Brine Line Discharger Summary

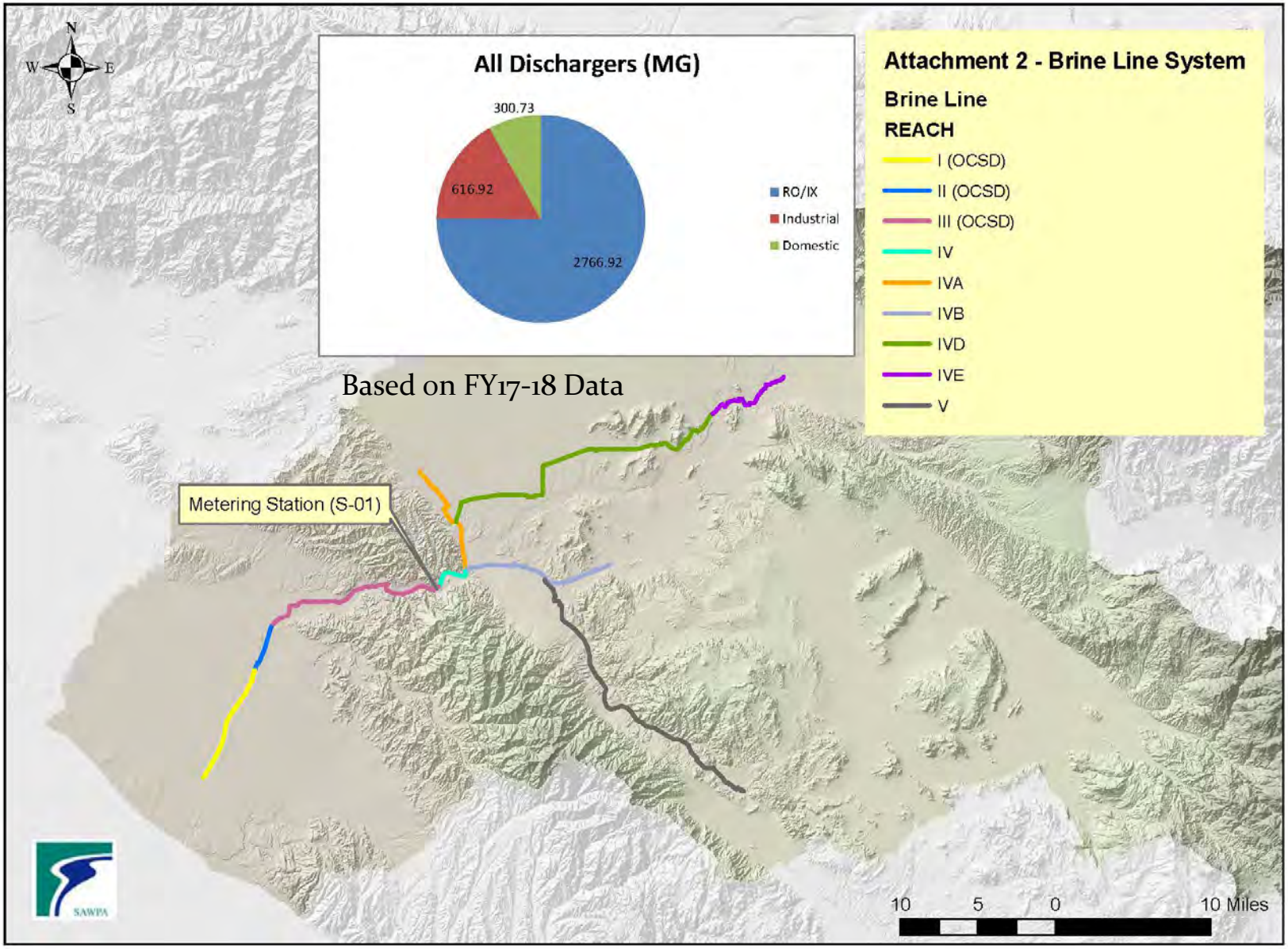
SAWPA Commission

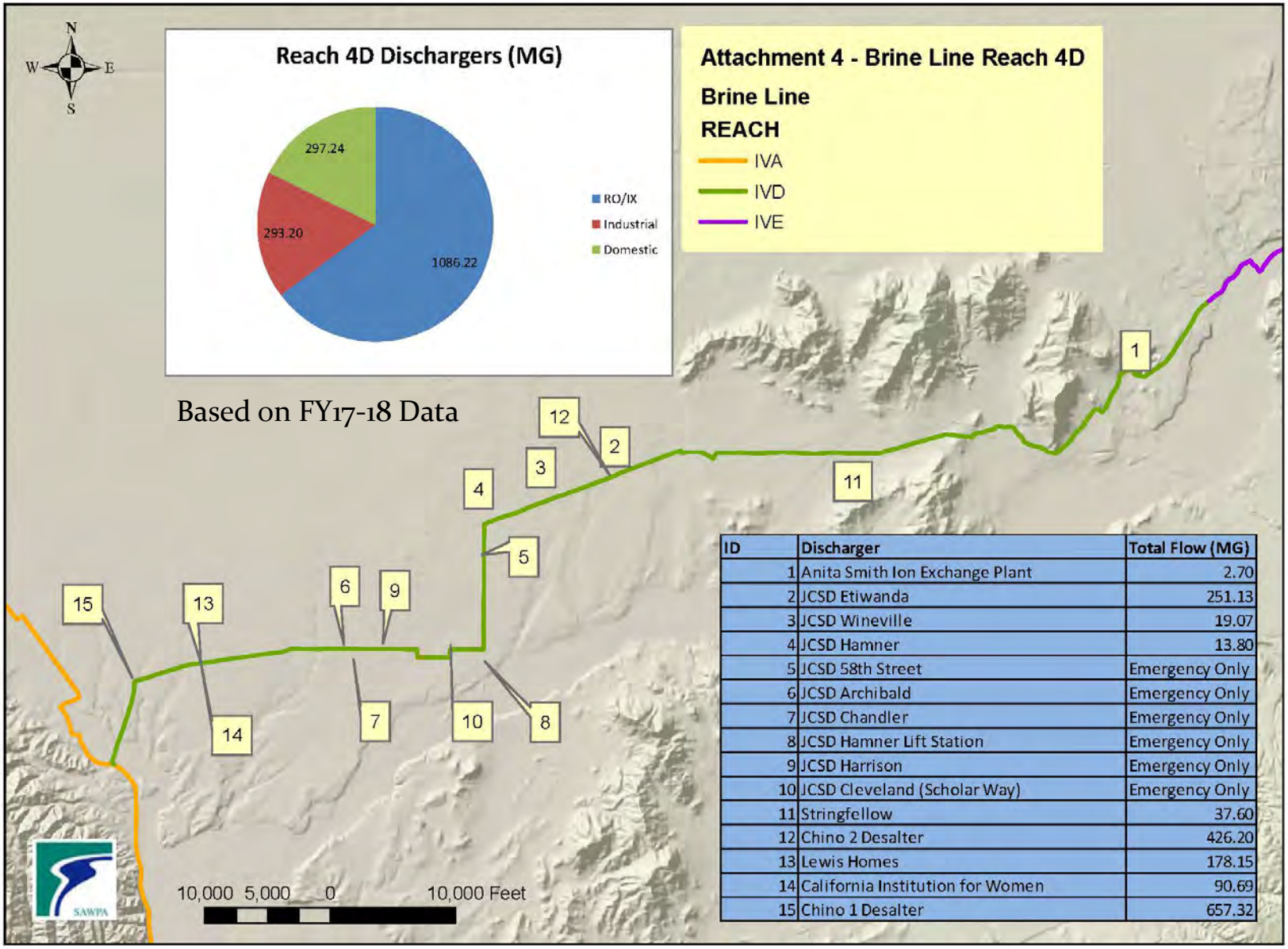
November 6, 2018

Item 5.A.

Recommendation

- Receive and file


All Dischargers (MG)
300.73
616.92
2766.92
RO/IX
Industrial
Domestic
Attachment 2 - Brine Line System
Brine Line
REACH
I (OCSD)
II (OCSD)
III (OCSD)
IV
IVA
IVB
IVD
IVE
V
Based on FY17-18 Data
Metering Station (S-01)
N
W
E
S
SAWPA
10
5
0
10 Miles



ID	Discharger	Total Flow (MG)
1	Anita Smith Ion Exchange Plant	2.70
2	JCSD Etiwanda	251.13
3	JCSD Wineville	19.07
4	JCSD Hamner	13.80
5	JCSD 58th Street	Emergency Only
6	JCSD Archibald	Emergency Only
7	JCSD Chandler	Emergency Only
8	JCSD Hamner Lift Station	Emergency Only
9	JCSD Harrison	Emergency Only
10	JCSD Cleveland (Scholar Way)	Emergency Only
11	Stringfellow	37.60
12	Chino 2 Desalter	426.20
13	Lewis Homes	178.15
14	California Institution for Women	90.69
15	Chino 1 Desalter	657.32

