Meeting Agenda August 10, 2021 11:30 a.m. – 1:00 p.m.



Location: Zoom registration link

https://us02web.zoom.us/meeting/register/tZUrceCrrTkoHte5InJPp1ssED67OREJfdAm

The mission of Los Angeles Chapter of the WateReuse Association is to enhance the resiliency and sustainability of Los Angeles County by increasing the safe, beneficial use of recycled water. Its objectives shall be to promote water reclamation and recycling as a sustainable supplemental source of water for the state; to work for the adoption of legislation and regulations that allow the safe use of recycled water; to facilitate the development of technology aimed at improving water recycling; to promote legislation that would increase funding for water recycling projects; to provide mutual assistance and support between and among Chapter members involved with water recycling projects; and to increase public awareness and understanding of related water problems and solutions.

Welcome, Introductions and Instructions...... 11:30 a.m.

- 1. Host presentation: Treatment Plant Update: Operation and Optimization (*Tom Knoell, Everett Ferguson, Brittany Liu / WRD*)
- 2. Technical Topic: Mysteries and Myths of Microplastics Management (Shelly Walther / LACSD)
- 3. Water Recycling Legislative/Regulatory Updates
 - a. Special Guest: Federal Update (Greg Fogel / WateReuse Association)
 - b. State Update (Raymond Jay)
- 4. Regulatory Agency Update
 - a. Los Angeles Regional Water Quality Control Board (Steven Webb)
 - b. LA County Department of Public Health (Glenn Van Eekhout)
 - c. SWRCB Division of Drinking Water (Saeed Hafeznezami)
- 5. California State Section Update (Rafael Villegas)
- 6. Chapter Updates (Judi Miller)
 - a. June 2021 Member Meeting Summary
 - b. Emerging Professionals Committee Update (Alex Waite)
 - c. Membership Committee Update (Everett Ferguson)
- 7. Membership Roundtable (Jared Lee)
- 8. Next Meetings
 - October 12, 2021 Host: TBD; Sponsor: TBD
 - December 7, 2021 Host: City of Santa Monica; Sponsor: TBD
 - February 8, 2022 Host: TBD; Sponsor: TBD
- 9. Adjournment 1:00 p.m.

Los Angeles Chapter Officers for 2019/2021

Fred Gerringer, President	626-319-1107	fgerringer@hazenandsawyer.com
Jared Lee, Vice President	626-379-8443	JLee@burbankca.gov
Judi Miller, Secretary/Treasurer	213-228-8236	judi.miller@jacobs.com
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Raymond Jay, Past-President	213-217-5777	rjay@mwdh2o.com

Water Replenishment District Treatment Plant Update: Operation and Optimization



Tom Knoell, Everett Ferguson, Brittany Liu August 10, 2021



Treatment Plant Overview

- Three treatment plants: Albert Robles Center (ARC) AWTF, Leo Vander Lans (LVL) AWTF, Torrance Desalter.
- Total budget for the three plants \$18.5M.
- O&M budgets developed based on
 - Production goals, historical FYs expenses, revenues (e.g., MWD LRP program)

Operational Goals

- Two-step plan:
 - 1. Achieve the production target
 - 2. Optimize operations









Production



Albert Robles Center AWTF

Production Target: 10,000AF Production Achieved: 11,300AF



Torrance Desalter

Production Target: 3,500AF Production Achieved: 2,700AF



Production well redevelopment (January to May)

Leo Vander Lans AWTF

Production Target: 3,500AF Production Achieved: 3,800AF

LVL AWTF Projected VS Actual Production (AF)



Leo Vander Lans AWTF

Additional Goals:

- 1. Maximize RWC% to the "LA-side" of the seawater intrusion barrier to
- 2. Achieve WRD water independence at the barrier.





Optimization



Treatment Plant Optimization Focus

- Procedural Improvements SOP development (ARC, LVL), Edocumentation (operator logs via tablets, Google docs. (LVL, ARC), Implementation of a CMMS System (ARC, LVL, Torrance), Implementation of a well maintenance program (Torrance)
- Process Modifications chemical usage (ARC), membrane replacement (ARC), UV system operational mode (ARC).

