UNION SANITARY DISTRICT

BOARD MEETING AGENDA
Monday, February 27, 2017
Regular Meeting - 7:00 P.M.

Union Sanitary District
Administration Building
5072 Benson Road
Union City, CA 94587

	1.	Call to Order.
	2.	Pledge of Allegiance.
	3.	Roll Call.
Motion	4.	Approve Minutes of the Meeting of February 13, 2017.
Information	5.	Balanced Scorecard *(to be reviewed by the Legal/Community Affairs Committee).* a. Second Quarter FY 17 District-wide Balanced Scorecard Measures. b. Balanced Scorecard Report for the Treatment and Disposal Services and Fabrication, Maintenance, and Construction Work Groups.
	6.	Written Communications.
	7.	Oral Communications. *The public may provide oral comments at regular and special Board meetings; however, whenever possible, written statements are preferred **(to be received at the Union Sanitary District office at least one working day prior to the meeting**). This portion of the agenda is where a member of the public may address and ask questions of the Board relating to any matter within the Board's jurisdiction that is not on the agenda. If the subject relates to an agenda item, the speaker should address the Board at the time the item is considered. Oral comments are limited to three minutes per individuals, with a maximum of 30 minutes per subject. Speaker's cards will be available in the Boardroom and are to be completed prior to discussion.*
Information	8.	Check Register.
Information	9.	California Association of Sanitation Agencies (CASA) Winter 2017 Conference.
Information	10.	Publication of Intematix Corporation as Significant Violator in 2016 *(to be reviewed by the Legal/Community Affairs Committee).*
Information	11.	Receive and File the June 30, 2015 CalPERS Actuarial Report *(to be reviewed by the Budget & Finance Committee).*
Information	12.	Report on the East Bay Dischargers Authority (EBDA) Meeting of February 16, 2017.

Information 13. Committee Meeting Reports. *(No Board action is taken at Committee meetings):*

a. Budget & Finance Committee – Wednesday, February 22, 2017, at 3:00 p.m.
    - Director Fernandez and Director Lathi
b. Legal/Community Affairs Committee – Thursday, February 23, 2017, at 12:30 p.m.
    - Director Fernandez and Director Lathi
c. Engineering and Information Technology Committee – will not meet.
d. Audit Committee – will not meet.
e. Legislative Committee – will not meet.
f. Personnel Committee – will not meet.
g. Ad Hoc Subcommittee for Communications Strategy.

Information 14. General Manager's Report. *(Information on recent issues of interest to the Board).*

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15. Other Business:

a. Comments and questions. *Directors can share information relating to District business and are welcome to request information from staff.*
b. Scheduling matters for future consideration.

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16. Adjournment – The Board will adjourn to the Mid-Year Budget Board Workshop in the Boardroom on Monday, March 6, 2017, at 5:30 p.m.

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17. Adjournment – The Board will adjourn to the next Regular Meeting in the Boardroom on Monday, March 13, 2017, at 7:00 p.m.

The Public may provide oral comments at regular and special Board meetings; however, whenever possible, written statements are preferred (to be received at the Union Sanitary District at least one working day prior to the meeting).
If the subject relates to an agenda item, the speaker should address the Board at the time the item is considered. If the subject is within the Board's jurisdiction but not on the agenda, the speaker will be heard at the time "Oral Communications" is calendared. Oral comments are limited to three minutes per individual, with a maximum of 30 minutes per subject. Speaker's cards will be available in the Boardroom and are to be completed prior to discussion of the agenda item.

The facilities at the District Offices are wheelchair accessible. Any attendee requiring special accommodations at the meeting should contact the General Manager's office at (510) 477-7503 at least 24 hours in advance of the meeting.

THE PUBLIC IS INVITED TO ATTEND

BUDGET & FINANCE COMMITTEE MEETING

Committee Members: Director Fernandez and Director Lathi

AGENDA
Wednesday, February 22, 2017
3:00 P.M.

Alvarado Conference Room
5072 Benson Road
Union City, CA 94587

1. Call to Order

2. Roll Call

3. Public Comment

4. Items to be reviewed for the Board meeting of February 27, 2017:
   - Receive and File the June 30, 2015 CalPERS Actuarial Report.

5. Adjournment

Items reviewed at committee meetings will be included in the agenda packet for the upcoming Board meeting. No action will be taken at committee meetings.

The Public may provide oral comments at regular and special Board meetings; however, whenever possible, written statements are preferred (to be received at the Union Sanitary District at least one working day prior to the meeting).

If the subject relates to an agenda item, the speaker should address the Board at the time the item is considered. If the subject is within the Board's jurisdiction but not on the agenda, the speaker will be heard at the time "Public Comment" is calendared. Oral comments are limited to three minutes per individual, with a maximum of 30 minutes per subject. Speaker's cards will be available and are to be completed prior to discussion of the agenda item.

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THE PUBLIC IS INVITED TO ATTEND

UNION SANITARY DISTRICT

Directors
Manny Fernandez
Tom Handley
Pat Kite
Anjali Lathi
Jennifer Toy

Officers
Paul R. Eldredge
General Manager/ District Engineer

Karen W. Murphy
Attorney

LEGAL/COMMUNITY AFFAIRS COMMITTEE MEETING

Committee Members: Director Fernandez and Director Lathi

AGENDA
Thursday, February 23, 2017
12:30 P.M.

Alvarado Conference Room
5072 Benson Road
Union City, CA 94587

1. Call to Order

2. Roll Call

3. Public Comment

4. Items to be reviewed for the Board meeting of February 27, 2017:
   - Second Quarter FY 17 District-wide Balanced Scorecard Measures.
   - Balanced Scorecard Report for the Treatment and Disposal Services and Fabrication, Maintenance, and Construction Work Groups.
   - Publication of Intematix Corporation as Significant Violator in 2016.

5. Adjournment

Items reviewed at committee meetings will be included in the agenda packet for the upcoming Board meeting. No action will be taken at committee meetings.

The Public may provide oral comments at regular and special Board meetings; however, whenever possible, written statements are preferred (to be received at the Union Sanitary District at least one working day prior to the meeting).

If the subject relates to an agenda item, the speaker should address the Board at the time the item is considered. If the subject is within the Board's jurisdiction but not on the agenda, the speaker will be heard at the time "Public Comment" is calendared. Oral comments are limited to three minutes per individual, with a maximum of 30 minutes per subject. Speaker's cards will be available and are to be completed prior to discussion of the agenda item.

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THE PUBLIC IS INVITED TO ATTEND

**MINUTES OF THE MEETING OF THE
BOARD OF DIRECTORS OF
UNION SANITARY DISTRICT
February 13, 2017**

CALL TO ORDER

Vice President Kite called the meeting to order at 7:00 p.m.

PLEDGE OF ALLEGIANCE

ROLL CALL

PRESENT: Pat Kite, Vice President
Anjali Lathi, Secretary
Manny Fernandez, Director
Jennifer Toy, Director

ABSENT: Tom Handley, President

STAFF: Paul Eldredge, General Manager
Karen Murphy, District Counsel
Sami Ghossain, Technical Services Manager
James Schofield, Collection Services Manager
Armando Lopez, Treatment and Disposal Services Manager
Pamela Arends-King, Business Services Manager/CFO
Robert Simonich, Fabrication, Maintenance, and Construction Manager
Karoline Terrazas, Training & Emergency Response Programs Manager
Regina McEvoy, Executive Assistant to the General Manager/Board Clerk

APPROVAL OF THE MINUTES OF THE MEETING OF JANUARY 23, 2017

It was moved by Director Toy, seconded by Director Fernandez, to approve the Minutes of the Meeting of January 23, 2017. Motion carried with the following vote:

AYES: Fernandez, Kite, Toy
NOES: None
ABSENT: Handley
ABSTAIN: Lathi

APPROVAL OF THE MINUTES OF THE SPECIAL MEETING OF JANUARY 31, 2017

It was moved by Director Fernandez, seconded by Secretary Lathi, to approve the Minutes of the Special Meeting of January 31, 2017. Motion carried with the following vote:

AYES: Fernandez, Kite, Lathi, Toy
NOES: None
ABSENT: Handley
ABSTAIN: None

MONTHLY OPERATIONS REPORT FOR DECEMBER 2016

This item was reviewed by the Legal/Community Affairs and Budget & Finance Committees. General Manager Eldredge reported the following:

- Odor Complaints: There was one odor complaint received by Collection Services, and one odor complaint received by the Treatment Plant in December 2016. Details regarding the complaints were included in the Board meeting packet.
- The Cogen system produced 77% of power consumed for the month of December 2016.

Business Services Manager/CFO Arends- King reported the following:

- Revenues:
    - Received $26.2 Million in Sewer Service Charges.
    - Received $1.6 Million in capacity fees during the month of December of which $1.2 Million was received from Cityview Bay Area Fund for Windflower Lofts, and $250,000 was received from KB Homes.
- Expenses:
    - Expenses for all Work Groups were at or below budget.

General Manager Eldredge stated Monthly Operations Reports for each work group were included in the Board meeting packet.

WRITTEN COMMUNICATIONS

There were no written communications.

ORAL COMMUNICATIONS

There were no oral communications.