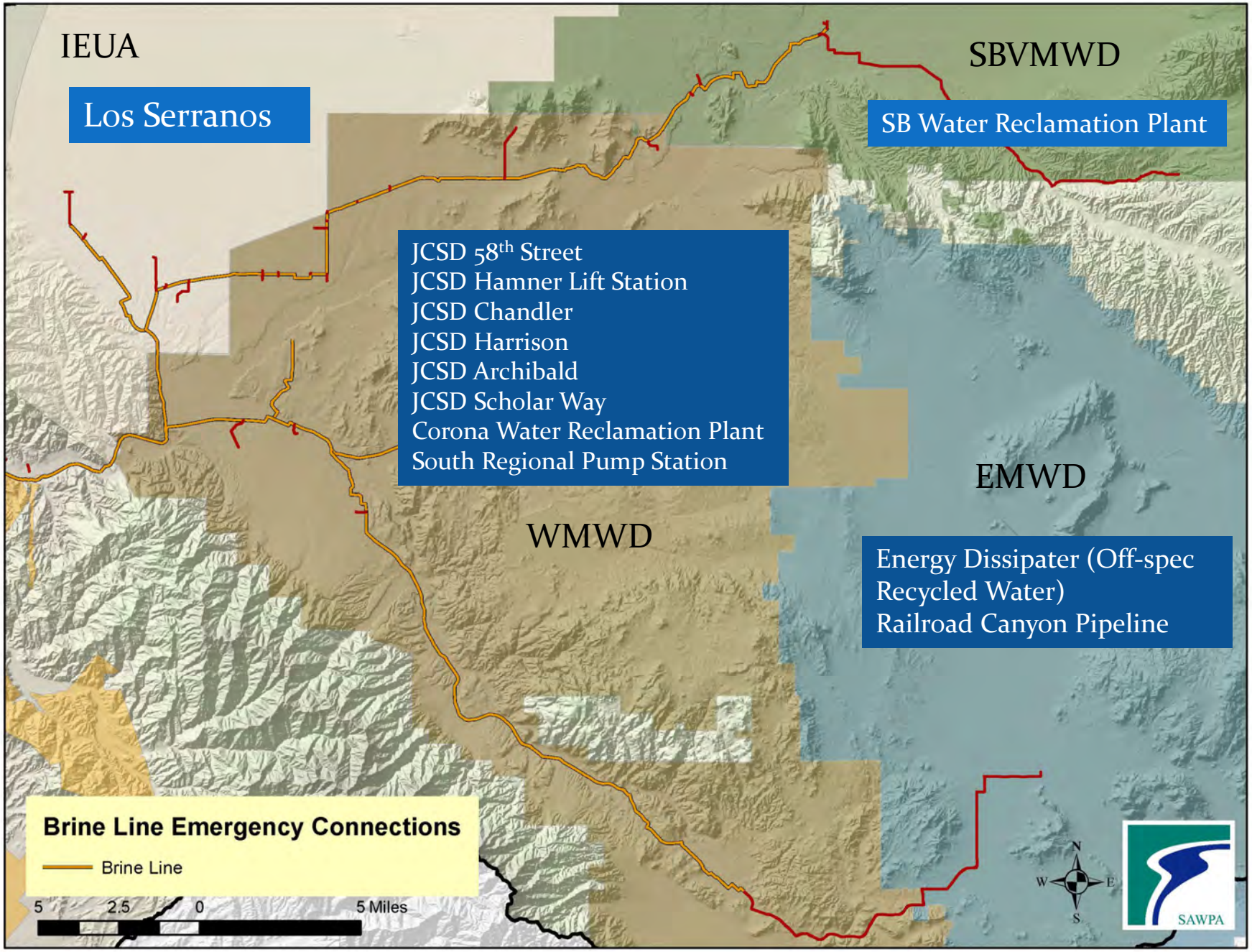

~100 homes
JCSD Etiwanda Lateral
Brine Line

Domestic Connections Diverted

JCSD 58th Street
JCSD Harrison
JCSD Archibald
JCSD Hamner List Station
JCSD Chandler
JCSD Scholar Way

California Rehabilitation Center

Lewis Homes


IEUA
Los Serranos
SBVMWD
SB Water Reclamation Plant
JCSD 58th Street
JCSD Hamner Lift Station
JCSD Chandler
JCSD Harrison
JCSD Archibald
JCSD Scholar Way
Corona Water Reclamation Plant
South Regional Pump Station
WMWD
EMWD
Energy Dissipater (Off-spec Recycled Water)
Railroad Canyon Pipeline
Brine Line Emergency Connections
Brine Line
5 2.5 0 5 Miles
N
W
E
S
SAWPA

Recommendation

- Receive and file

Questions??

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Brine Line Billing Formula

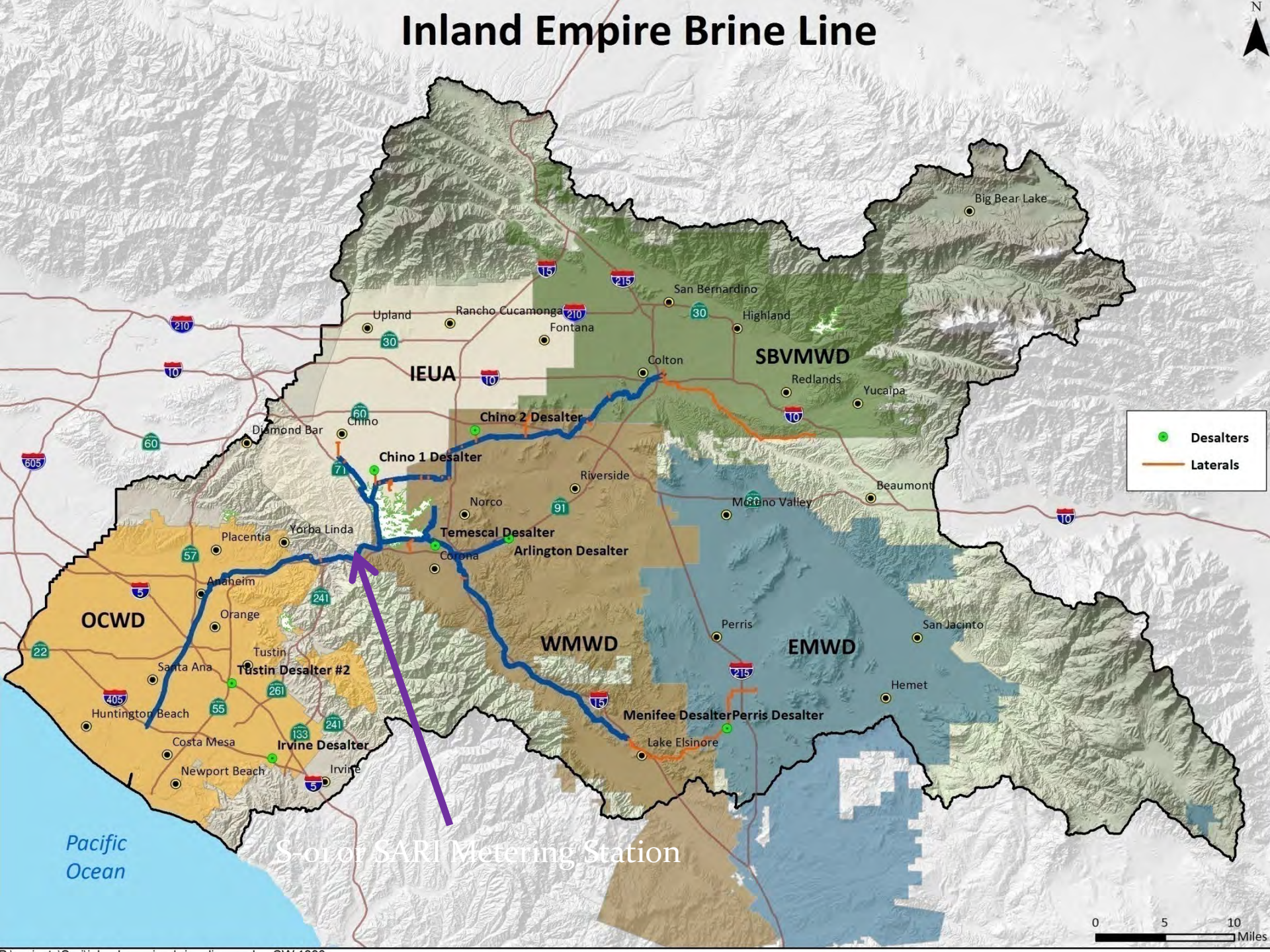
SAWPA Commission

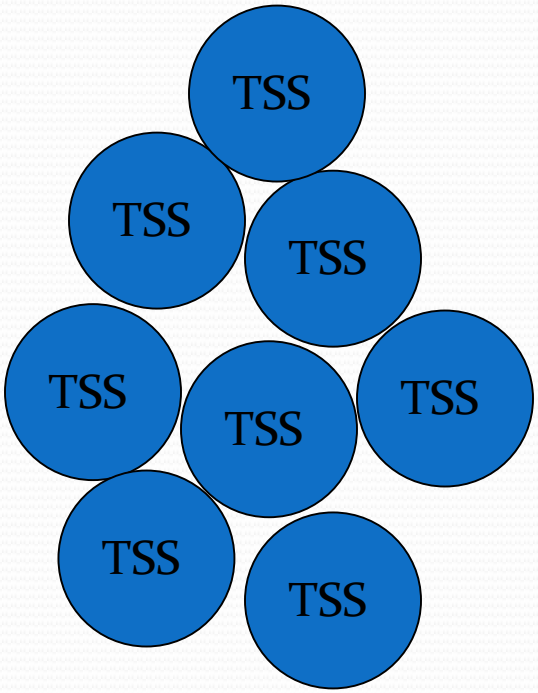
November 6, 2018

Item 5.B

Recommendation

- Receive and file a report on the Water Quality Monitoring Efforts
- Maintain the current billing formula