Optimization Outcome:

- Maximize production
- Reduce unit cost of production (Cost (\$)/AF)
 - Fixed cost: Operational staffing
 - Variable Cost: Chemicals, Utilities, Analytical, etc.



- RO permeate is aggressive due to lack of minerals.
- Chemicals added to add alkalinity/hardness to reduce
 corrosivity.
- Maintain LSI target goal of +/- 0.5.
- During commissioning, contractor changed post treatment chemicals from calcium hydroxide to calcium chloride to achieve the specified permit turbidity requirement.



- Petitioned the Regional Board to relocate the turbidity compliance point to upstream of the post treatment chemical addition.
- Justification: Addition of corrosion control chemicals cause turbidity but do not introduce pathogens. Turbidity in excess of 0.2NTU are viewed as false indicators of pathogens.





- Calcium chloride:
 - \$93,014/month (July 2020 to March 2021 [average])
- Calcium hydroxide:
 - \$17,023/month (April 2021 to May 2021 [average])



Sodium Hydroxide Cost

- Caustic (with CaCl):
 - \$25,294/month (July 2020 to March 2021 [average])
- Caustic (with CaOH):
 - \$6,191/month (April 2021 to May 2021 [average])



LVL and Torrance Desalter Facilities Optimization





Thank you for your participation! Questions?





LOS ANGELES COUNTY SANITATION DISTRICTS

Converting Waste Into Resources

Mysteries and Myths of Microplastics Management

LA WateReuse Member Meeting

Shelly Walther Environmental Scientist Los Angeles County Sanitation Districts

August 10, 2021



Are WWTPs Discharging Mass Quantities of Microplastics?



Source: The Story of Stuff Project₂

Exponential Increase of Microplastics Papers since 2004



Adapted from Qin et al. 2020. Bibliometric Profile of Global Microplastics Research from 2004 to 2019. *Int J Environ Res Public Health*. 2020;17(16):5639.

Years since 2004

orb 0 MICROPLASTICS FOUND IN GLOBAL BOTTLED WATER

×

Microplastics & Popular Media

No Relationship Between WWTP Location and Microplastics



Marine Pollution Bulletin

Volume 124, Issue 1, 15 November 2017, Pages 245-251



Mountains to the sea: River study of plastic and non-plastic microfiber pollution in the northeast USA

Rachael Z. Miller *, 1, Andrew J.R. Watts b 21 22, Brooke O. Winslow *, Tamara S. Galloway b, Abigail P.W. Barrows



Negligible Amounts of Microplastics in WWTPs



Transport and fate of microplastic particles in wastewater treatment plants

Steve A. Carr, Jin Liu^{*}, Arnold G. Tesoro

San Jose Creek Water Quality Control Laboratory, Sanitation Districts of Los Angeles County, 1965 South Workman Mill Road, Whittier, CA 90601, USA

A R T I C L E I N F O

Article history: Received 14 September 2015 Received in revised form 9 November 2015 Accepted 4 January 2016 Available online 7 January 2016

ABSTRACT

Municipal wastewater treatment plants (WWTPs) are frequently suspected as *significant* point sources or conduits of microplastics to the environment. To directly investigate these suspicions, effluent discharges from seven tertiary plants and one secondary plant in Southern California were studied. The study also looked at influent loads, particle size/type, conveyance, and removal at these wastewater treatment facilities. Over 0.189 million liters of effluent at each of the seven tertiary plants were filtered using an assembled stack of sieves with mesh sizes between 400 and 45 µm. Additionally, the surface of 28.4



WWTPs: Field & Lab Measurements





Methods matter

Look-Alike Particles









Source: Carr et al. 2016

Methods matter

Look-Alike Particles



Source: Dyachenko et al. 2017

Methods matter

Orders of magnitude difference?