CONSIDER A RESOLUTION TO ACCEPT THE CONSTRUCTION OF THE MCC AND PLC REPLACEMENT PROJECT – PHASE 3 FROM D.W. NICHOLSON CORPORATION AND AUTHORIZE RECORDATION OF A NOTICE OF COMPLETION

This item was reviewed by the Engineering and Information Technology Committee. Technical Services Manager Ghossain stated the project included replacement of existing motor control center's (MCC's), PLC's, and associated equipment at the Degritter Building, West Aeration Blower Building, and Main Electrical Distribution Building. D.W. Nicholson substantially completed the Project on December 9, 2016, and the District has assumed beneficial use of the Project. Staff recommended the Board accept the construction of the MCC and PLC Replacement Project – Phase 3 from D.W. Nicholson Corporation, and authorize recordation of a Notice of Completion.

It was moved by Director Toy, seconded by Director Fernandez, to Adopt Resolution No. 2800 Accepting Construction of the MCC and PLC Replacement Project – Phase 3 Located in the City of Union City, California from D.W. Nicholson Corporation, and Authorize Recordation of a Notice of Completion. Motion carried with the following vote:

AYES:	Fernandez, Kite, Lathi, Toy
NOES:	None
ABSENT:	Handley
ABSTAIN:	None

CONSIDER A RESOLUTION APPROVING AN AGREEMENT FOR UNION SANITARY DISTRICT PARTICIPATION IN THE ALAMEDA COUNTY OPERATIONAL AREA EMERGENCY MANAGEMENT ORGANIZATION

This item was reviewed by the Legal/Community Affairs Committee. Training & Emergency Response Programs Manager Terrazas presented the resolution as a desk item. The Union Sanitary District Board of Directors previously entered into an agreement to participate in the Alameda County Operational Area Emergency Management Organization by adopting Resolution No. 2144 on June 12, 1995. The Alameda County Operational Area is an intermediate level of the state emergency services organization which includes the County and all political subdivisions within the County area. The Agreement will coordinate facilities and personnel throughout the County to efficiently and effectively establish tasks, policies, and general procedures using the Standard Emergency Management System to provide for effective and economical allocation of resources. Staff recommended the Board adopt a resolution approving Union Sanitary District participation in the Alameda County Emergency Operations Area Emergency Management Organization.

It was moved by Secretary Lathi, seconded by Director Fernandez, to Adopt Resolution No. 2801 Approving an Agreement for Participation in the Alameda County Operational Area Emergency Management Organization. Motion carried with the following vote:

AYES:	Fernandez, Kite, Lathi, Toy
NOES:	None
ABSENT:	Handley
ABSTAIN:	None

REVIEW AND CONSIDER APPROVAL OF POLICY NO. 2030, INVESTMENT POLICY

This item was reviewed by the Budget & Finance Committee. Business Services Manager/CFO Arends-King stated Policy No. 2030, Investment Policy, requires annual Board review and approval. There were no changes to California Government Code Section 53600 through 53622, therefore, the only change to the proposed Policy for calendar year 2017 was the effective date. Staff recommended the Board review and consider approval of Investment Policy No. 2030 and renew delegation of authority of Treasurer to the Business Services Manager/Chief Financial Officer for a one-year period, per California Government Code Section 53607.

It was moved by Secretary Lathi, seconded by Director Toy, to Approve Policy No. 2030, Investment Policy, and Renew the Delegation of Authority of Treasurer to the Business Services Manager/Chief Financial Officer for a one-year period, per California Government Code Section 53607. Motion carried with the following vote:

AYES:	Fernandez, Kite, Lathi, Toy
NOES:	None
ABSENT:	Handley
ABSTAIN:	None

INFORMATION ITEMS:

Check Register
All questions were answered to the Board's satisfaction.

Solar and Cogeneration Facilities Operational Update
This item was reviewed by the Budget & Finance Committee. Technical Services Manager Ghossain stated the total benefit to date for the Alvarado Wastewater Treatment Plant Solar Carport, constructed in 2011, was $497,160 for a 56.2% simple payback. The total benefit to date for the Irvington Pump Station Solar Facility, constructed in 2012, was $2,000,204 for a 70.2 % simple payback. The total benefit to date for the Cogeneration Facility, constructed in 2014, was $ 4,133,626 for a 34.3 % simple payback. Technical Services Manager Ghossain stated the Budget & Finance Committee requested the Solar and Cogeneration Facilities Operational Data table included in the Board meeting packet be updated to include a column to show the original payback period when the next update is presented in July 2017.

Cal-Card Quarterly Merchant Activity Report
This item was reviewed by the Budget & Finance Committee. Business Services Manager/CFO Arends-King stated the CAL-Card Merchant Spend Analysis included in the Board meeting packet details activity for the second quarter of FY 2017, which included 255 transactions totaling $74,843.60

Report on the East Bay Dischargers Authority (EBDA) Meeting of January 12, 2017
Director Toy provided an overview of the EBDA Commission minutes included in the Board meeting packet.

COMMITTEE MEETING REPORTS:
The Budget & Finance Committee meeting was canceled due to a lack of quorum, and individual briefings were conducted. The Engineering and Information Technology and Legal/Community Affairs Committees met.

GENERAL MANAGER'S REPORT:

General Manager Eldredge reported the following:

- Flows during recent wet weather events resulted in peak flows in the low 40's MGD, and low flows have been 3-4 MGD higher than usual. The Plant's typical low flow had been 6-7 MGD, and had recently been averaging 11-12 MGD.
- The City of Newark State of the City will be held April 13, 2017, and registration will open February 23, 2017.
- PG&E staff will present a California Performance Optimization Program check at the March 13, 2017, Board meeting.

OTHER BUSINESS:

Secretary Lathi stated she attended the recent Alameda County Water District public hearing regarding proposed rate increases.

ADJOURNMENT:

The meeting was adjourned at 7:33 p.m. to the next scheduled Regular Board Meeting to be held in the Boardroom on Monday, February 27, 2017, at 7:00 p.m.

SUBMITTED: ATTEST:

REGINA McEVOY
BOARD CLERK

ANJALI LATHI
SECRETARY

APPROVED:

TOM HANDLEY
PRESIDENT

Adopted this 27th day of February, 2017

Directors
Manny Fernandez
Tom Handley
Pat Kite
Anjali Lathi
Jennifer Toy

Officers
Paul R. Eldredge
General Manager/ District Engineer

Karen W. Murphy
Attorney

DATE: February 21, 2017

MEMO TO: Board of Directors - Union Sanitary District

FROM: Paul R. Eldredge, General Manager/District Engineer
Pamela Arends-King, Business Services Manager
Laurie Brenner, (Acting) Organizational Performance Program Manager

SUBJECT: Agenda Item No. 5a - Meeting of February 27, 2017
Information Item: **Second Quarter FY 17 District-Wide Balanced Scorecard Measures**

Recommendation:
Information Only.

Background:
This report summarizes progress meeting the District's strategic objectives for the second quarter of fiscal year 2016-17 (October 1 through December 31, 2016).

Safety
The District performed well overall in meeting published safety measures in the second quarter, with no additional reportable accidents incurred. No best management practice site visits were made, however, the number of major safety training events offered has already exceeded the annual target, with eight events YTD against only seven originally planned. We continue to emphasize safety in all that we do.

See Table 1: Safety Objectives and Measures, for District performance against all safety measures in Q2.

Operational Excellence

The District also performed very well in meeting the Operational Excellence measures in Q2 of FY17. Only one measure in the scorecard missed published targets in Q2 of FY17- a single Category 1 Sanitary Sewer Overflow (SSO) occurred on November 18, 2016 in Newark (on Manzanita). This spill had the potential to impact the environment negatively, by definition, despite our 99% recovery rate of the (140/141 gallons) material spilled.

There were six recorded assessments completed for the "# Competency assessments…" measure in Collections Services (CS), with the annual target set at 68 for the year. The trend in recent years has been limited progress against the goal during the first half of the year, with concerted efforts in completing assessments tin the latter part of the fiscal year. This is not believed to be a material concern.

See Table 2: Operational Excellence Objectives and Measures, for District performance against all operational measures in Q2.

Legend for Table 1 and Table 2:

Green: meeting or exceeding target or projected to meet target by the end of the fiscal year
Yellow: Will not meet target if trend continues, and/or not meeting target by <10%- needs attention
Red: Will not meet FY target by >10%- corrective action needed

Table 1: **Safety Objectives and Measures**

Measures	Q2 FY17	FY17 Target	YTD	FY16	FY15	FY14	Comments
Total accidents with lost days	1	**0**	1	2	3	1	Ankle sprain resulting in lost days and continued care in Q1. No additional injuries in Q2
Other OSHA reportable accidents	0	**<4**	0	0	0	0	
# Incidents of vehicle or equipment accidents/damage	0	**<2**	1	3	3	4	Columbia cart door damaged; straightened internally by fleet mechanics
Cost associated with vehicle/equipment accidents	$0	**<$5000**	$0	$540	$444	$7,265	
Ave FTE lost time	0.09	**<0.5**	0.115	0.145	0.4875	0.05	
"Total Costs: Lost time wages only	$2,819.36	**≤$46,883**	$6,345.34	$9,883	$48,903.84	$4,897	
Ave FTE limited duty time	0	**≤0.5**	0	0.12	0.53	0	
"Total costs: Limited duty/Other ½ wages	$2,206.35	**≤$23,441**	$2,206.35	$4,775	$26,545.28	0	No loss of FTE time, but limited duty work was performed
X-Mod	0.72	**≤1.0**	0.72	1.01	1.16	0.95	Improved over last year; 0.72 is the lowest X Mod in District history
# Facility inspections completed (SIT)	1	**4**	2	4	4	4	Pump stations inspected in Q2
% of areas of concern identified during SIT resolved within 45 days of report	92%	**≥90%**	96%	90%	95%	92%	30/33 actions identified resolved within 45 days
# work site inspections completed	73	**≥275**	166	337	300	323	
# site visits (for potential BMPS)	0	**≥2**	0	1	2	2	Still exploring options
# GM communications on safety program and performance	3	**≥4**	4	8	9	6	Q2- Injury update and counter reset communications; traffic safety reminder
# of major safety training events offered	6	**7**	8	1	8	7	Q2:Traffic Flagging, Oxy Fuel, Ladder Safety, Excavation, Electrical NFPA 70E, Hazwaste/SPCC; Target for year completed early
Ave. % of targeted employees trained	96%	**≥90%**	96.8%	77.8%	80%	91.8	