Inland Empire Brine Line
N
Big Bear Lake
San Bernardino
Upland
Rancho Cucamonga
Fontana
Highland
IEUA
SBVMWD
Colton
Redlands
Yucaipa
Chino
Diamond Bar
Chino 2 Desalter
Chino 1 Desalter
Riverside
Norco
Beaumont
Moreno Valley
Placentia
Yorba Linda
Temescal Desalter
Arlington Desalter
Corona
Anaheim
OCWD
Orange
WMWD
EMWD
Perris
San Jacinto
Tustin
Santa Ana
Tustin Desalter #2
Hemet
Huntington Beach
Menifee Desalter
Perris Desalter
Lake Elsinore
Costa Mesa
Irvine Desalter
Newport Beach
Irvine
Pacific Ocean
S-01 or SARI Metering Station
Desalters
Laterals
0
5
10
Miles



SARI METERING STATION

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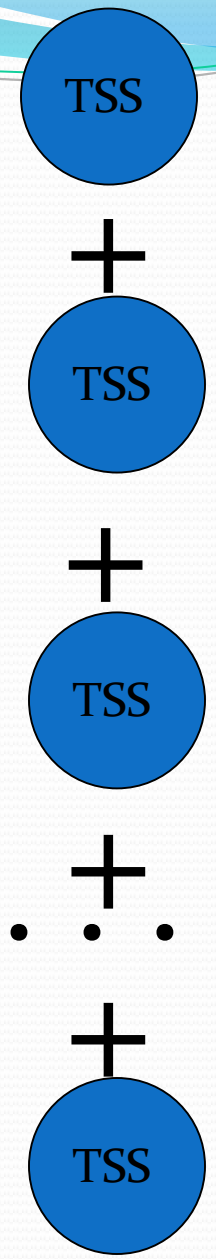
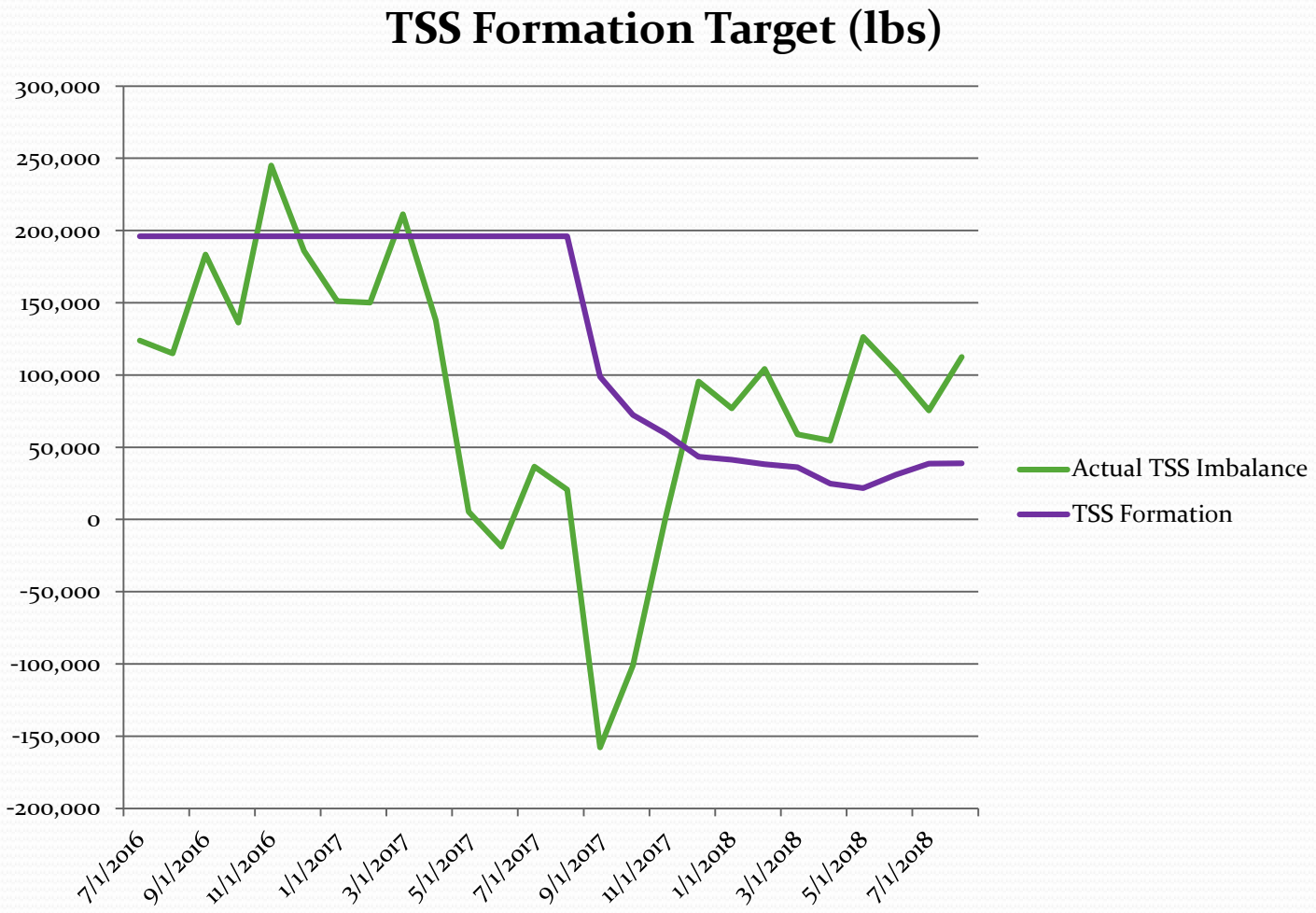


DISCHARGERS

TSS Formula - Background

- TSS Formation Billing Formula in use since 2007
  - Allocates TSS formed to contributing discharges
- Previous studies evaluated sample collection, labs, billing formula
  - “Representative Sample” – stinger depth, missed samples
  - Lab testing – 3 labs, triplicate samples
  - Billing Formula – last major update 2016

TSS Formation 7/16 – 7/18



Trussell Technologies Slides

WQ Monitoring Efforts

Component	Percent of Total Suspended Solids				Cost Allocation Parameter
	April 2016	August 2016 - March 2017	April 2017 - March 2018	2016-2018	
Microbial Biomass	31%	95%	58%	61%	Dissolved BOD5
Calcium Minerals	69%	0%	0%	23%	Dissolved Calcium (40%)
					Alkalinity (60%)
Other Inorganics	0%	5%	42%	16%	Flow-based "service charge"
Total	100%	100%	100%	100%	

Refined Billing Equation

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

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*

Trussell TECHNOLOGIES INC

Recommendation

- Receive and file a report on the Water Quality Monitoring Efforts
- Maintain the current billing formula

Update on Brine Line Solids Formation

November 6, 2018

Emily Owens-Bennett, P.E., Bryan Trussell, P.E., BCEE

Trussell Technologies, Inc.

Monitoring Program (2017)

County Line

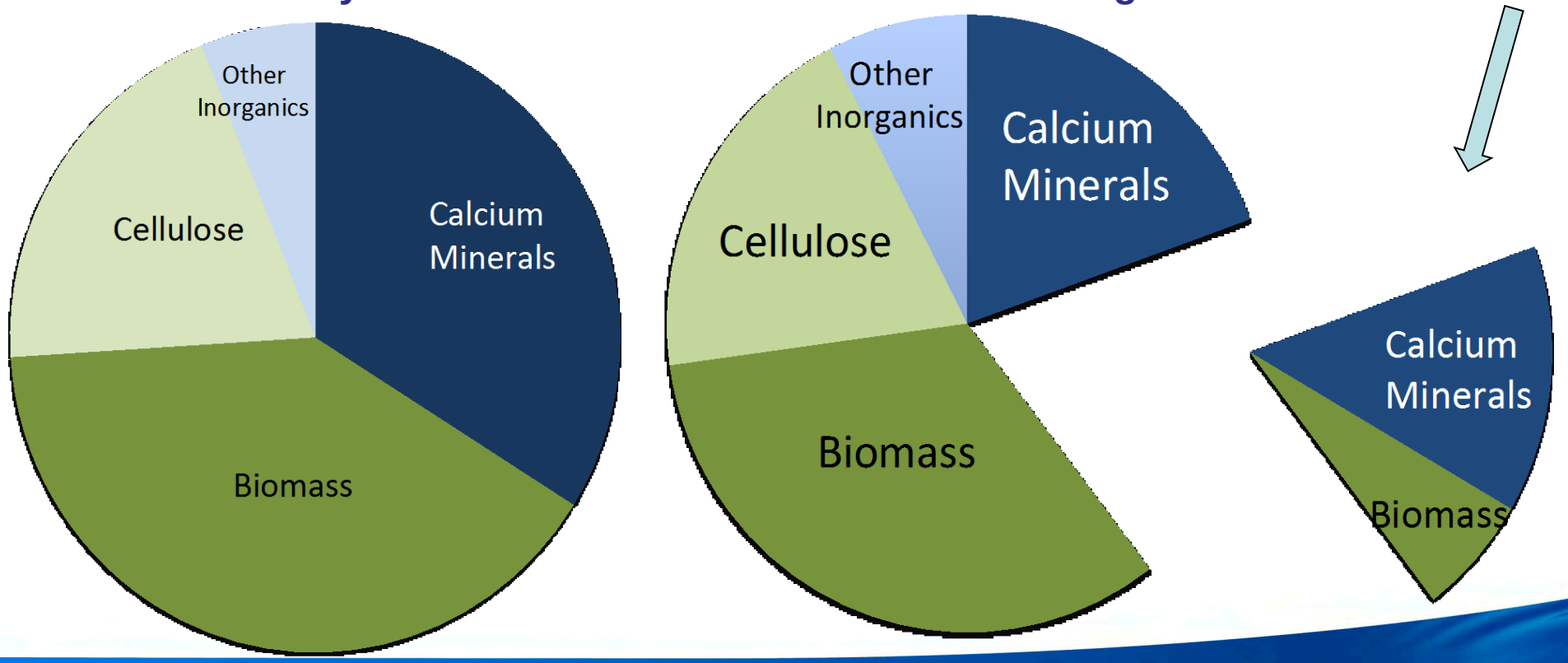
Constituent/Analysis	Test Method	Frequency	Notes
Flow	-	Online monitoring	
pH	-	Online monitoring	
BOD_5	SM 5210B	Weekly	Total and dissolved (TSS filter); Total analysis in triplicate
TSS	SM 2540D	Weekly	Analysis in triplicate; Expedited analysis (<24h hold)
VSS	EPA 160.4	Weekly	Analysis in triplicate; Expedited analysis (<24h hold)
Alkalinity	SM 2320B	Weekly	Total and dissolved (TSS filter)
pH	-	Weekly	Field measurement
Temperature	-	Weekly	Field measurement
Calcium	EPA 200.7	Weekly	Total and dissolved (TSS filter)
TDS	SM 2540C	Monthly	
Metals via ICP *(on suspended solids)*	EPA 6010B	Quarterly	Ca, Mg, Na, K, Fe, Si, Al; Trussell Tech to separate solids via centrifugation
Orthophosphate	SM 4500P E	Quarterly	Total and dissolved (TSS filter)
Particulate Organic Carbon (POC)	EPA 9060	Quarterly	Trussell Tech to separate solids via centrifugation
Dissolved Organic Carbon (DOC)	SM 5310B	Quarterly	Using TSS filter paper substitution
X-ray diffraction (XRD)	XRD	Quarterly	Provides mineral characterization
Scanning electron microscopy (SEM) with energy dispersive x-ray spectroscopy (EDX)	SEM/EDX	Quarterly	Provides elemental characterization
Thermogravimetric analysis (TGA)	TGA	Quarterly	Provides cellulose identification and quantification