- A study of 28 Chinese WWTPs estimated the total MP in sludge from all Chinese WWTPs to be 1.56×10¹⁴ particles per year.
- Another study found that one large Swedish WWTP had ~10¹⁴ particles per year in its sludge.



- So, did one Swedish WWTP have as much microplastics as all Chinese WWTPs combined?
- Of course not

Li, Xiaowei, Lubei Chen, Qingqing Mei, Bin Dong, Xiaohu Dai, Guoji Ding, and Eddy Y. Zeng. 2018. 'Microplastics in Sewage Sludge from the Wastewater Treatment Plants in China'. *Water Research* 142 (October): 75–85. <u>https://doi.org/10.1016/j.watres.2018.05.034</u>.

Chand, R., Rasmussen, L.A., Tumlin, S. and Vollertsen, J., 2021. The occurrence and fate of microplastics in a mesophilic anaerobic digester receiving sewage sludge, grease, and fatty slurries. Science of The Total Environment, p.149287. <u>https://doi.org/10.1016/j.scitotenv.2021.149287</u>

Methods Matter...

Sample Processing



COMMUNICATION



View Article Online View Journal | View Issue



Cite this: Anal. Methods, 2017, 9, 1412

Received 25th August 2016 Accepted 12th October 2016

Extraction and identification of microplastic particles from secondary wastewater treatment plant (WWTP) effluent

A. Dyachenko,^a J. Mitchell^a and N. Arsem^{*b}



Research and Monitoring

 Legislative mandates
 SB 1422: CA Safe Drinking Water Act: Microplastics

 SB 1263: OPC Statewide Microplastics Strategy

Research

- SCCWRP microplastics method evaluation study
- Microplastics Risk Assessment
- OPC POTW microplastics study



eadlines

CA Safe Drinking Water Act: Microplastics SB 1422 (2018)

Define 'microplastics'

July 1,2020

July 1,2021 -

Standard method
Four years of testing
Health-based guidance level
Accredit laboratories

13

Drinking Water: Two-Phased Monitoring Approach

Depth Phase

• Few water systems

2022

- Characterize particle distributions
- Diverse sources & treatments
- Develop tier 1 methods

2024

Breadth Phase

2026

- Many water systems
- Tiered monitoring approach

Typical

Monitoring

OPC Microplastics Strategy: SB 1263

- Bill was signed in September 2018
- Develop and implement a Microplastics Strategy (Prioritized Research Plan):
 - Assess the ecological risks of microplastics
 - Investigate sources and pathways
 - Evaluate options to reduce microplastic pollution and recommend policy





Microplastics are Diverse



Chemical Confirmation is Critical





F:\Sandy Hook\MSDchem-1\Data\MICRO PLASTICS\2019\U Toronto\20190820 03.D

A Common Approach to Analyzing Microplastics

- 1. Treat your sample to remove some of the matrix (not all do this)
- 2. Sort through the sample and identify particles you think are plastic candidates
- 3. Pick the particles one by one. Analyze 20-30% of them for their polymer composition. Estimate the rest.



This was the gold-standard for several years And this method is still routinely used

Common Steps in Microplastics Analysis





SampleParticleParticleCollectionExtractionIdentification & Categorization	Pictures & Measurements	Chemical Analysis
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Analytical issues

- We only want to:
- Find **all** microplastics in the sample
- **Quantify** plastics down to as low a size as possible
- Know the characteristics of each microplastic
- Avoid false positive and false negative identifications
- Avoid contamination
- Use a method that is accurate, fast, AND inexpensive



Don't Forget QA/QC

Study Design Elements

Question-driven design, Informed by predicted variability **Data Quality Objectives** Reproducible **Contamination prevention Blanks** High volume or composite samples **Duplicates - lots! Spike recoveries Appropriate analyses Transparent reporting**

The Issue About Counting Microplastics: Particle numbers are not a conserved quantity of measure

Imagine that a mysterious force broke MPs in a sample into ever smaller pieces...