Table 2: **Operational Excellence Objectives and Measures**

Measures	Q2 FY17	FY17 Target	YTD	FY16	FY15	FY14	Comments
Outreach plan milestones: % completed	16.39%	>90%	42.6%	92.8%	94%	98%	
Response time to calls for service: % under 1 hour	95.9%	>95%	97.2%	97.5%	97.7%	97.1%	
Response time to contact USD inquiries	100%	>90%	95%	96.9%	96.4%	95%	Q1 = 18/20; Q2= 27/27
# Total adverse impacts on customers	1	<10	2	10	5	12	Q2bubbled toilet with claim filed on 10/4/16 for $24.08
# Emergency preparedness events	2	3	2	2	5	3	Q2 evacuation drill and Disaster Service Worker training
Residential SSC compared to surrounding areas	11.50%	Below the 33rd percentile	11.50%	11.50%	15.3%	11.50%	
projects/initiatives with financial benefit	3	>3	3	3	3	2	Same projects as Q1
# Critical asset failures w/o negative impacts	0	<2	0	0	0	1	
# critical asset failures with negative impacts	0	0	0	3	2	0	Re-evaluating Co-gens and definition of this measure (financial versus operational critical redundancy)
Priority CIP Project milestones met vs. planned	93.33%	>85%	97%	63%	92%	100%	14/15 project milestones were met in Q2; pumps for the lift stations were undersized (contractor issue); functional testing will now occur in Q3
# adverse impacts on environment	1	0	1	1	2	1	Category 1 spill with 99% recovery on 11/18-on Manzanita in Newark - 140 gals escaped to drainage channel; despite the recovery rate, any spill that hits a drainage channel is Cat 1
projects/initiatives with environmental benefit	3	>3	3	3	3	2	Same projects as Q1
Category 2/3 SSOs	2	<10	0	5	4	4	2 Category 3 spills (least impactful); 10/13 on Curtner in Fremont- 620 gals; 10/18-on Hardwood- 4 gals (evaporation)

% Training System Milestones Completed (cumulative total)	15.8%	100%	47.4%	76%	100%	66%	All teams tracking to goals in Q1 (CS, FMC, T&D); 6/19 total planned in Q1; 9/19 completed in Q2 (cumulative)
# competency assessments completed	6	68	6	58	60	22	68 planned for FY17; team indicates they will complete annual target; got a slow start last year as well

DATE: February 17, 2017

MEMO TO: Board of Directors - Union Sanitary District

FROM: Paul R. Eldredge, General Manager/District Engineer
Armando Lopez, Operations Manager, T&D Work Group
Ric Pipkin, TPO Coach, T&D Work Group

SUBJECT: Agenda Item No. 5b - Meeting of February 27, 2017
Information Item: **Plant Process Scorecard**

Background

This report covers the first two quarters of Fiscal Year 2017 and recaps Fiscal Year 2016. The T&D staff operates the District's wastewater treatment plant, manages all environmental laboratory services for the District, and produces the regulatory monitoring reports required for permit compliance. The performance measures for the Plant Process Scorecard focus on the following areas: process control and compliance; energy and chemical efficiency; and employee skill development.

A recap of FY16 shows that T&D missed its target in some areas. The instances recorded for Number of Adverse Impacts were a result of numerous odor complaints registered by one resident. Power consumption continued to be negatively influenced by decreasing influent flows. TPO staff did not meet the goal for Percent Preventative Maintenance Work Orders Completed within Month Scheduled due to several vacancies and training of new Operators. The sludge dewatering polymer target was slightly exceeded due to treatment process impacts caused by the Thickener Control Building Project and the ongoing impacts related to different approaches used to control hydrogen sulfide in the influent sewage.

All other measures met or surpassed expectations.

A few of the measures were altered to provide more information. Odor complaints and odor complaints attributable to the plant were added as separate items from the Number of

Adverse Impacts measure to better reflect actual conditions. Two items were added to the electrical usage information: electricity purchased from PG&E and total electrical usage, which is a total of PG&E, cogeneration and solar. Total wet tons produced was added to the biosolids measure.

Process Control and Compliance:

The "Plant Health Index" measure tracks twelve aspects of treatment plant process performance. The index includes the activated sludge and anaerobic digestion processes, electrical power generation, chemical and energy utilization, and NPDES Permit compliance. The index value average met the target of 85% or greater for FY16. The target for FY17 is currently slightly below its target, but should be met by the end of the fiscal year. The index was below target for most of calendar year 2016 due to the plant process health impacts created by additional septicity introduced into the incoming sewage caused by three main factors. The Thickener Control Building Improvements project required the use of a bypass piping system that increased plant recycle solids loading by 50% while it was in use. The second factor was the continuing difficulty with adequately treating the incoming sewage in the incoming force mains for hydrogen sulfide control. This difficulty is due to the decreasing influent flows and increasing solids loading. The third factor was the Aeration Membrane Replacement project required the use of the older, less effective aeration tanks to facilitate the work. These factors contributed to creating a sludge that requires more polymers to both thicken and dewater. The other alternatives both for better hydrogen sulfide control and for the bypass system used in the CIP project would have resulted in substantial additional costs and increased operational risks to the District.

T&D met all of its NPDES compliance measures for FY16, and is on track to continue regulatory excellence during FY17.

The Biosolids measure tracks the percentage and amount of wet tons disposed of as Class A (composting facility). In FY16, the percentage was slightly below its target of 25% this time last year but the target was met by the end of the fiscal year. This fiscal year, the percentage is above the target at 37% and will continue to be met for the remainder of FY17.

Laboratory service measures track timely analysis of samples for the EC Team and annual compliance with State proficiency standards for accredited environmental laboratories. All laboratory measures met or exceeded their targets for FY16 and are on track to meet the target of 95% or greater in FY17.

Planned Maintenance:

Completing preventive maintenance on time ensures that equipment is kept operating at peak efficiency, and that problems are promptly identified and corrected. TPO missed the target of 95% or greater for completing preventive maintenance work orders within the month they are scheduled for FY16 due to operator turnover and training new operators. During the first two quarters of FY17, this measure is meeting the target.

Energy, Chemical, and Water Utilization:

Electricity production from the District's cogeneration system in FY 17 is averaging 21,168 kwh/d (kilowatt-hours per day) which is below target due to problems encountered with the cogeneration engines. The engines are back on line and the target should be met by the end of FY17.

Due to changes with AT&T, solar information is unavailable beginning November 1st. FMC and IT staff are working on gathering that data in a different way and it is expected to be completed within the next couple of months.

Overall consumption of electricity at the plant is averaging 2,036 kwh/MG (kilowatt hours per million gallons treated) for the first half of FY17, down from FY16 usage of 2,205 kwh/MG. The target value is 2,100 kwh/MG or less. This improvement is attributed to the CIP projects which created aeration system efficiency improvements in CY 2016. The daily plant flow has averaged 22.75 million gallons per day (mgd) so far in FY17, which is very close to FY16 flow of 22.82 mgd. A typical secondary wastewater treatment plant in the U.S. consumes 1,800 to 2,500 kwh/MG.

Polymer consumption for GBT is at the target of ≤5.5 average pounds/dry ton. Polymer consumption for dewatering is above the target of ≤33 average pounds/dry ton. These poor consumption rates are for the reasons discussed above about plant process impacts. These consumption rates are expected to improve in the latter half of the year as the projects that contributed to this performance have concluded.

Water usage for the first half of FY17 is averaging 31,479 gallons per day, which is slightly above the target of ≤30,000 gallons per day. Water usage was increased due to increased polymer usage for dewatering purposes and is expected to improve over the remainder of the fiscal year.

Hydrogen peroxide usage is above the target of ≤8.5 at 11.5 average gallons/hour. This is due to continuing difficulty with adequately treating the incoming sewage in the incoming force mains for hydrogen sulfide control. This difficulty is due to the decreasing influent flows and increasing solids loading. While the peroxide and ferrous chemical system remains the most cost-effective chemical system for controlling hydrogen sulfide, it is becoming increasingly difficult to control the hydrogen sulfide with chemical means alone. The Newark Pump Station Wetwell Improvements Project is intended to address some of the operational challenges associated with using mechanical methods in addition to chemical methods to better address controlling hydrogen sulfide

There were 10 odor complaints registered by one resident in the first half of FY17. No complaints were attributable to the plant during the first half of FY17. There were 11 odor complaints registered by one resident during FY16. One complaint was attributable to the plant in FY 16.