Dischargers

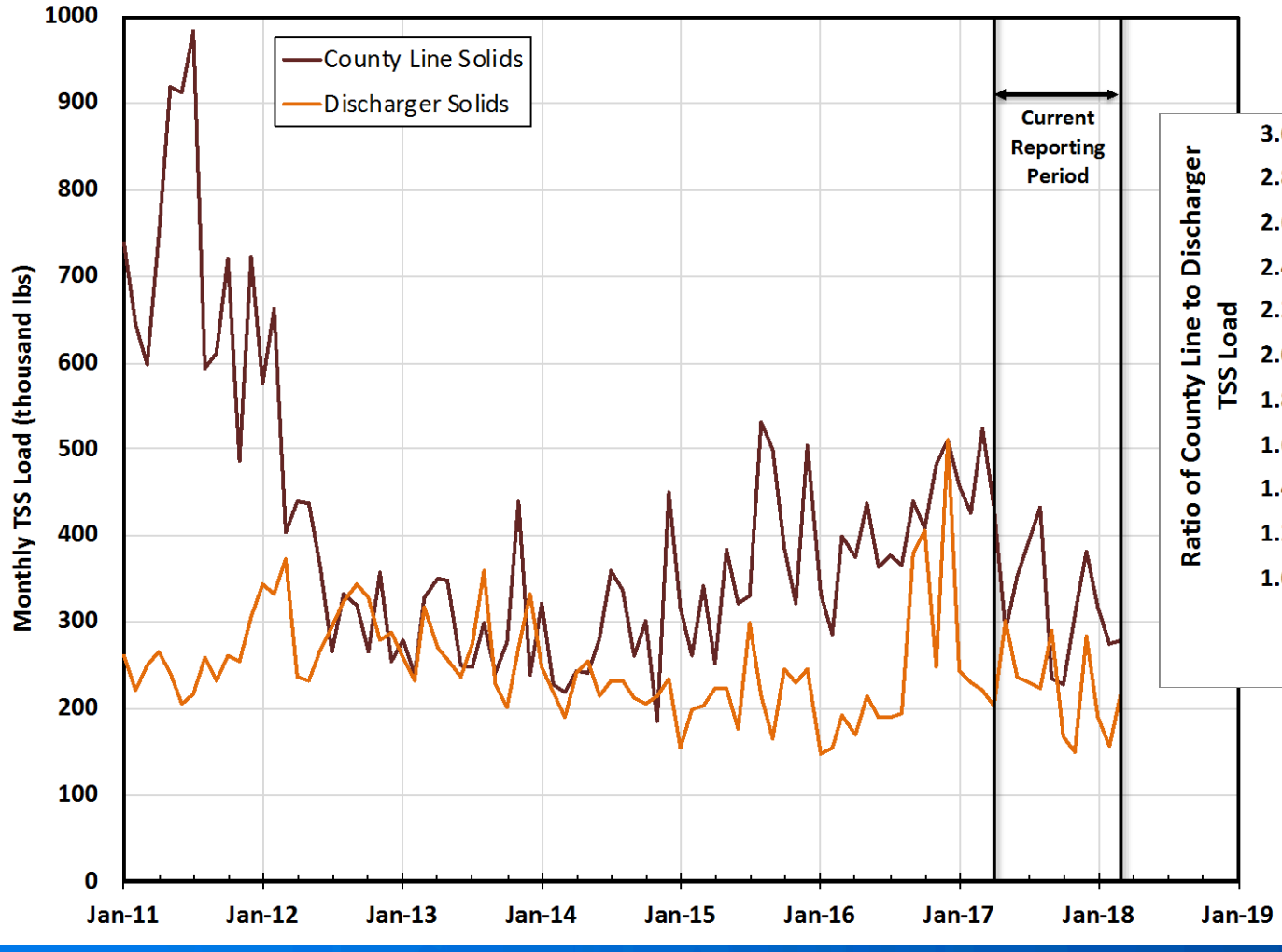
Flow Rank	Industrial Discharger	TSS	VSS	BOD		Calcium		Alkalinity	
				Total	*Dissolved*	*Total*	*Dissolved*	*Total*	*Dissolved*
1	Chino I Desalter	M	M	M	M	M	M	M	M
2	Perris & Menifee Desalter	M	M	M	M	M	M	M	M
3	Temescal Desalter	M	M	M	M	M	M	M	M
4	Chino II East Desalter	M	M	M	M	M	M	M	M
5	Arlington Desalter	M	M	M	M	M	M	M	M
6	JCSD-Etiwanda	M	M	M	M	M	M	M	M
7	Mountainview Power Plant	Q	Q	Q	Q	Q	Q	Q	Q
8	CDC Bonview	M	M	M	M	M	M	M	M
9	YVWD - Henry Wochholz Plant	Q	Q	Q	Q	Q	Q	Q	Q
10	California Institute for Women	M	M	M	M	M	M	M	M
11	Mission Linen	M	M	M	M	M	M	M	M
12	Stringfellow	Q	Q	Q	Q	Q	Q	Q	Q
13	California Institute for Men	Q	Q	Q	Q	Q	Q	Q	Q
14	Inland Empire Energy Center	Q	Q	Q	Q	Q	Q	Q	Q
15	Inland Bionergy	M	M	M	M	M	M	M	M
16	JCSD-Wineville	M	M	M	M	M	M	M	M
17	Chino II West Desalter	Q	Q	Q	Q	Q	Q	Q	Q
18	OLS Energy	Q	Q	Q	Q	Q	Q	Q	Q
19	WRCRWA	M	M	M	M	M	M	M	M
20	Corona Energy Partners	Q	Q	Q	Q	Q	Q	Q	Q
21	JCSD-Hamner	M	M	M	M	M	M	M	M
22	Dairy Farmers of America	Q	Q	Q	Q	Q	Q	Q	Q
23	Dart Container	Q	Q	Q	Q	Q	Q	Q	Q
24	Repet	M	M	M	M	M	M	M	M
25	Wellington Foods	Q	Q	Q	Q	Q	Q	Q	Q
26	Rubidoux CSD	Q	Q	Q	Q	Q	Q	Q	Q
27	Temp Discharge	Q	Q	Q	Q	Q	Q	Q	Q
28	Frutarom Flavor Specialties	Q	Q	Q	Q	Q	Q	Q	Q
29	Green River Golf Course	Q	Q	Q	Q	Q	Q	Q	Q
30	Giuliano and Sons Briners	Q	Q	Q	Q	Q	Q	Q	Q
31	Agua Mansa Power Plant	Q	Q	Q	Q	Q	Q	Q	Q