For each MP 1 mm You'd end up with 1 billion MPs of 1 µm

But the same plastic mass remains...



Therefore:

- The **smaller** the particles you can see, the **more particles** you will find.
- Reporting microplastics as counts-only is subjective.
 - Are there more microplastics after they've become smaller particles?
 - Or did the properties of the microplastics simply change?
 - Particle characteristics matter, but cannot stand alone for quantification.

An evolved approach to analyzing microplastics

- 1. Sample your system with a high-quality approach
- 2. Treat your sample to remove most of the matrix without damaging the plastics
- 3. Deposit the microplastics concentrate on a window or filter
- 4. Scan / analyze the whole surface with FTIR or Raman
- 5. Alternatively take the particles from 2) and pyrolyse them

This leads to more microplastics identified,

but have you found them all?

Evolution of Microplastics Analysis



Pathways and Fluxes are Mostly Unknown



Sources and Loadings

We are filling our oceans with microplastics

Approximately 8000 tons of primary microplastics are generated annually in Norway. About half will end up in the ocean. If 8000 tons of microplastics were dumped in downtown Bergen, its citizens would stand knee deep in microplastics. The main source of microplastic waste is car tires.



OPC-Funded Study by SCCWRP: Efficacy of microplastics removal from wastewater treatment plants



Environmental Risks: Unknown



In Progress

Potential Tiered Monitoring Framework



Based on Cousins et al. (2020). Environmental Science: Processes and Impacts



Potential Microplastics Monitoring Decision Tree



Coming soon...

2021-2022 Statewide Microplastics Strategy

OPC CA POTW Microplastics study

Standard methods for microplastics in drinking water

Lab Accreditation / 4-year Monitoring requirements

Microplastics Risk Assessment Recommendations to SWRCB

Coming soon...

2026

Risk Assessment Framework

Standardized Methods

Baseline Occurrence Data

Investigate Sources and Pathways

Recommend Source Reduction Strategies

Coming...

Water Quality Objectives



WateReuse California Los Angeles Chapter Meeting

WATEREUSE LOS ANGELES

August 10, 2021 Legislation & Regulation Update

Raymond Jay Metropolitan Water District of Southern California (213) 217-5777 or rjay@mwdh2o.com

2021 California Legislative Calendar

🧕 Jan. 1

Jan. 10

Feb. 19

Apr. 30

May 7

June 4

June 15

Sept. 10

2

6

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- Statutes take effect
- Jan. 4 Legislature reconvenes
 - Governor submits budget to Legislature
 - Last day for bills to be introduced
 - Last day policy comm. to report fiscal bills
 - Last day fiscal comm. to report fiscal bills
 - Last day for bills to pass house of origin
 - Last day to pass budget
 - Last day for any bill to be passed
- Oct. 10 Last day for Governor to sign or veto bills
- See: <u>http://assembly.ca.gov/legislativedeadlines</u>

Drought

- Drought emergency in 41 of 58 counties
- SWRCB emergency curtailment in Delta
- Lake Oroville power plant shut down
- Southern California has sufficient storage for next few years but urges conservation



Regulatory update

Cross Connection Control Handbook – Title 17

- Use of Swivel-ell requirements
- First Public Hearing April 27
- DDW is evaluating comments
- Second public comment, Public Hearing, & Board adoption : TBD
- https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/cccph/cccph_draft_feb2021.pdf
- https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/cccph.html
- Water Use Efficiency Implementation
 - RW variances and potable use credit Workshops
 - Potential variances for RW with >1,200 mg/l TDS
 - Proposed adoption in October 2021

DPR Draft Regulations update

- Adopt regulations by 2023
- Framework Addendum 3/22/21
- https://www.waterboards.ca.gov/drinking water/certlic/drinkingwater/documents/direct potable re use/dprframewkaddendum.pdf
- Comments/concerns identified
 - RWA vs TWA requirements
 - Operator requirements
 - Pathogen LRV requirements
 - Treatment flexability
 - Direct Potable Reuse Responsible Agency (DiPRRA)
 - Technical, Managerial, and Financial (TMF) Capacity
- Comments submitted June 25, 2021
- Additional info:

https://www.waterboards.ca.gov/drinking water/certlic/drinkingwater/direct potable reuse.html

Questions?