Plant Process Scorecard

	Measures		2017 Fiscal Year to Date	Target	2016 Fiscal Year End
Customer	Number of adverse impacts: Odor Complaint Calls			0	11
	Number of adverse impacts: Odor Complaints Attributable to the Plant		0	0	1
	Number of adverse impacts: Violations, Spills, etc.		0	0	0
Financial	Water Usage – Alvarado Site (Gallons Used per Day)		31,479	≤ 30,000	26,903
	Total Kwh/MG Alvarado Site (Avg per Month)		2,036	< 2100	2,205
	PG&E Purchased – kwh/day		24,711	Track	N/A
	On-site Power Generation (Avg kwh/day)		21,168	23,088	28,911
	Solar Production – kwh/day		445	Track	542
	Total Electrical Usage – kwh/day		46,325	Track	N/A
	H2S/Odor Control	Ferrous Chloride (Ave gal/hour)	32	≤ 35	32
		Hydrogen Peroxide (Ave gal/hour)	11.5	≤ 8.5	7.7
	Disinfection	Hypochlorite (Ave gal/hour)	38.6	≤ 43	29.9
	Solids Conditioning	GBT Polymer (Lbs/dry ton-avg)	5.5	≤ 5.5	5.3
		Dewatering Polymer (Lbs/dry ton-avg)	35.5	≤ 33	33.6
Internal Processes	Biosolids Disposal – Percent Disposed of as Class A		37%	25%	25%
	Plant Operational Health Index (Ave monthly value)		83%	≥ 85%	88%
	Percent preventative maintenance work orders completed within month scheduled		99%	≥ 95%	87%
	Percent Environmental Compliance Samples that Met Turnaround Time (12 days)		100%	≥ 95%	100%
	State Proficiency Test, Percent Areas Passed (T&D Lab)		100%	> 85%	100%
Learning & Growth	Number of Training Modules Updated		3	2	2

DATE: February 17, 2017

MEMO TO: Board of Directors - Union Sanitary District

FROM: Paul R. Eldredge, General Manager/District Engineer
Robert Simonich, Maintenance Manager, FMC Workgroup

SUBJECT: Agenda Item No. 5b - Meeting of February 27, 2017
Information Item: **Plant and Pump Station Maintenance Process Scorecard**

Background

In previous years, Fabrication, Maintenance and Construction (FMC) and Treatment & Disposal Services (T&D) shared a combined Plant Process Scorecard containing performance measurement data for both workgroups. Beginning in fiscal year 2014, FMC and T&D began keeping separate Scorecards and tracking performance measurement data separately.

This report covers the first two quarters of Fiscal Year 2017 and recaps Fiscal Year 2016. The FMC staff maintains the District's wastewater treatment plant, pump stations, and influent force main system. The performance measures for the FMC Process Scorecard focus on the following areas: planned maintenance, labor utilization, energy efficiency at the pump stations, and employee skill development.

Planned Maintenance and Labor Utilization:

The percentage of time FMC spends on planned maintenance work vs. unplanned maintenance work is one of our benchmarking measures. The Water Environment Federation (WEF) identifies planned maintenance at a level greater than 90% as a "best practice." Using WEF's definition for planned work that is preventive, predictive, an asset failure, scheduled vs. unplanned, or corrective, the FMC work group is averaging 98.8% of completed planned maintenance activities. The plant has experienced one critical asset failure within the past four fiscal years.

A second benchmarking measure tracks the percentage of preventive maintenance work orders completed within the month scheduled. Completing preventive maintenance on time ensures that equipment is kept operating at peak efficiency, and that problems are promptly identified and corrected. The FMC work group fell slightly below the target of 95% to 93%. This measure is expected to exceed the target in the 3rd quarter of FY17.

The FMC work group also tracks the number of Priority A work orders issued. This measure is meeting the target of 10 or less per month at an average of 3 per month. Meeting the target for Priority A work orders is a key indicator of the quality of our preventive and predictive maintenance program.

Increasing the efficiency of our labor force is also a goal of the FMC work group. The performance measure used is the percentage of total man-hours spent on the performance of maintenance work. FMC is currently exceeding the target for the fiscal year.

Overtime remains below the target of 5%. Overtime has increased from 2.8% in FY16 to 3.1% in FY17 due to the addition of new employees within the FMC work group and the increased support we have provided for numerous CIP projects.

Energy Efficiency:
FMC continues to track energy consumption at the Irvington and Newark Pump Stations. It is anticipated that targets will be developed for FY18.

Employee Skill Development:
The Learning and Growth measure on the scorecard tracks development of the District's competency-based training program. FMC updated one JCR in the 2nd quarter of FY16.

Staff will be present to answer questions.

Plant and Pump Station Maintenance Process Scorecard

	Measures	2017 Fiscal Year to Date	Target	2016 Fiscal Year End
Customer	Number of priority A work orders (Average per Month)	3	< 10	3
	Number of critical asset failures	0	0	0
	Number with negative impact on the environment	0	0	0
Financial	% Total hours worked spent on maintenance work	83.1%	≥ 80%	81.9%
	Overtime as % of Base Payroll (Ave per month)	3.1%	≤ 5%	2.8%
Internal Processes	% of Time spent on planned vs. unplanned maintenance activities (Best in Class 90%)	98.8%	75% - 90%	98.4%
	Percent preventative maintenance work orders completed within month scheduled	93.0%	≥ 95%	94.0%
	Number of Corrective Work Orders Over 90 Days (Ave/Qtr.)	77	≤150	76
Emplo-yees	Number of training modules developed vs. goal	0	0	0

UNION SANITARY DISTRICT
CHECK REGISTER
2/04/2017-02/17/2017

Check No.	Date	Invoice No.	Vendor	Description	Invoice Amt	Check Amt
163592	2/9/2017	10138297718	DELL MARKETING LP C/O DELL USA	3 VMWARE HOSTS R&R	$48,176.89	$48,176.89
163593	2/9/2017	2044378A	DELTA DENTAL SERVICE	JANUARY 2017 DENTAL	$3,158.45	$27,031.84
	2/9/2017	2044378C		JANUARY 2017 DENTAL	$23,873.39	
163644	2/16/2017	902950172	EVOQUA WATER TECHNOLOGIES	4,563 GAL HYDROGEN PEROXIDE	$21,233.46	$21,233.46
163597	2/9/2017	902940753	EVOQUA WATER TECHNOLOGIES	4,532 GAL HYDROGEN PEROXIDE	$21,089.21	$21,089.21
163626	2/9/2017	23256	RMC WATER AND ENVIRONMENT	ALVARADO BASIN SEWER MASTER PLAN UPDATE	$20,036.17	$20,036.17
163616	2/9/2017	103707	MUNIQUIP, LLC	IPS PUMP 4 REBUILD PARTS	$18,987.36	$18,987.36
163672	2/16/2017	533620170123	US BANK CORP PAYMENT SYSTEM	MONTHLY CAL-CARD STMT - JAN 2017	$17,160.41	$17,160.41
163655	2/16/2017	27291	MARK THOMAS & CO, INC	TEMP CONSTRUCTION INSPECTOR - 12/5 - 12/29/16	$16,635.04	$16,635.04
163619	2/9/2017	11690816	CITY OF NEWARK	2016 NWK OVERLAY - USD IRON ADJUSTMENT	$14,493.60	$14,493.60
163667	2/16/2017	23277	RMC WATER AND ENVIRONMENT	FORCE MAIN CONDITION ASSESSMENT	$9,356.82	$9,356.82
163612	2/9/2017	37432220170201	LINCOLN NATIONAL LIFE INS COMP	LIFE & DISABILITY INSURANCE - FEB 2017	$7,581.34	$7,581.34
163615	2/9/2017	15774	MODULINE	17 ASTD PAINTING TRAILER CABINETS	$6,445.00	$6,445.00
163632	2/9/2017	795915	UNIVAR USA INC	5,010 GALS SODIUM HYPOCHLORITE	$2,207.64	$6,440.49
	2/9/2017	794513		4,598 GALS SODIUM HYPOCHLORITE	$2,026.10	
	2/9/2017	795091		5,008 GALS SODIUM HYPOCHLORITE	$2,206.75	

Check No.	Date	Invoice No.	Vendor	Description	Invoice Amt	Check Amt
163639	2/16/2017	9173724	AT&T	SERV: 12/20/16 - 01/19/17	$19.65	$4,964.96
	2/16/2017	9173726		SERV: 12/20/16 - 01/19/17	$4,742.94	
	2/16/2017	9173748		SERV: 12/20/16 - 01/19/17	$202.37	
163634	2/9/2017	36445	VALLEY OIL COMPANY	ASTD LUBRICANTS	$2,408.99	$4,681.99
	2/9/2017	673742		DIESEL TANK POLISHING	$2,273.00	
163630	2/9/2017	130931	TOTAL WASTE SYSTEMS INC	JANUARY 2017 GRIT DISPOSAL	$4,629.39	$4,629.39
163671	2/16/2017	796635	UNIVAR USA INC	5008 GALS SODIUM HYPOCHLORITE	$2,206.75	$4,369.00
	2/16/2017	795899		4,907 GALS SODIUM HYPOCHLORITE	$2,162.25	
163668	2/16/2017	7789	ROBSON HOMES LLC	REFUND # 19650	$4,262.50	$4,262.50
163600	2/9/2017	21785591	GLOBAL KNOWLEDGE TRAINING	O365 TRAINING: GILL, NGUYEN, JACOB	$4,082.35	$4,082.35
163588	2/9/2017	30289	CALIFORNIA WATER TECHNOLOGIES	44,800 LBS FERROUS CHLORIDE	$3,997.23	$3,997.23
163663	2/16/2017	1108152	POLYDYNE INC	41,220 LBS CLARIFLOC WE-539	$3,890.55	$3,890.55
163642	2/16/2017	30329	CALIFORNIA WATER TECHNOLOGIES	42,160 LBS FERROUS CHLORIDE	$3,662.40	$3,662.40
163661	2/16/2017	666720170131	PACIFIC GAS AND ELECTRIC	SERV TO 1/30/17 PASEO PADRE PS	$313.59	$3,342.48
	2/16/2017	013720170203		SERV TO 02/02/17 BOYCE RD PS	$2,363.39	
	2/16/2017	140120170203		SERV TO 02/01/17 IRVINGTON PS	$24.89	
	2/16/2017	380420170131		SERV TO 1/30/17 CHERRY ST PS	$250.26	
	2/16/2017	892820170131		SERV TO 1/30/17 HAYWARD MARSH	$59.03	
	2/16/2017	898220170131		SERV TO 1/30/17 FREMONT PS	$331.32	