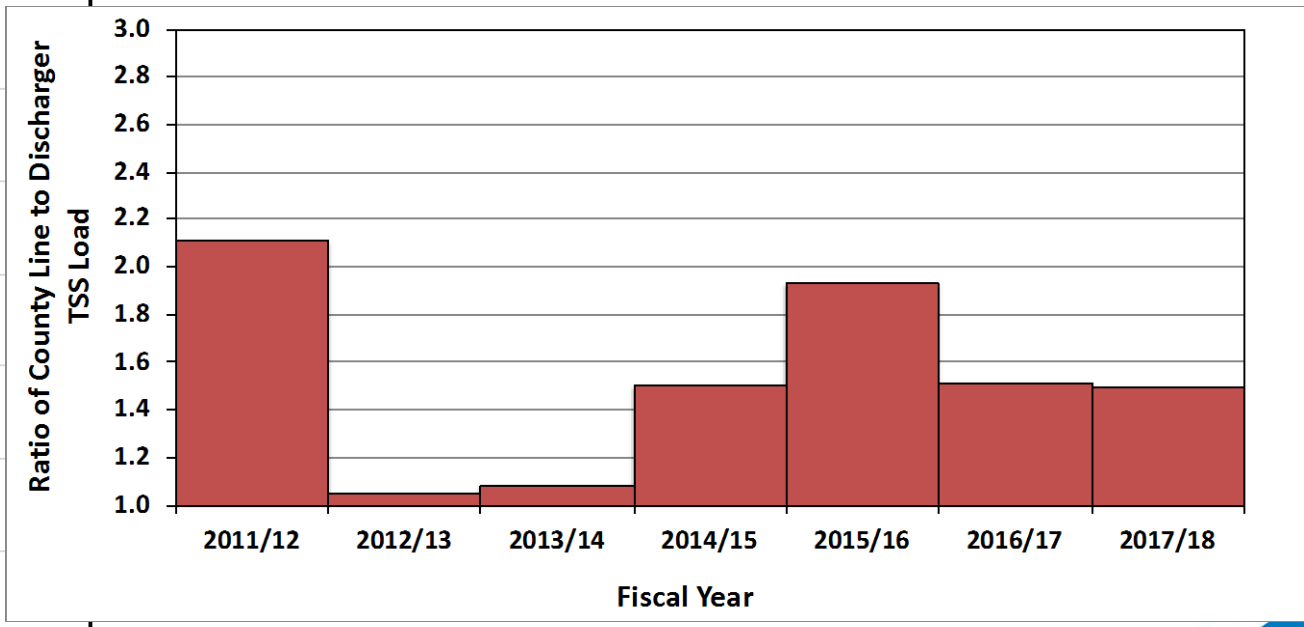
Methodology (2016 data)

SS Out: County Line - **SS In: Combined Dischargers** = **SS Formed**



Solids Difference in Brine Line

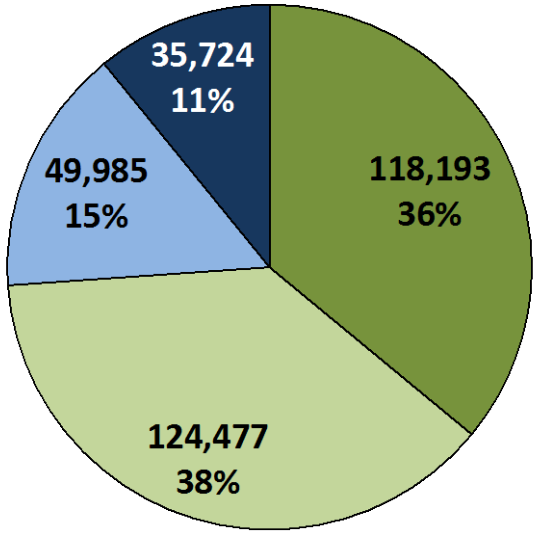




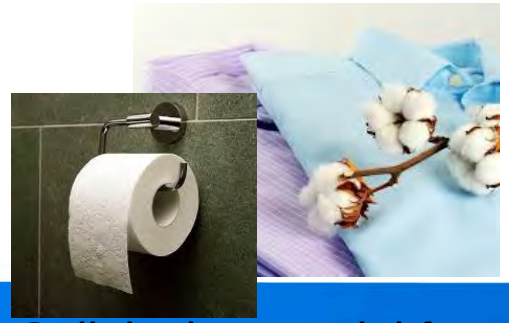
*Values represent monthly average loading. When no monitoring occurred for an individual discharger in a given month, surrounding average measurements were substituted.

County Line SS

Bacteria
(dead & alive)

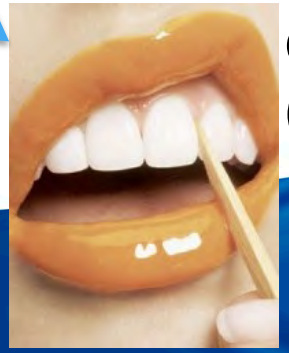


Calcium carbonate
(scale at bottom of teapot)



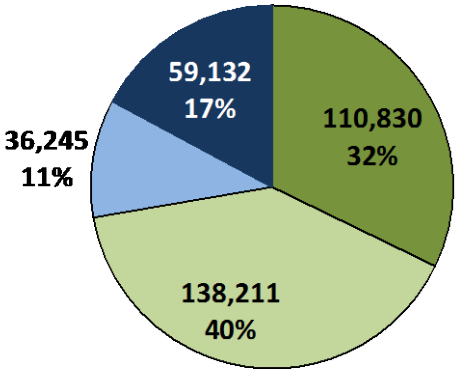
Cellulosic material from plant fibers
(paper products, cotton fabrics)

Non-calcium inorganics
(silica, aluminum, etc.)

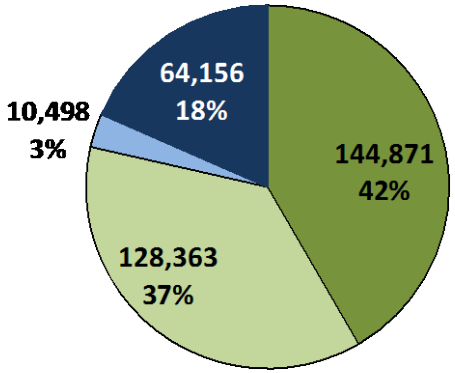


Calcium phosphate
(in teeth)

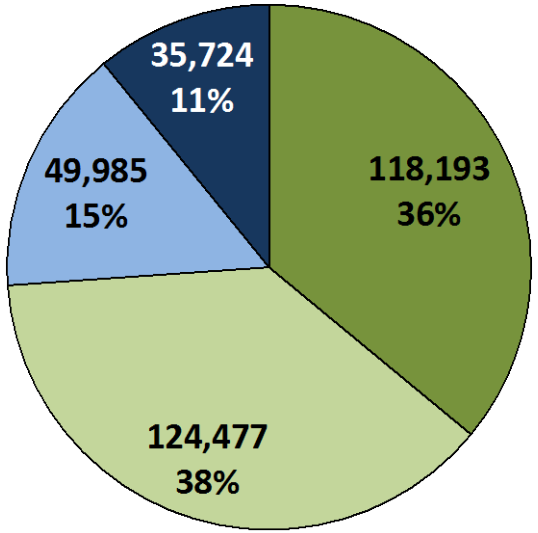
County Line SS



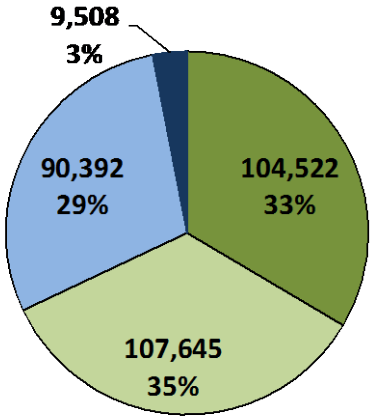
Q2: Sept 12, 2017
344,400 lbs/month



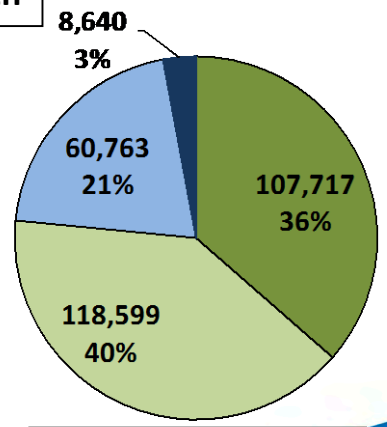
Q1: May 31, 2017
347,900 lbs/month



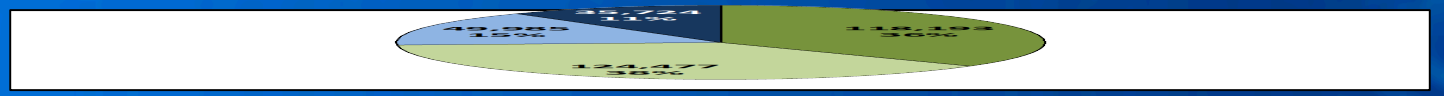
Annual Average
April 2017 – March 2018
328,400 lbs/month