If you have any questions, please contact:

Raymond Jay, Past President

SANGELES

c/o Metropolitan Water District of Southern California 700 N Alameda Street Los Angeles, CA 90054 (213) 217-5777 rjay@mwd.h2o.com



Regulatory Agency Updates

- ► Los Angeles Regional Water Quality Control Board
 - Steven Webb

Los Angeles County Department of Public Health - Glenn Van Eekhout

State Water Board Division of Drinking Water

- Saeed Hafeznezami





Last WateReuse CA Board of Trustees Meeting: May 14, 2021 Next WateReuse CA Board of Trustees Meeting: September 19, 2021

2021 WateReuse Annual Conference – At a Glance

- 48 Technical Sessions
- 7 Panel Presentations
- 2 Tours
- Many networking opportunities

Location



JW Marriott Hotel Los Angeles at L.A. LIVE 900 West Olympic Los Angeles, CA 90015, US



2021 WateReuse California ANNUAL CONFERENCE

UILDING A RESILIENT FUTURE TOGETHER





WateReuse Annual Conference Sunday (9/19) Topics



Declining Flows (3)

Topics in white indicate LA Chapter representation (#) is r

(#) is number of presentations 2



3

WateReuse Annual Conference Monday (9/20) Topics



Topics in white indicate LA Chapter representation (#) is number of presentations



WateReuse Annual Conference Tuesday (9/21) Topics



Topics in white indicate LA Chapter representation (#) is number of presentations 4



WateReuse Annual Conference Panel Discussions

Same but different - CA Utilities Share What's Most Important for Reuse Projects Su	3 n	Bioanalytical Screening in Recycled Water – Current Status, Challenges and Opportunities Sun	Multi-Pronged Approach to Make Technology Work for Regulatory Success of DPR Mon
Partnerships for Success with the Regional Recycled Water Program	on	Alternative Approaches for Chemical and Pathogen Control in CA DPR Projects Tues	Water Reuse Communications in 2021 and Beyond: Developments and Best Practices Tues

Topics in white indicate LA Chapter representation



Facility Tours



Albert Robles Center for Water Recycling and Environmental Learning In-Person Tour Sunday, September 19, 12:00 pm *Capacity:* Limited to 50 people *Fee:* Included in registration

TAKE A VIRTUAL TOUR Regional Recycled Water Advanced Purification Center



Regional Recycled Water Advanced Purification Center Live Hosted Virtual Tour Sunday, September 19, 1:00 pm *Fee:* Included in registration



WRCA Chapter Leadership Summit 9/21/21

- 7 CA Chapter Leadership Summit (during annual conference)
- Roundtable Discussions

CA Water Conservation

- Governor Newsom calls for voluntary 15% reduction in water use
- Executive Order N-10-21
- 50 of the state's 58 counties under the drought state of emergency

2022 CA Plumbing Code Joint Comment Letter

- WRCA and Irvine Ranch Water District (IWRD) submitted joint letter
- Changes to CA Plumbing Code impacts dual plumbing buildings
- Requested changes in four sections

Chapter Updates (Judi Miller)

➤April Meeting Summary

- Volunteer Opportunities

 Meeting Summary preparation
 Virtual lobby networking host
- Technical Topics Committee o New Chair: Alex Franchi <u>Alex.Franchi@aecom.com</u>

- Emerging Professionals Committee Update
 - Alex Waite

<u> Alex.Waite@SMGOV.NET</u>

- ≻New Membership Committee
 - Everett Ferguson

eferguson@wrd.org



Membership Roundtable (Jared Lee)



Next Meetings

≻Tuesday, October 12, 2021 – Virtual?

≻Tuesday, December 7, 2021 – In-person?

