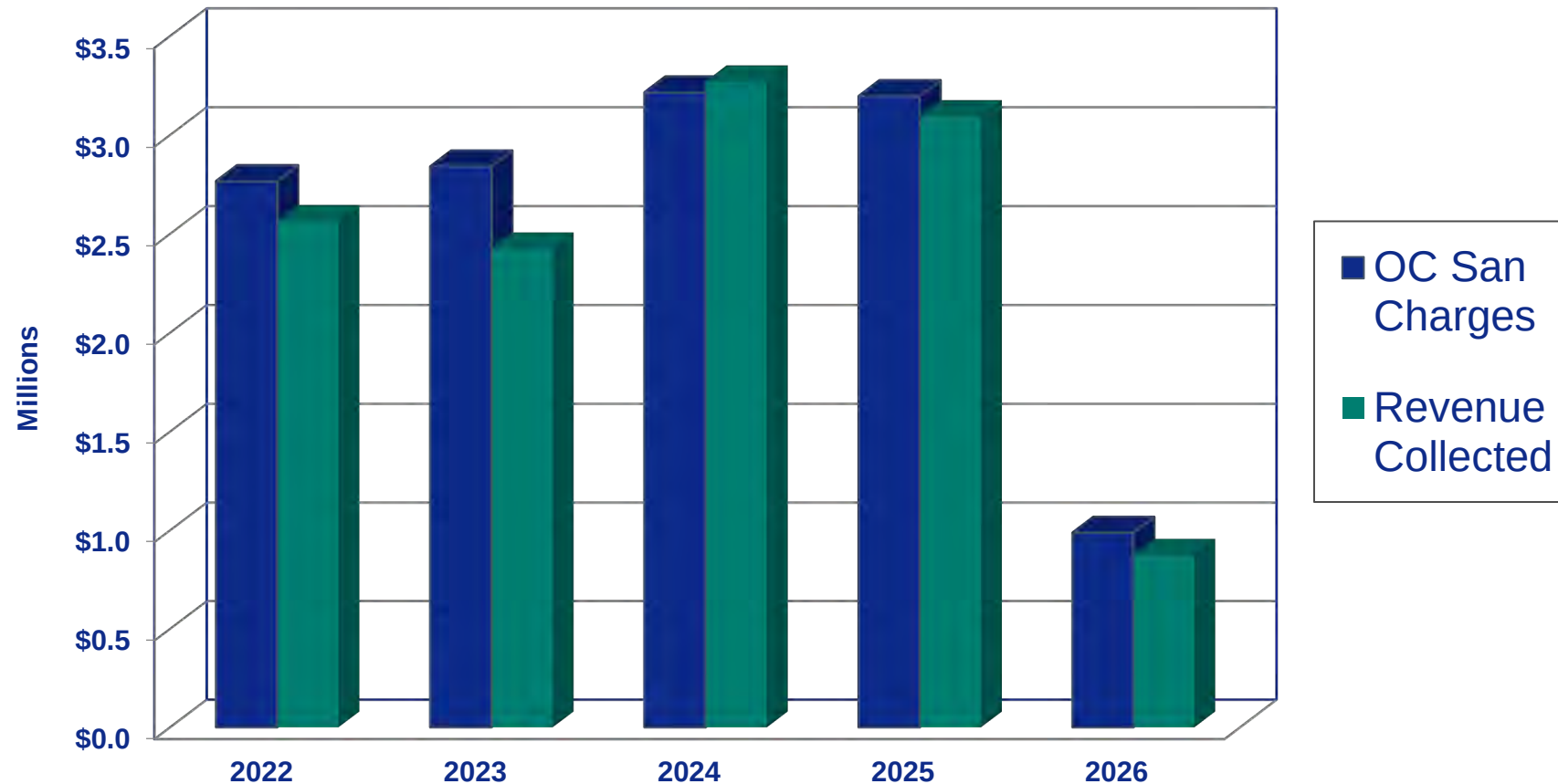
5 Year Enterprise Performance

Flow, BOD & TSS Charges vs. Revenue Billed – Last 5 Years

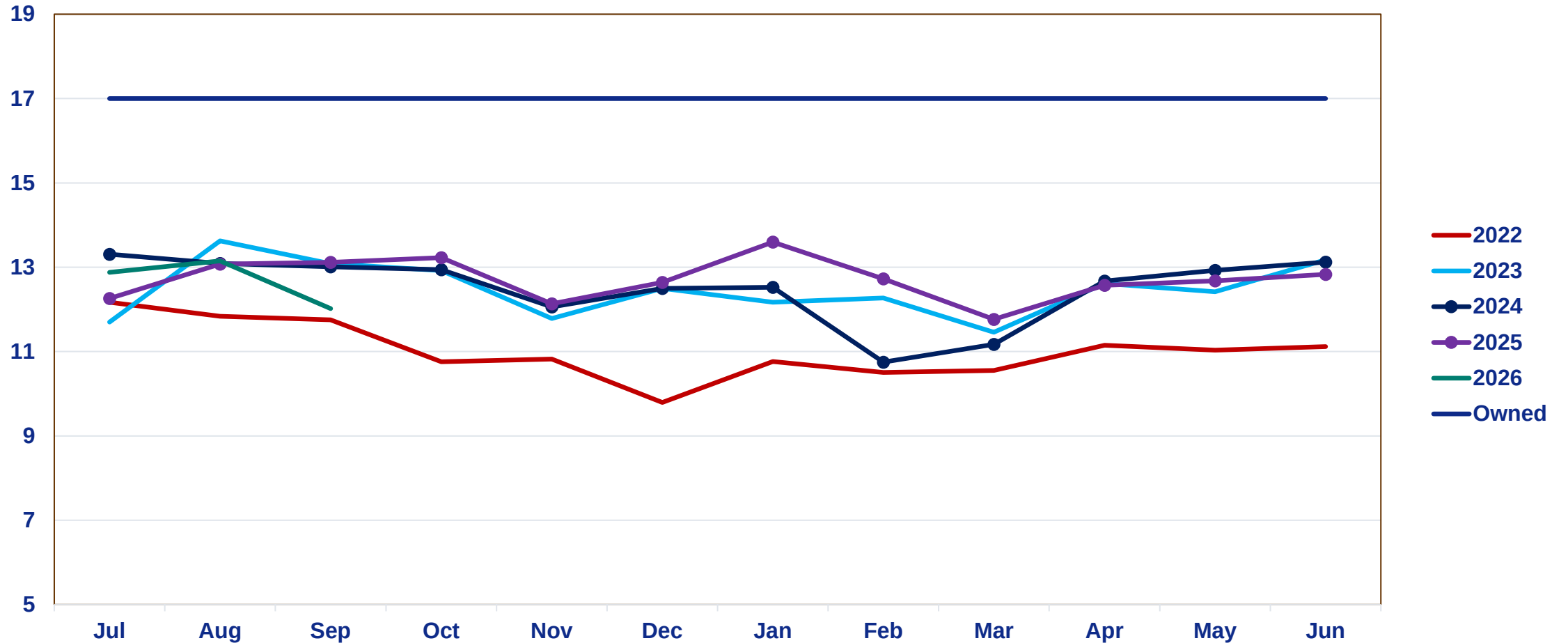
FYE	Revenue Billed	OC San Charges	Difference
2022	\$2,566,021	\$2,767,351	(\$201,330)
2023	2,427,005	2,841,389	(414,384)
2024	3,271,738	3,216,230	55,508
2025	3,095,983	3,197,354	(101,371)
2026	876,183	988,465	(112,282)
Total	\$12,236,930	\$13,010,789	(\$773,859)