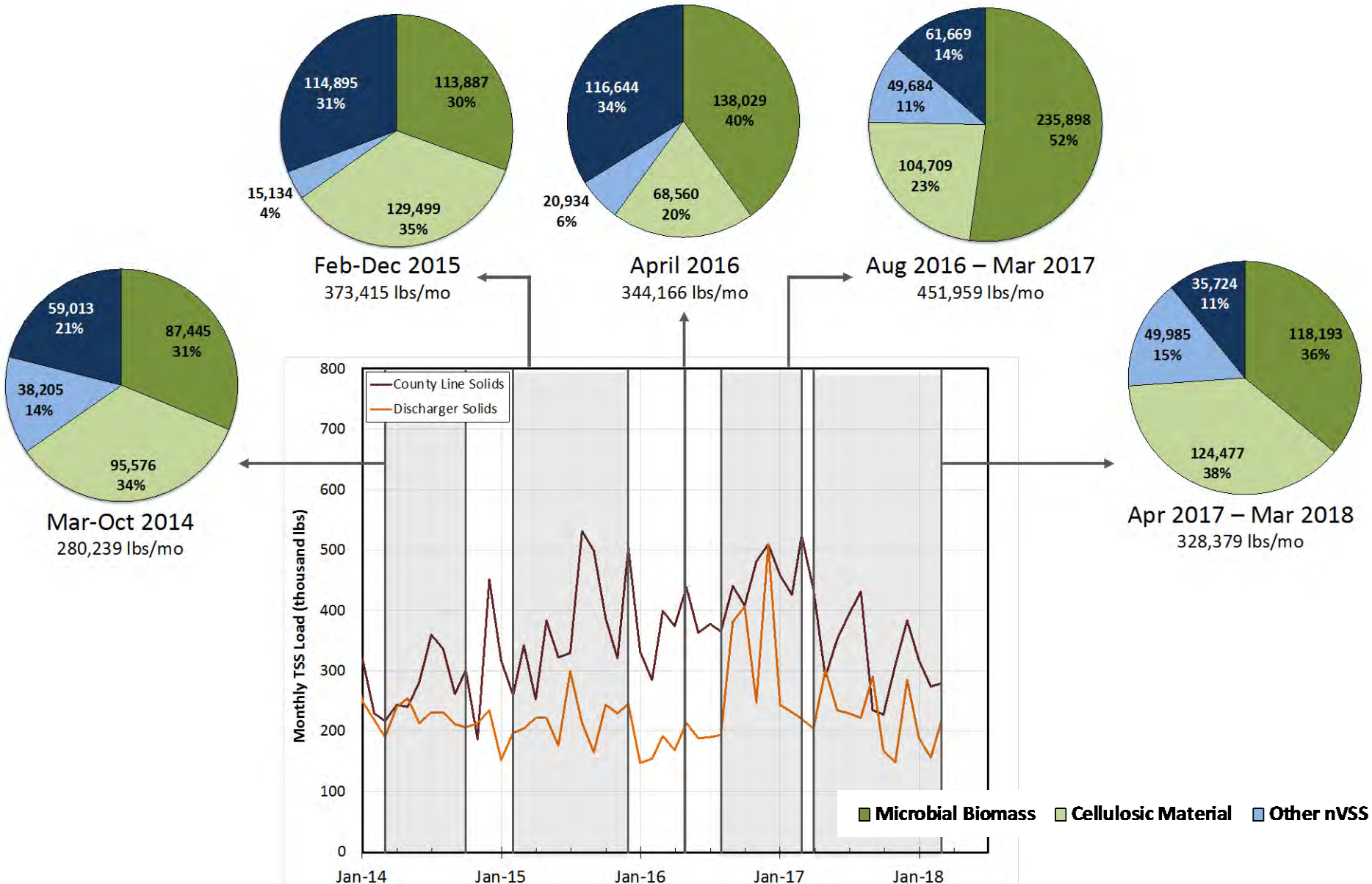
Q3: Dec 5, 2017
312,000 lbs/month



Q4: Feb 27, 2018
295,700 lbs/month

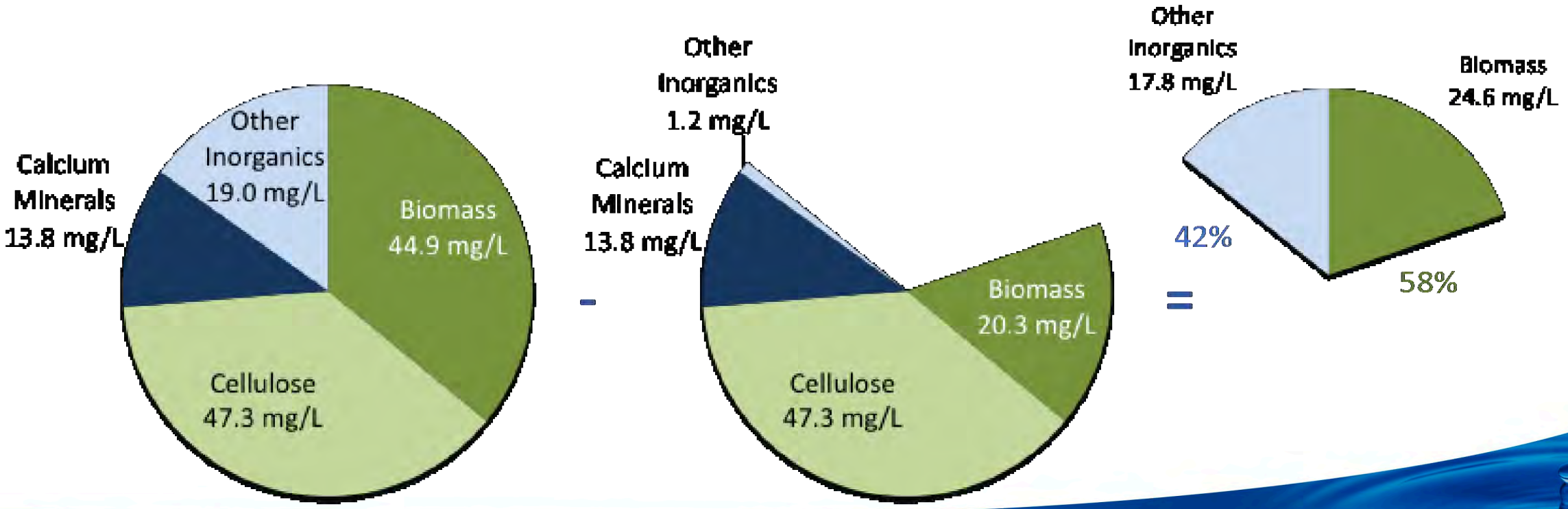


County Line SS



Methodology (2018 data)

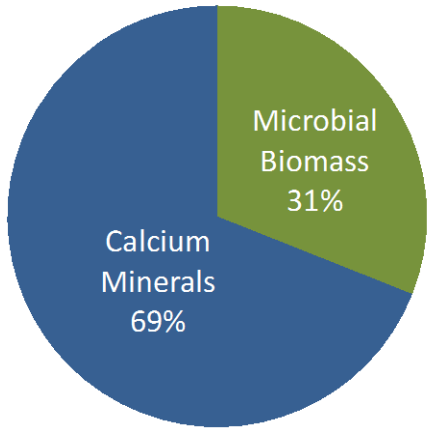
SS Out: County Line **-** **SS In: Combined Dischargers** **=** **SS Formed**



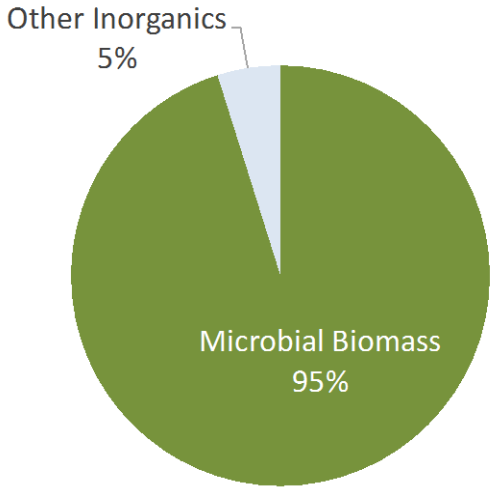
Solids Formation Characterization

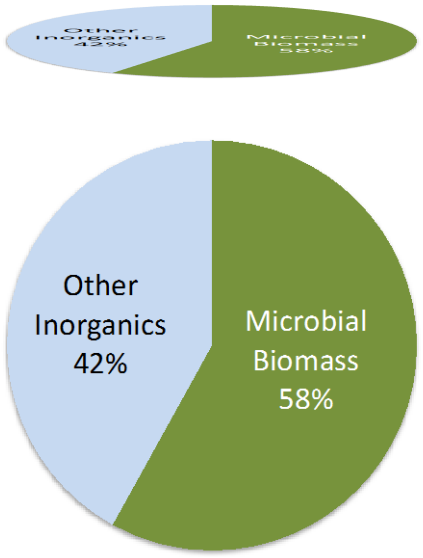
Component	Percent of Total Suspended Solids			Cost Allocation Parameter
	April 2016	August 2016 - March 2017	April 2017 - March 2018	
Microbial Biomass	31%	95%	58%	Dissolved BOD5
Calcium Minerals	69%	0%	0%	Dissolved Calcium (40%) Alkalinity (60%)
Other Inorganics	0%	5%	42%	Flow-based "service charge"
Total	**100%**	**100%**	**100%**	

April 2016



August 2016 – March 2017





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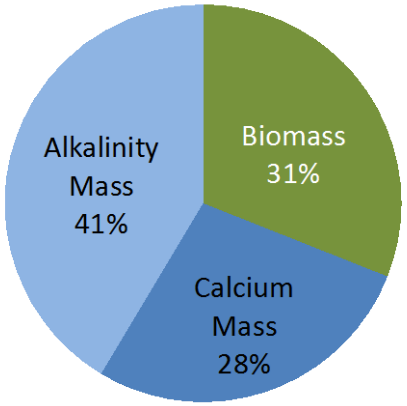
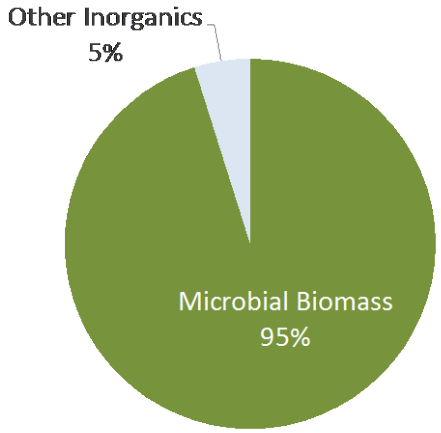
Total	**100%**	**100%**	**100%**	

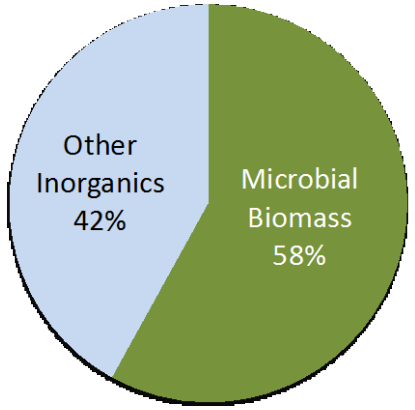
April 2016



August 2016 – March 2017



April 2017 – March 2018



Findings

- Brine Line suspended solids decreased
- Shift in composition of solids observed at the County Line, though inconsistent throughout the year
- Monitoring of dischargers can be improved for characterization of particulate inputs
- Decrease in Brine Line suspended solids formation