Check No.	Date	Invoice No.	Vendor	Description	Invoice Amt	Check Amt
163583	2/9/2017	7970	AAA SIZZLE	REFUND # 19621	$3,300.00	$3,300.00
163635	2/9/2017	20170201	VISION SERVICE PLAN - CA	FEBRUARY 2017 VISION STMT	$3,179.52	$3,179.52
163589	2/9/2017	16920565	CANON SOLUTIONS AMERICA INC	MONTHLY LEASE 6 CANON COLOR COPIERS	$3,154.15	$3,154.15
163614	2/9/2017	38819	METROMOBILE COMMUNICATIONS INC	32 RADIO REPLACEMENT BATTERIES	$2,929.96	$2,929.96
163651	2/16/2017	16652	ICE SAFETY SOLUTIONS INC	DISTRICT CPR/AED TRAINING (2ND RD)	$2,925.00	$2,925.00
163647	2/16/2017	9321105471	GRAINGER INC	1 BATTERY OPERATED MEGOHMMETER	$543.27	$2,723.62
	2/16/2017	9321105489		ASTD PARTS & MATERIALS	$1,598.67	
	2/16/2017	9321105463		1 KEYSTOCK	$44.24	
	2/16/2017	9321840770		5 PACKS "DANGER" TAGS	$109.75	
	2/16/2017	9322136830		15 PACKS "DANGER" TAGS	$329.25	
	2/16/2017	9326571123		ASTD PARTS & MATERIALS	$98.44	
163664	2/16/2017	916002994221	REPUBLIC SERVICES #916	RECYCLE & ROLL OFF - JANUARY 2017	$2,715.62	$2,715.62
163638	2/16/2017	8797	AMERICAN EAGLE PLUMBING & CON	REFUND # 19636	$2,500.00	$2,500.00
163670	2/16/2017	8770	UNDERGROUND CONSTRUCTION CO	REFUND # 19648	$2,500.00	$2,500.00
163627	2/9/2017	47550913	ROBERT HALF INTERNATIONAL INC	TEMP LABOR-BRIONES, R., WKEND 01/13/17	$2,241.25	$2,241.25
163674	2/16/2017	9779037237	VERIZON WIRELESS	WIRELESS SERV 12/21/16 - 01/20/17	$2,184.57	$2,211.29
	2/16/2017	9779516047		WIRELESS SERV 01/02/17-02/01/17	$26.72	
163641	2/16/2017	695338	BRENNTAG PACIFIC, INC.	1282 LBS SODIUM HYDROXIDE	$666.26	$1,998.80
	2/16/2017	695339		2564 LBS SODIUM HYDROXIDE	$1,332.54	

Check No.	Date	Invoice No.	Vendor	Description	Invoice Amt	Check Amt
163603	2/9/2017	1241705	FERGUSON ENTERPRISES, INC.	ASTD PARTS & MATERIALS	$438.02	$1,556.92
	2/9/2017	5168299		ASTD PARTS & MATERIALS	$436.85	
	2/9/2017	1244072		1 X 20 K HARD COP TUBE	$121.49	
	2/9/2017	5175093		ASTD PARTS & MATERIALS	$101.38	
	2/9/2017	5187336		ASTD PART & MATERIALS	$112.27	
	2/9/2017	1245601		2 GATE VALVE WRENCHES	$346.91	
163582	2/9/2017	66628	3T EQUIPMENT COMPANY INC	1 PIPEPATCH KIT - WINTER	$823.03	$1,540.64
	2/9/2017	66629		1 PIPEPATCH KIT - WINTER	$717.61	
163609	2/9/2017	1043637	INDUSTRIAL SAFETY SUPPLY	ASTD CALIBRATION GAS	$1,383.53	$1,383.53
163625	2/9/2017	314378	RKI INSTRUMENTS INC	ASTD PARTS & MATERIALS	$938.36	$1,259.38
	2/9/2017	314463		2 H2S SENSOR W/WIRES & CONNECTOR	$321.02	
163620	2/9/2017	38136	OWEN EQUIPMENT SALES	POTHOLING PARTS	$1,175.37	$1,175.37
163618	2/9/2017	474666600	NEW PIG CORPORATION	36 BAGS OF RAGS	$1,174.52	$1,174.52
163631	2/9/2017	20170206	KIM TRUONG	EXP REIMB: LODGING/PER DIEM/MILEAGE FOR CAPPO CONF - NAPA	$1,129.94	$1,129.94
163643	2/16/2017	20170209	PAUL ELDREDGE	EXP REIMB: 3 MEALS W/BOARD & CASA CONF LODGING/PARKING/ME	$1,101.16	$1,101.16
163611	2/9/2017	20170207	MARCUS LEE	EXP REIMB: LODGING/PER DIEM/MILEAGE FOR GRADE V REVIEW CLA	$1,035.19	$1,035.19
163610	2/9/2017	2379A	KEN GRADY CO INC	2 MSA 02 SENSORS	$1,015.76	$1,015.76
163622	2/9/2017	20170206	MICHELLE POWELL	TRAVEL REIMB: LODGING/MEALS/MILEAGE/TIPS/BAGGAGE FEE	$1,006.82	$1,006.82

Check No.	Date	Invoice No.	Vendor	Description	Invoice Amt	Check Amt
163669	2/16/2017	4868173012617	SIERRA SPRING WATER COMPANY	WATER SERVICE 12/30/16 - 01/24/17	$756.66	$998.83
	2/16/2017	8122768012617		BOTTLESS COOLERS RENTAL	$242.17	
163617	2/9/2017	20170131	NAPA AUTO PARTS	MONTHLY AUTO PARTS STMT - JAN 2017	$966.28	$966.28
163586	2/9/2017	9129451	AT&T	SERV: 12/13/16 - 01/12/17	$87.12	$952.54
	2/9/2017	9129450		SERV: 12/13/16 - 01/12/17	$65.69	
	2/9/2017	9129447		SERV: 12/13/16 - 01/12/17	$757.02	
	2/9/2017	9129449		SERV: 12/13/16 - 01/12/17	$42.71	
163590	2/9/2017	3520061060	CHARTWELL STAFFING SVCS INC	TEMP LABOR-ALVARADO MURCIA, S., WEEK ENDING 11/13/16	$912.12	$912.12
163658	2/16/2017	13804019	MCMASTER SUPPLY INC	ASTD PARTS & MATERIALS	$824.00	$824.00
163654	2/16/2017	13732	LOOKINGPOINT INC	CREDIT FOR MONTHLY PREMIER SERVICE MAY - NOV 2016	$-3,500.00	$801.75
	2/16/2017	13923		SIP MIGRATION	$1,851.75	
	2/16/2017	13850		ANNUAL SUPPORT FOR PHONE AND NETWORK - JAN 2017	$1,225.00	
	2/16/2017	13710		ANNUAL SUPPORT FOR PHONE AND NETWORK - DEC 2016	$1,225.00	
163660	2/16/2017	38200	OWEN EQUIPMENT SALES	ASTD POTHOLING PARTS	$724.79	$724.79
163656	2/16/2017	101640	MCINERNEY & DILLON, P.C.	LEGAL SERVICES - HEADWORKS KNIFE GATE VALVES 1-3	$720.00	$720.00
163623	2/9/2017	13051G	R & S ERECTION OF S ALAMEDA	EXIT GATE UPGRADES	$706.00	$706.00
163613	2/9/2017	98632507	MCMASTER SUPPLY INC	1 PACK NAILS	$20.64	$703.72
	2/9/2017	11323873		ASTD PARTS & MATERIALS	$533.42	
	2/9/2017	12524657		ASTD PARTS & MATERIALS	$149.66	