5 Year Enterprise Performance

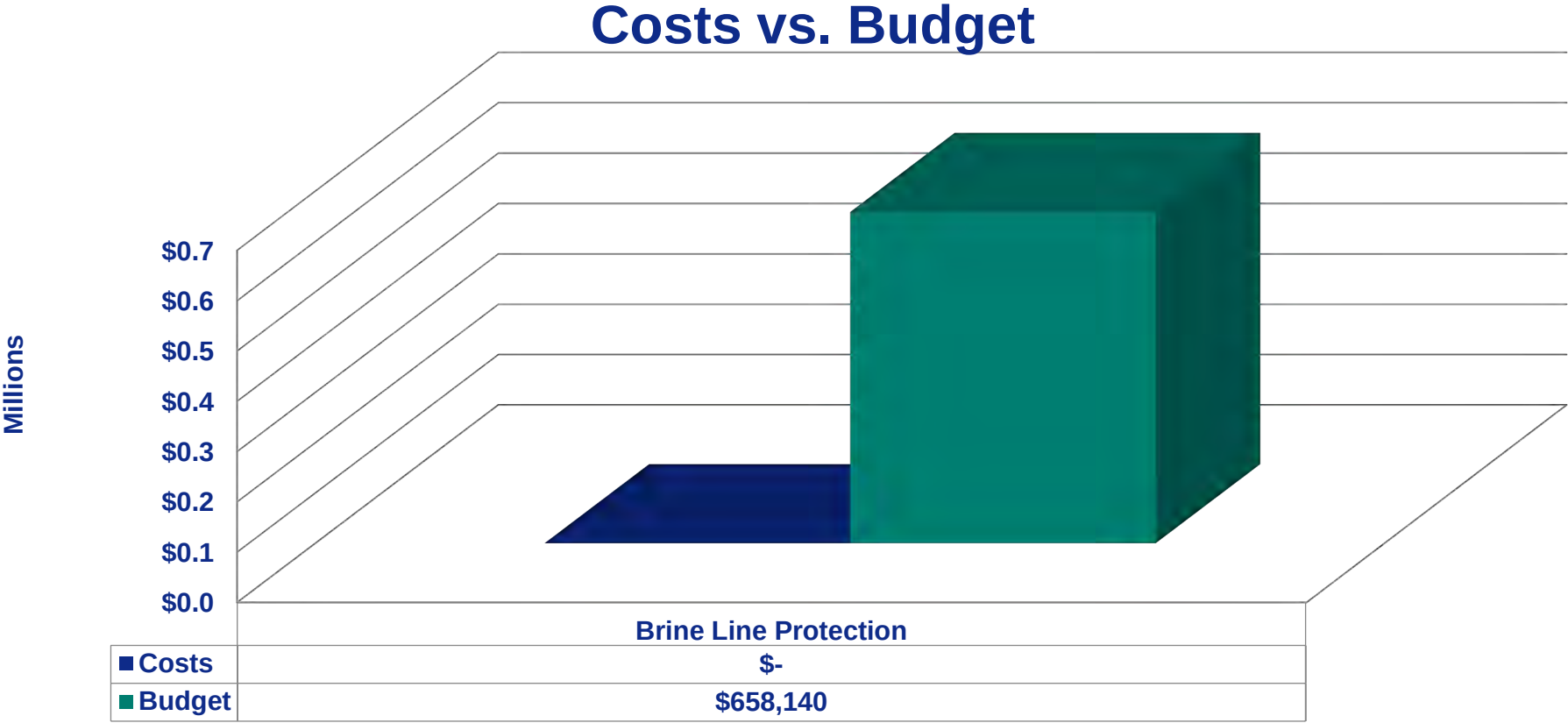
Flow, BOD & TSS Charges vs. Revenue Billed – Last 5 Years



Average Daily Flow



Capital Projects



Questions

Karen Williams
Santa Ana Watershed Project Authority
Office (951) 354-4231 | Cell (951) 476-5022
kwilliams@sawpa.org
sawpa.gov