Brine Line Changes

- DFA & CEP facilities shut down – January 2018
- Chino II Concentrate Reduction Facility (CRF) active – February 2018
- Inland Bioenergy stopped discharging to Brine Line – August 2017-August 2018
- Lewis Homes (Bonview) diverted flows to IEUA Regional Plant – August 2018

Next Steps

- Implement a few changes to monitoring program
  - Monthly solids characterization at County Line
  - Paired sampling of total and dissolved parameters for dischargers
- In light of system changes and monitoring data issues, collect data through March 2019 and revisit billing formula for FY 2019/20

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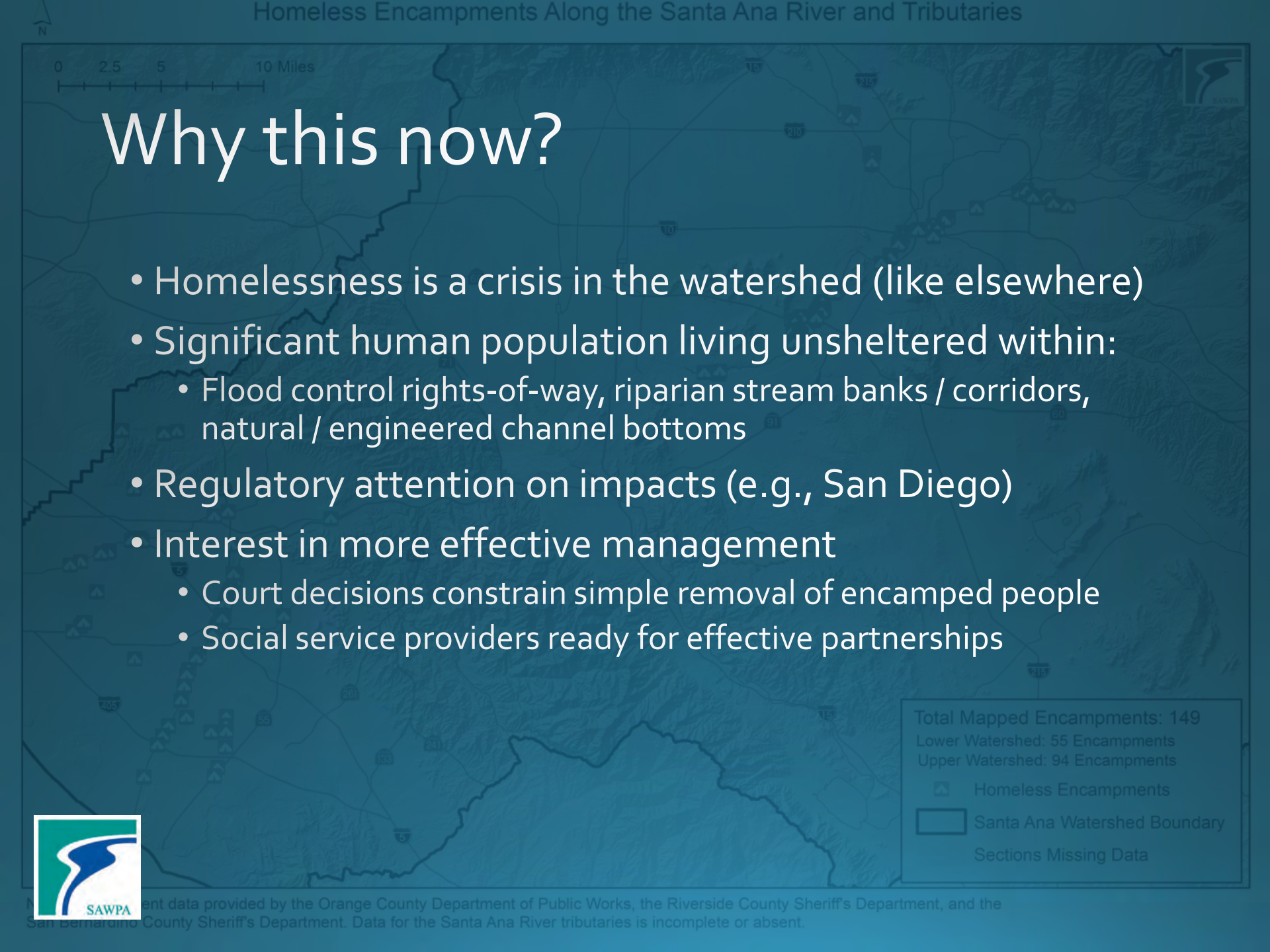
Assessing homelessness impacts on water quality, riparian and aquatic habitat in upper Santa Ana River watershed

SAWPA Commission – November 6, 2018

As directed:

- During consideration of the now-adopted MOU between SAWPA and the Housing Authority of the City of Riverside.
- The minutes of the May 15, 2018 describe the direction given to staff by the SAWPA Commission:

"Provide as promptly as possible… recommendations to the Commission for a technical study on the water quality, habitat, flood control and other operational impacts of homeless encampments on the Santa Ana River, to include scope, cost, timeline, etc."

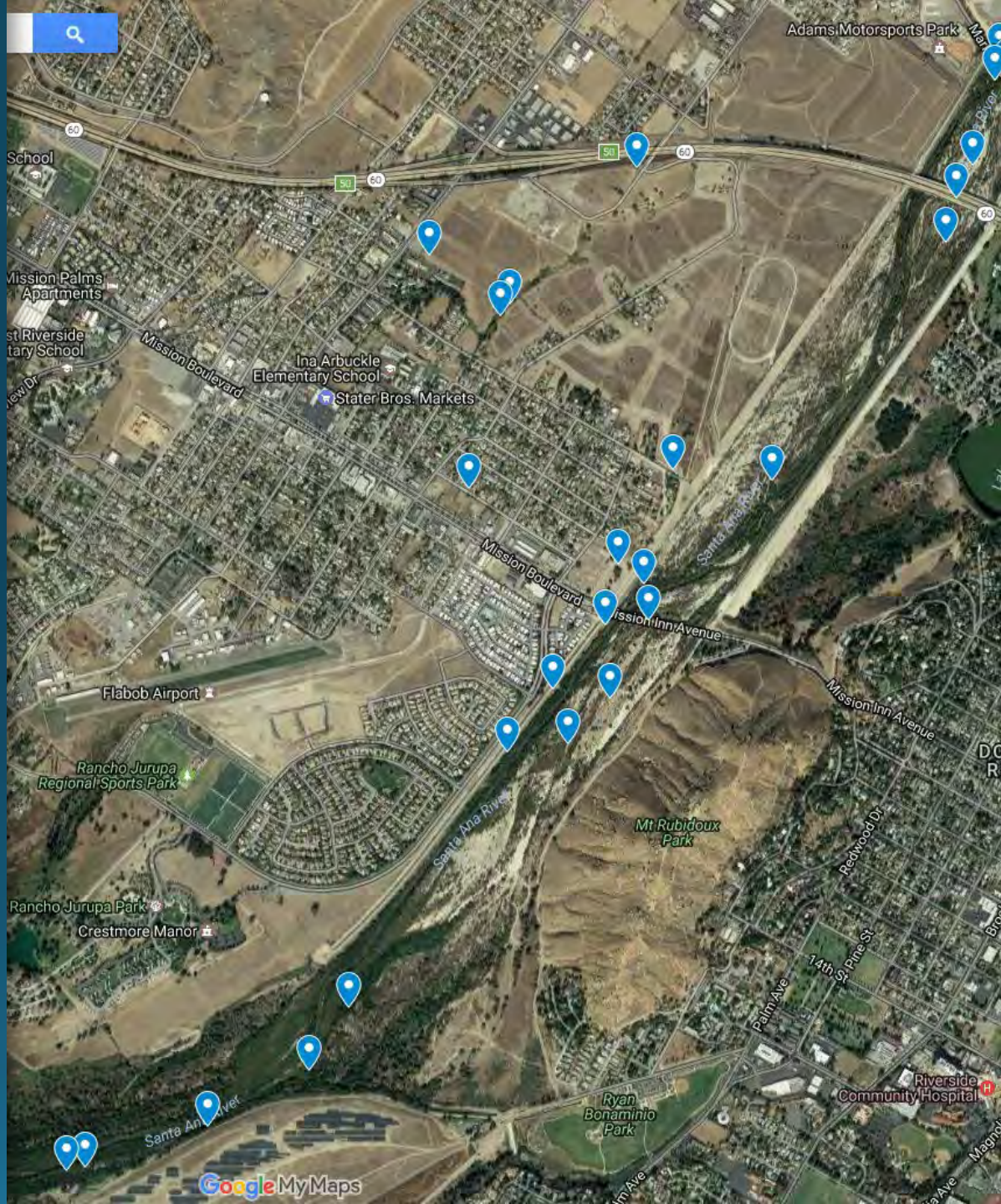


Why this now?

- Homelessness is a crisis in the watershed (like elsewhere)
- Significant human population living unsheltered within:
  - Flood control rights-of-way, riparian stream banks / corridors, natural / engineered channel bottoms
- Regulatory attention on impacts (e.g., San Diego)
- Interest in more effective management
  - Court decisions constrain simple removal of encamped people
  - Social service providers ready for effective partnerships

Is a new approach called for?