Check No.	Date	Invoice No.	Vendor	Description	Invoice Amt	Check Amt
163653	2/16/2017	13043	LIGHTHOUSE SERVICES INC	ANNUAL FRAUD HOTLINE FEE 2/1/17 - 2/1/18	$690.00	$690.00
163608	2/9/2017	35602739	HYATT REGENCY VALENCIA	PREPAY LODGING: MICHAEL MOSLEY 3/5-3/10/17	$673.17	$673.17
163646	2/16/2017	1083864078	G&K SERVICES CO	UNIFORM LAUNDERING SERVICE	$261.73	$669.87
	2/16/2017	94002679		TPO OPERATOR JACKETS	$159.61	
	2/16/2017	1083864076		UNIFORM LAUNDERING & RUGS	$232.83	
	2/16/2017	1083864080		ASTD DUST MOPS, WET MOPS & TERRY TOWELS	$15.70	
163605	2/9/2017	10269601	HACH COMPANY	LAB SAMPLE TESTING SUPPLIES	$663.83	$663.83
163659	2/16/2017	190305	NATEC INTERNATIONAL INC.	CPR/1ST AID/AED TRAINING FOR 3 PLANT OPERATORS	$575.00	$575.00
163598	2/9/2017	1083862099	G&K SERVICES CO	UNIFORM LAUNDERING & RUGS	$230.43	$510.37
	2/9/2017	1083862101		ASTD DUST MOPS, WET MOPS & TERRY TOWELS	$15.70	
	2/9/2017	1083862100		UNIFORM LAUNDERING SERVICE	$264.24	
163594	2/9/2017	8831	DISCOUNT PLUMBING & ROOTER CO	REFUND # 19630	$500.00	$500.00
163595	2/9/2017	8613	DRAIN DOCTOR	REFUND # 19628	$500.00	$500.00
163596	2/9/2017	7894	ANJUMAN E-NAJMI	REFUND # 19620	$500.00	$500.00
163621	2/9/2017	8531	PLUMBING TECH INC	REFUND # 19629	$500.00	$500.00
163629	2/9/2017	8807	STREAMLINE PLUMBING & DRAIN	REFUND # 19619	$500.00	$500.00
163676	2/16/2017	8842	WESTCOAST PLUMBING SERVICE INC	REFUND # 19635	$500.00	$500.00
163584	2/9/2017	170101015	AIRTECH MECHANICAL INC	HVAC CONTRACT - BUILDINGS 70, 82 & 83	$457.50	$457.50
163666	2/16/2017	314840	RKI INSTRUMENTS INC	ASTD SENSORS	$452.72	$452.72

Check No.	Date	Invoice No.	Vendor	Description	Invoice Amt	Check Amt
163604	2/9/2017	81534	H20 PRECISION INC	14 WATERJET CUT 1' HOLE IN MANHOLE COVERS	$420.00	$420.00
163624	2/9/2017	5820	RED WING SHOE STORE	SAFETY SHOES - SCHWARTZ & FORTNER	$416.00	$416.00
163675	2/16/2017	8047407606	VWR INTERNATIONAL LLC	4 CARBOY RECTANGULAR W/HANDLE	$390.67	$390.67
163606	2/9/2017	5663765	HOSE & FITTINGS ETC	ASTD PARTS & MATERIALS	$317.65	$344.04
	2/9/2017	5662876		2 MALE SWIVELS	$26.39	
163585	2/9/2017	2151	AMERICAN NATIONAL RED CROSS	REFUND: DUPLICATE PAYMENT OF SSC INVOICE 2151	$329.50	$329.50
163602	2/9/2017	9320183800	GRAINGER INC	2 MINIATURE LIMIT SWITCHES	$227.44	$322.16
	2/9/2017	9320025787		2 BATTERIES	$94.72	
163652	2/16/2017	201159993	IRON MOUNTAIN	DATA/MEDIA OFF-SITE STORAGE - NOV 2016	$247.97	$247.97
163591	2/9/2017	273276	CURTIS & TOMPKINS, LTD	10 LAB SAMPLE ANALYSIS	$240.00	$240.00
163649	2/16/2017	944720170127	HOME DEPOT CREDIT SERVICES	MONTHLY HARDWARE STMT - JAN 2017	$209.26	$209.26
163648	2/16/2017	3K4756	HARRINGTON INDUSTRIAL PLASTICS	ASTD PVC FITTINGS	$204.74	$204.74
163673	2/16/2017	36852	VALLEY OIL COMPANY	ASTD LUBRICANTS	$195.36	$195.36
163599	2/9/2017	2773701208	GLACIER ICE COMPANY INC	132 7-LB BAGS OF ICE	$187.44	$187.44
163628	2/9/2017	2934007002	S & S SUPPLIES & SOLUTIONS	72 PRS AZTEC BROWN SAFETY GLASSES	$172.26	$172.26
163607	2/9/2017	532932	HULBERT LUMBER SUPPLY	ASTD LUMBER SUPPLIES	$136.46	$136.46
163633	2/9/2017	26983331	UPS - UNITED PARCEL SERVICE	REDELIVERY FREIGHT CHARGE	$95.00	$95.00
163636	2/9/2017	13524	WESTERN MACHINE & FAB INC	1 METRIC KEY - MACHINE KEYS PER ORDER	$90.00	$90.00
163665	2/16/2017	20170213	LOUIS RIVERA III	EXP REIMB: MILEAGE FOR TRAINING	$65.81	$65.81

Check No.	Date	Invoice No.	Vendor	Description	Invoice Amt	Check Amt
163657	2/16/2017	140284	MCIVORS HARDWARE	ASTD PARTS & MATERIALS	$64.44	$64.44
163645	2/16/2017	1243819	FERGUSON ENTERPRISES, INC.	ASTD PARTS & MATERIALS	$54.60	$54.60
163637	2/16/2017	4047286120170202	ALAMEDA COUNTY WATER DISTRICT	SERV TO: 02/02/17 - PASEO PADRE	$44.91	$44.91
163640	2/16/2017	87896581201252017	AT&T	SERV: 12/18/16 - 01/17/17	$39.15	$39.15
163601	2/9/2017	82494	GORILLA METALS	ASTD METAL, STEEL, STAINLESS & ALUMINUM	$37.05	$37.05
163587	2/9/2017	11694961	BLAISDELL'S	ASTD OFFICE SUPPLIES	$10.93	$28.48
	2/9/2017	11695030		ASTD OFFICE SUPPLIES	$17.55	
163650	2/16/2017	5664313	HOSE & FITTINGS ETC	ASTD PARTS & MATERIALS	$23.10	$23.10

Invoices:

Credit Memos :	**1**	**-3,500.00**
$0 - $1,000 :	**85**	**26,935.12**
$1,000 - $10,000 :	**42**	**117,549.16**
$10,000 - $100,000 :	**9**	**201,685.53**
Over $100,000 :	**0**	
Total:	**137**	**342,669.81**

Checks:

$0 - $1,000 :	**48**	**20,360.89**
$1,000 - $10,000 :	**37**	**117,464.94**
$10,000 - $100,000 :	**9**	**204,843.98**
Over $100,000 :		
Total:	**94**	**342,669.81**

DATE: February 16, 2017

MEMO TO: Board of Directors - Union Sanitary District

FROM: Paul R. Eldredge, General Manager/District Engineer

SUBJECT: Agenda Item No. 9 - Meeting of February 27, 2017
Information Item: **CASA 2017 Winter Conference**

Recommendation

Receive an informational report on the California Association of Sanitation Agencies (CASA) 2017 Winter Conference on the sessions attended by the General Manager.

Background

CASA held its winter conference on January 18-20, 2017. The following is a summary of the presentations from the conference attended by the GM. Handouts are available for most of the presentations. Please let us know what session you would be interested in obtaining more information on and copies or links to the presentations can be provided.

- Federal Legislative Committee
- Across the Aisle: An Insiders Perspective on the Aftermath of the 2016 General Election
- Developing Recycling Criteria for Direct Potable Reuse
- Economic Forecast – Christopher Thornberg, PhD, Beacon Economics
- Renewable Resource Program Update
- Climate Policy Outlook
- Bay Area Biosolids to Energy Coalition
- State Legislative Committee
- Opening Your Doors to your Community – Plant Open House Panel Discussion

Attachments:
CASA 2017 Winter Conference Program Guide
CASA January 2017 Federal Legislative Committee Meeting Agenda and attachments
Bay Area Biosolids to Energy Coalition 2 Year Strategic Plan
CASA January 2017 State Legislative Committee Meeting Agenda and attachments

PROGRAM

CASA
WINTER CONFERENCE

January 18-20, 2017 • Palm Springs, CA

Leveraging Our Resources

Meeting Room WIFI Password is
CASA2017 (case sensitive)

Bobbi Larson,
CASA Executive Director

Message from the Executive Director

Welcome to CASA's 2017 Winter Conference. As we leave behind the tumult and uncertainty of the past year, we begin the new-year with a focus on advancing CASA's key legislative, regulatory and policy priorities. Our theme, "Leveraging Our Resources", emphasizes the need to work together to achieve these goals through regional collaboration, local, state, and federal investment, and public-private partnerships. The complexity and changing nature of our political and natural environments require different approaches that reach across jurisdictional and institutional boundaries.

The diversity of our topics and speakers reflects this reality. Our keynote speaker, economist Christopher Thornberg, will share his economic forecast and project what lies ahead for jobs and infrastructure. Two respected political analysts, Matt Rexroad and Paul Mitchell, will help us understand the recent state and federal elections and what the results signal for CASA members. Other panels will address infrastructure partnerships, renewable resource management and building relationships with your local community by opening your doors to the public.

We also encourage you to take advantage of our ever-popular roundtables. This session allows you to engage with a small group of your peers in an informal setting to share experiences, issues and challenges on a wide variety of topics from asset management to rate setting to potable reuse.

Don't miss Thursday evening's Associates Reception and CASA Education Foundation Auction. Join your colleagues for cocktails and conversation, and support scholarships for promising students.

We expect the year ahead to be an active one on many fronts. In addition to our ongoing advocacy in Sacramento and Washington D.C., we will move forward with CASA's strategic plan. Key initiatives include developing a succession plan and a financial plan to ensure the association's future success. We are fortunate to have steady leadership from the Board of Directors, a professional and dedicated staff, and dozens of committee and workgroup volunteers. But the single most important asset we have for all of our initiatives is our membership. Thank you for joining us for the conference and for all your contributions to CASA's success.