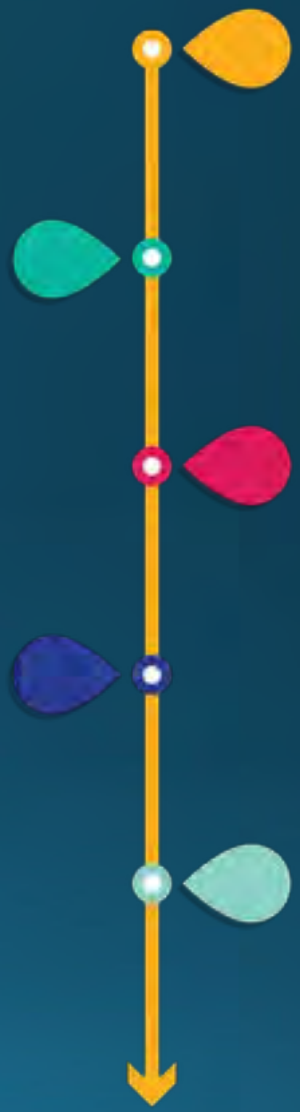
- Simple eviction of encampments is not effective long-term for water quality improvements
- Simple eviction of encampments now not permitted by the Courts
- What is the appropriate role for agencies with water quality and / or habitat quality responsibilities?



Timeline

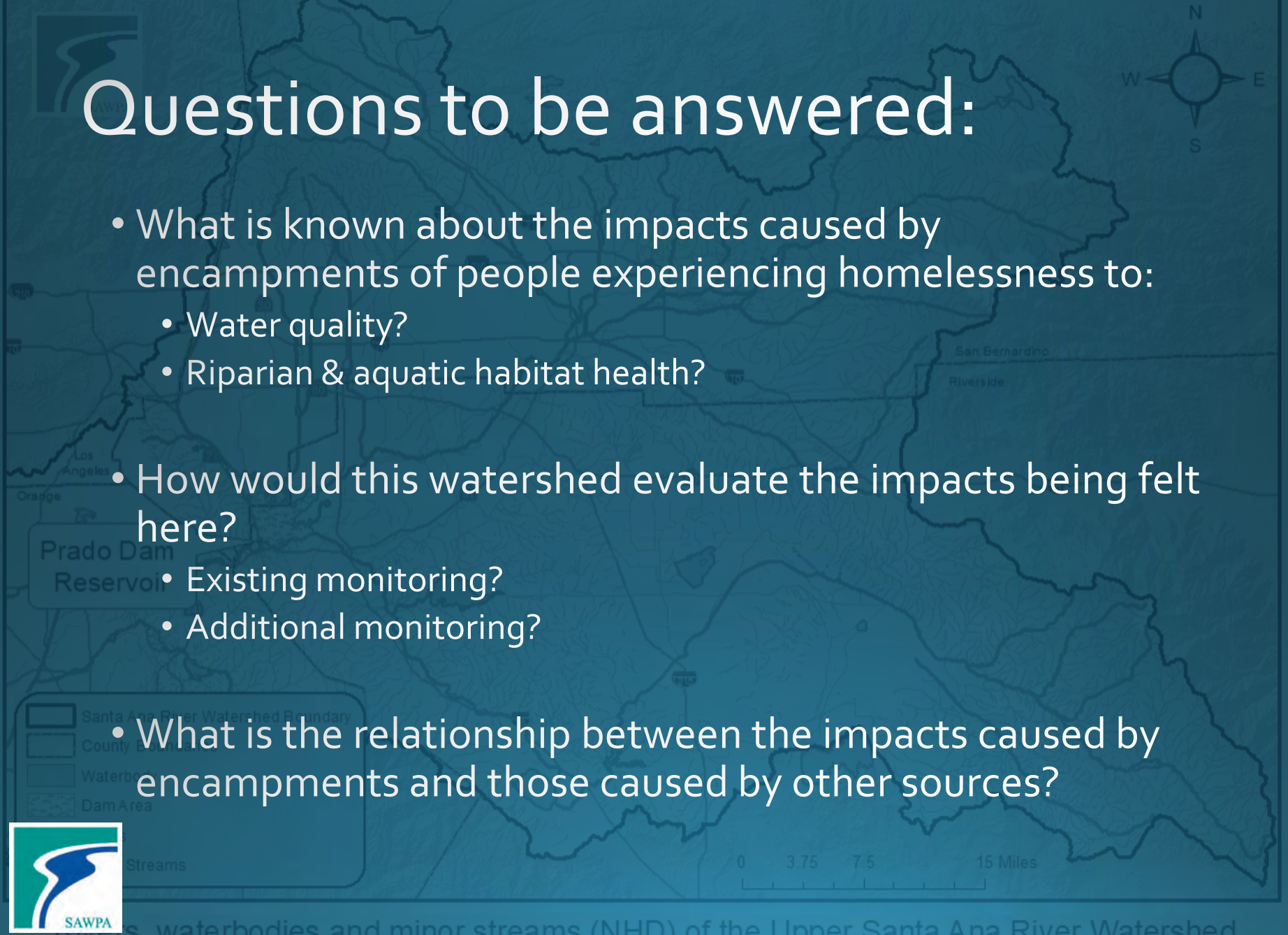
- RFP developed over several months by
  - Member agency staff
  - SAWPA staff
  - Several GM meetings
  - Direct edits by several of the GMs

- If a firm is selected in January, a maximum one year scope is expected



Questions to be answered:

- What is known about the impacts caused by encampments of people experiencing homelessness to:
  - Water quality?
  - Riparian & aquatic habitat health?
- How would this watershed evaluate the impacts being felt here?
  - Existing monitoring?
  - Additional monitoring?
- What is the relationship between the impacts caused by encampments and those caused by other sources?



Rivers, waterbodies and minor streams (NHD) of the Upper Santa Ana River Watershed

Recommendations

That the SAWPA Commission…

…direct staff to release a Request for Proposals (RFP) to receive proposals from qualified firms for assessing the water quality, riparian and aquatic habitat impacts of homelessness in the upper Santa Ana River Watershed, and to provide to the Commission a selected qualified firm for consideration of contract award on January 15, 2019.

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Santa Ana Sucker Habitat Protection and Beneficial Use Enhancement Project

Ian Achimore
Senior Watershed Manager

SAWPA

Construction Overview

Construction Activities

- 15 foot groin
- 2 boulders clusters
- Access road

Construction Budget

- Approved budget of $118K
- Actual costs of $80K
- Cost savings of $40K ($120K compared to contractor bid)

Constructed Habitat Features

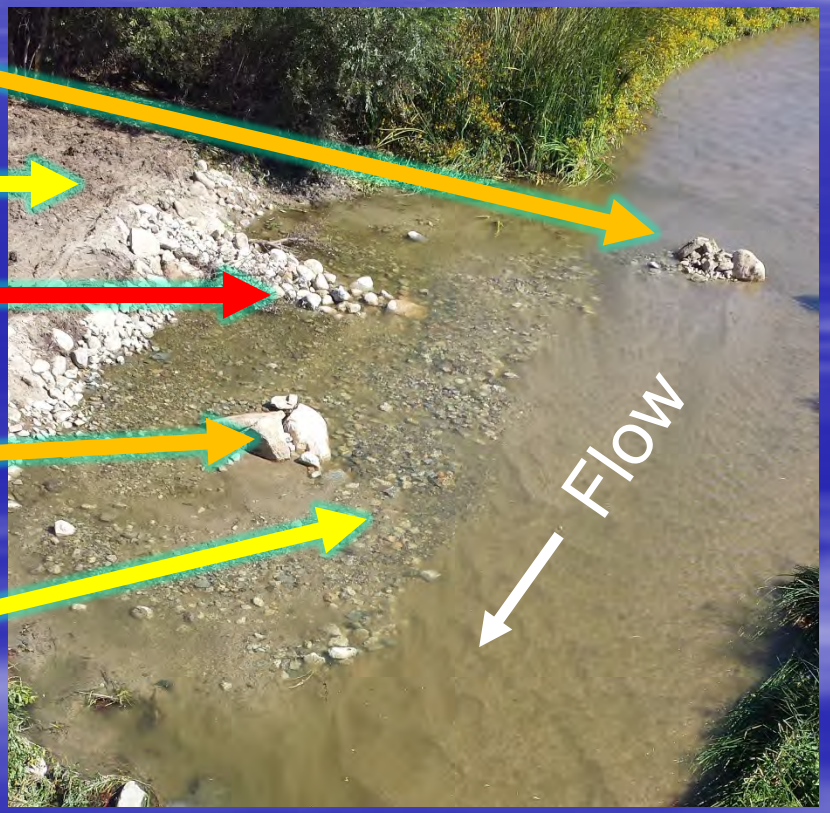
Upstream Boulder Cluster

Cleared Vegetation

Groin

Downstream Boulder Cluster

Cobble



Upstream View – Pre Project

Upstream View – Post Project

Bank View – Pre Project

Bank View – Post Project

Eight Work Day Construction Timeline

- Oct 3-4: Vegetation Removal
- Oct 8: Road Grading
- Oct 9-10: Rock Delivery
- Oct 10-12: Berm Creation and Rock Placement
- Oct 12: Final Rock Placement and Grading

Storm Event – October 12 to 13

- Flows reached a peak of 1,300 cubic feet per second
- Structure performed well – outer end of groin not covered
- Structure designed for up to 2,500 cubic feet per second

Next Steps

- Use existing funds to maintain the Project; add rock as necessary.
- Maintain the re-planted vegetation in the Project area
- Monitor and report to funding partners
- Present at Santa Ana River Science Symposium

Thanks For Your Support

- Project Partner Orange County Water District
- San Bernardino Valley Municipal Water District
- SAWPA Engineering, Operations and Administrative Departments