Associates Committee Giving Back

Acting Together to Support CASA.

We thank you for your ongoing commitment and generous contribution to our 2017 conference programs!

CALL FOR APPLICATIONS FOR THE CASA AWARD OF EXCELLENCE

2017 MARKS THE 20TH ANNIVERSARY OF THE CASA AWARDS PROGRAM

Schedule:
- Applications will be accepted beginning January 27, 2017.
- Deadline for submissions is Friday, April 14, 2017.

Presentation:
The Awards Committee is exploring exciting ways to honor nominees and recipients at our annual conference at the Marriott Marquis San Diego in August.

Please visit casaweb.org for more information and to download the application. We look forward to recognizing your great work!

CASA EDUCATION FOUNDATION

A Fundraiser *with a* PURPOSE

WHAT
Associates Reception with Silent Auction & Raffle

WHEN
Thursday, 5:30-6:30 p.m.

WHERE
Plaza Ballroom

Join us Thursday evening as the CASA Associates host a reception in support of the CASA Education Foundation.

Meet the CASA Associates and help support the next generation of clean water professionals. To learn more about the Foundation or make a donation, please contact any CASA Education Foundation Board Member or visit casaedfoundation.org.

Michael Dunbar	Barbara Hockett	Robert Ghirelli
James Dunbar	Jim Kelly	Joyce Gwidt
Jeff Moorhouse		

Wednesday, January 18, 2017

7:30 a.m. – 12:00 p.m.
CSRMA Training Seminar
Location: Plaza Ballroom, 1st Floor

8:00 a.m. – 5:00 p.m.
Registration
Location: Lobby, 1st Floor

10:00 a.m. – 12:00 p.m.
CASA Board of Directors Meeting
Location: Tapestry Room, 1st Floor

12:00 p.m. – 1:00 p.m.
Lunch on Your Own

12:00 p.m. – 1:30 p.m.
Associates Committee Meeting
Location: Palm Canyon AB, 2nd Floor

OCSD's Biosolids Master Plan
Jim Colston, Orange County Sanitation District

12:00 p.m. – 1:30 p.m.
Communications Workgroup Meeting
Location: Caliente Room, 2nd Floor

12:00 p.m. – 1:30 p.m.
CSRMA Executive Board Meeting
Location: Whitewater Boardroom, 2nd Floor

1:30 p.m. – 4:00 p.m.
Roundtable Series
Location: Horizon 1 and Foyer, 2nd Floor

1:30 p.m. – 2:30 p.m. Round 1
2:30 p.m. – 3:00 p.m. Networking Break
3:00 p.m. – 4:00 p.m. Round 2

4:15 p.m. – 5:15 p.m.
Federal Legislative Committee Meeting
Location: Palm Canyon AB, **2nd** Floor

4:15 p.m. – 5:30 p.m.
CSRMA Board of Directors Meeting
Location: Plaza Ballroom, 1st Floor

5:30 p.m. – 6:30 p.m.
Icebreaker Reception
Location: Poolside

Thursday, January 19, 2017

7:30 a.m. – 4:30 p.m.
Registration
Location: Lobby, 1st Floor

8:00 a.m. – 9:15 a.m.
Utility Leadership Committee Meeting
Location: Plaza Ballroom, 1st Floor

8:00 a.m. – 9:30 a.m.
Breakfast
Location: Horizon Foyer, 2nd Floor

9:30 a.m. – 12:00 p.m.
General Session
Vice President Paul Bushee, Presiding
Location: Horizon Ballroom, 2nd Floor

9:30 – 10:30 a.m.
Across the Aisle: An Insider's Perspective on the Aftermath of the 2016 General Election
Max Rexroad, Meridian Pacific
Paul Mitchell, Redistricting Partners

10:30 – 11:00 a.m.
Developing Recycling Criteria for Direct Potable Reuse
Brian Bernados, State Water Board Division of Drinking Water

11:00 – 12:00 p.m.
Forging Infrastructure Partnerships
Moderator: Lisa Haney, Orange County Sanitation District
Ashwini Kantak, City of San Jose
Dave Smith, USEPA
Martha Tremblay, Los Angeles County Sanitation Districts

12:00 p.m. – 1:30 p.m.
Conference Luncheon
President Jeff Moorhouse, Presiding
Location: Plaza Ballroom, 1st Floor

President's Report
State & Federal Legislative Report

2:00 p.m. – 4:00 p.m.
Afternoon Session
Secretary Treasurer E.J. Shalaby, Presiding
Location: Horizon Ballroom, 2nd Floor

2:00 – 3:00 p.m.
Keynote: *Christopher Thornberg, PhD, Beacon Economics*

continued

WINTER CONFERENCE

January 18-20, 2017 • Palm Springs, CA

Leveraging Our Resources

Thursday, January 19, 2017 *continued*

3:00 – 4:00 p.m.

Being on the Leading Edge of Renewable Resources and Climate Change

Renewable Resource Programs Update

Moderator/Speaker: Greg Kester, CASA

Biosolids on Trial: Reflections on the Kern County Case

Jimmy Slaughter, Beveridge & Diamond

Climate Policy Outlook

Sarah Deslauriers, CASA

4:30 p.m. – 5:30 p.m.

Bay Area Biosolids to Energy Coalition Meeting

Location: Tapestry Room, 1st Floor

5:30 p.m. – 6:30 p.m.

Associates Reception and Education Foundation Fundraiser

Location: Plaza Ballroom, 1st Floor

Make a Difference on Capitol Hill

Actions speak louder than words. Join your colleagues in the nation's capital **February 27 – March 1, 2017** to stand up for citizen suit reform, recycled water funding, and regulatory streamlining. Hear first-hand from members of the California congressional delegation, USEPA and members of the Washington press corps, and have your voice heard.

Registration Now Open:
http://casaweb.org/events/washington-d-c-policy-forum-2

Friday, January 20, 2017

8:00 a.m. – 9:00 a.m.

State Legislative Committee Meeting

Location: Plaza Ballroom, 1st Floor

8:00 a.m. – 9:30 a.m.

Breakfast

Location: Horizon Foyer, 2nd Floor

8:00 a.m. – 11:00 a.m.

Registration

Location: Lobby, 1st Floor

9:30 a.m. – 11:00 a.m.

Closing Session

President Jeff Moorhouse, Presiding

Location: Horizon Ballroom, 2nd Floor

9:30 – 9:45 a.m.

Trenton Saunders, 2016 Scholarship Recipient, UCLA

9:45 – 10:45 a.m.

Opening Your Doors to Your Community: Planning Open House and Plant Tour Events

Moderator: Sue Stephenson, Dublin San Ramon Services District

Roger Bailey, Central Contra Costa Sanitary District

Paul Eldredge, Union Sanitary District

Steve Wagner, Goleta Sanitary District

Dave Pedersen, Las Virgenes Municipal Water District

10:45 – 11:00 a.m.

President's Closing Remarks

11:00 a.m. – 3:00 p.m.

Attorneys Committee Meeting

Location: Plaza Ballroom, 1st Floor

Upcoming CASA Events

Mark your calendar!

February 27 – March 1, 2017
Washington D.C. Policy Forum
Washington, D.C.

April 19, 2017
Public Policy Forum
Sacramento, CA

August 22-24, 2017
62nd Annual Conference
San Diego, CA

Read your CASA Connects newsletter and visit our website for event updates.

Roundtable Series Schedule

Horizon Ballroom and Horizon Foyer
Sessions will be repeated
Session 1 – 1:30 – 2:30 pm. • Session 2 – 3:00 – 4:00 pm.

Table #	Topic	Facilitator
RT1	**How to Sell a Rate Increase to Your Community**	*Jeff Reinhardt, Las Virgenes Municipal Water District & Angela Lowrey, Delta Diablo*
RT2	**How to Get the Most Out of Your Capitol Meetings in Sacramento and DC**	*Adam Link, Jessica Gauger & Eric Sapirstein, CASA*
RT3	**Developing a Strategy for Good Governance**	*Brent Ives, BHI Management Consulting*
RT4	**Succession Planning**	*Kevin Hardy & Georg Krammer, Koff & Associates*
RT5	**Shrink to Fit Asset Management: Sharing Solutions from Large Agency to Small Agency**	*Jim Graydon, Brown and Caldwell*
RT6	**Thermal Conversion**	*Rudy Kilian, Carollo*
RT7	**Nutrient Policy & Science Update**	*Tom Grovhoug, Larry Walker Associates*
RT8	**Water and Wastewater Agency Collaboration**	*Martha Tremblay, County Sanitation Districts of Los Angeles*
RT9	**What's on the Horizon for Collection Systems**	*Paul Causey, Central Contra Costa Sanitary District*
RT10	**Effect/Consequences of Conservation on Collection Systems and Treatment Utilities**	*James Ferro, AESC, Inc. & Wyatt Troxel, EnerVention Strategist*
RT11	**Effectively Establishing Rates**	*Brian Jewett, Black & Veatch*
RT12	**Low Carbon Fuel Standards**	*Wes Ingram, CARB*
RT13	**Science & Research**	*Karri Ving, San Francisco Public Utilities Commission*
RT14	**Regulatory Hot Topics**	*Lisa Haney, Orange County Sanitation District & Jackie Zipkin, East Bay Municipal Utility District*
RT15	**Treatment Considerations for Potable Reuse**	*Mike Falk, HDR Inc.*

guidebook

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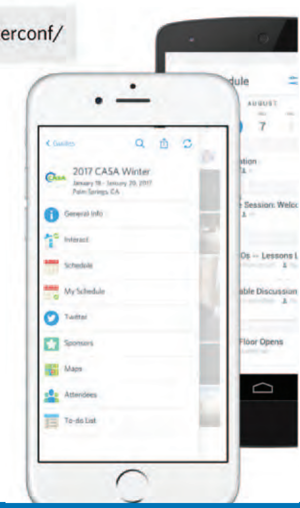
   2017 CASA Winter Conference



Save The Date

Participate in the policy process in 2017

April 19th is the one-day joint CASA/WateReuse Public Policy Forum in Sacramento, CA.

Join us in advocating for priority issues with key policy makers and legislators, and get all of the insider details on critical legislative issues of interest. Take action on behalf of your agency in 2017!

Speaker Profiles

ROGER BAILEY, CENTRAL CONTRA COSTA SANITARY DISTRICT

Roger became the General Manager at the Central Contra Costa Sanitary District on August 19, 2013. CentralSan is a progressive sanitary district providing wastewater collection and treatment services to approximately 471,000 people in the central Contra Costa area.

Before his employment at CentralSan, Roger served as the head of the City of San Diego Public Utilities Department and as Deputy City Manager and Utilities Director for the City of Glendale, Arizona; Utilities Director for the City of Royal Palm Beach, Florida; Assistant Utilities Director for the City of Valdosta, Georgia; and Senior Engineer with the City of Tallahassee Water Utilities Department. Under his leadership, San Diego and Glendale's Utilities Departments won platinum awards for Utility Excellence from the Association of Metropolitan Water Agencies. Since coming to CentralSan, the facility has won the NACWA Platinum Award for three consecutive years.

Roger is a registered professional engineer in Arizona and Florida. His education includes M.S. and B.S. degrees in Civil Engineering from Florida A&M University. He also holds a B.S. degree in Physics and Mathematics from the University of Winnipeg, Canada.

BRIAN BERNADOS, STATE WATER RESOURCES TREATMENT TECHNOLOGY

Brian Bernados has served as staff to the California State Water Board (formerly Department of Public Health) for over 23 years. As a Technical Specialist, he has expertise in alternative technology, advanced technology, RO/AOP, UV disinfection (potable, recycled & reuse), recycled water, groundwater recharge, surface water augmentation, direct reuse, seawater desalination, and water treatment additives/components. In this role, he also works on recycled water, water reuse via groundwater recharge, surface water augmentation, direct potable reuse feasibility, and alternative technology acceptance. Brian holds a Master of Science in Civil Engineering with emphasis on water, environmental, and public health from San Diego State University and a Bachelor of Science in Civil Engineering from the University of Pittsburgh. He is a registered Professional Engineer with the State of California.

SARAH DESLAURIERS, CAROLLO ENGINEERS, INC.

Sarah serves as CASA's Climate Change Program Manager. She tracks and coordinates responses to regulatory issues and policy initiatives that impact the wastewater sector and proactively engages state agencies in discussions on both mitigation and adaptation related issues to create opportunities for the wastewater sector in building resilient communities. Sarah also serves as Climate Change Specialist for Carollo Engineers, Inc.

Sarah holds a BS and MS in Atmospheric, Oceanic, and Space Science, an MSE in Environmental and Water Resources Engineering, and a graduate certificate in Industrial Ecology from the University of Michigan. Sarah is a registered professional engineer.

PAUL R. ELDREDGE, UNION SANITARY DISTRICT

Paul R. Eldredge was appointed to serve as General Manager of Union Sanitary District in August of 2014. Mr. Eldredge joined the District with more than 19 years of experience in financing, planning, designing, constructing, operating, and maintaining a multitude of engineering and public works projects, which included water, wastewater, and water recycling systems. His expertise in management of large organizations includes strategic planning and financial management. As the District's chief executive officer, Paul balances the continued demands of maintaining critical infrastructure, financial stability, innovation, sustainability, and long-term planning.

Mr. Eldredge has over 14 years' experience in municipal engineering and public works. He is a registered Civil

Speaker Profiles

Engineer in California and Hawaii. Paul holds a Bachelor's Degree in Civil Engineering and a minor in Physics from California State University, Sacramento, and a Masters of Business Administration from Colorado State University.

Mr. Eldredge is an active member of the Managers Advisory Committee for the East Bay Dischargers Authority and CASA's Federal Legislative Committee.

ASHWINI KANTAK, CITY OF SAN JOSE

Ms. Kantak is Assistant Director in the Environmental Services Department in the City of San Jose and oversees administrative services, the sustainability and compliance division, and a multi-billion dollar capital program for the San Jose/Santa Clara regional wastewater facility. Prior to this role, Ashwini was an Assistant to the City Manager and led the development and implementation of several citywide policies and programs related to infrastructure and environmental sustainability. Ashwini has an undergraduate degree in Architecture from Mumbai, India, a graduate degree in Architecture from Iowa State University, and a graduate degree in Public Policy and Administration from Northwestern University. She is a licensed architect in California since 1997 and a LEED Accredited professional. She enjoys combining her educational and professional training with her interest in sustainable communities to advance the City's goals of economic growth, environmental sustainability and a better quality of life for the residents of San Jose.

PAUL MITCHELL, REDISTRICTING PARTNERS

Paul is the owner of Redistricting Partners, and Vice President of Political Data Inc. – nationally recognized bipartisan industry leaders in their respective fields. Paul has a Masters in Public Policy with a focus on urban planning and econometrics. For the past 20 years he has been involved in campaigns from San Diego to Marin, California to North Carolina.

Redistricting Partners brings together political voting behavior and Geographic Information experts, with the best data and mapping.

Redistricting Partners is currently contracted with several statewide groups helping them navigate legislative and congressional redistricting, and over 20 local agencies such as cities, community colleges and special districts as they conduct their redistricting. Mr. Mitchell has become a national expert on redistricting, appearing in state and national publications and was featured in a CNN Presents documentary on the State's new decennial process.

DAVID W. PEDERSEN, LAS VIRGENES MUNICIPAL WATER DISTRICT

David W. Pedersen, is the General Manager for Las Virgenes Municipal Water District (LVMWD). He also serves as the Administering Agent and General Manager for the Las Virgenes – Triunfo Joint Powers Authority that provides wastewater treatment, recycled water and biosolids composting services for western Los Angeles and eastern Ventura counties.

Mr. Pedersen is a registered professional engineer. He was appointed to his present position in January 2013. Prior to joining LVMWD, he was the Executive Director of Operations for Irvine Ranch Water District and held a number of managerial positions with the Los Angeles County Department of Public Works.

He earned his engineering degree at UC Irvine and followed that with an MBA from California State University, Long Beach. He is a member of the American Society of Civil Engineers, serves on the Scientific Advisory Board for the Association for Environmental Health & Sciences Foundation.

Speaker Profiles

MATT REXROAD, MERIDIAN PACIFIC

Matt Rexroad is both a founding partner at Meridian Pacific and a longstanding local government official.

Currently serving as a Yolo County Supervisor, and having previously served as both Mayor and Vice Mayor of Woodland from 2002-06, Matt has extensive experience serving both the public and private sector.

Following his return from Iraq in 2003, Matt co-founded Meridian Pacific Inc. with John Peschong and Tom Ross. Matt's expertise with the Sacramento-based, award-winning public affairs firm includes background in California demographics, political trends, voter communication, public policy, and elected leadership. Matt is also considered to be one of the leading experts in redistricting.

Matt earned a Bachelor of Arts degree in Political Science and a Master's degree in Public Administration from the University of Southern California as well as a Juris Doctor from McGeorge School of Law. He is an active member of the California State Bar.

TRENTON SAUNDERS

Trenton is a fourth-year student at UCLA, majoring in Civil Engineering with a minor in Environmental Engineering. Over the summer, Trenton participated in the 2016 UCI-Water PIRE: UPP Down Under Research Program. He is a member of Chi Epsilon (Civil Engineering Honor Society) and the Henry Samueli School of Engineering and Applied Science. Outside the classroom, he is the Vice President of the UCLA Surf Team and a DJ for UCLA Radio. Trenton is beginning to carry out research on biofilters through the Civil Engineering Department. His lab is working to optimize the efficiency and longevity of biofilters, through the manipulation of soil media. Trenton is on a path to becoming an urban water resource engineer and plans on attending graduate school with a focus in water resource engineering.

JIMMY SLAUGHTER, BEVERIDGE & DIAMOND

Jimmy Slaughter is a partner with the law firm of Beveridge & Diamond, where his practice focuses on environmental, toxic tort and constitutional litigation.

Mr. Slaughter is recognized as a leader in litigation involving drinking water, wastewater and biosolids over the last twenty years. He served as lead counsel in the successful litigation that overturned the Kern County biosolids ban. His representation of cities, farms, contractors, and trade associations on waste issues spans toxic tort, enforcement defense, and complex constitutional and administrative law issues regarding competing federal, state and local authority.

Mr. Slaughter speaks regularly at meetings of the Water Environment Federation, its state affiliates, and the National Association of Clean Water Agencies. He works with the country's top hydrogeologists, microbiologists and fate and transport experts to defend his clients in the courts and before agencies.

DAVID SMITH, UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

David Smith is the Manager of the NPDES Permits Office at EPA Region 9 in San Francisco. Prior to moving to permits, Dave managed Region 9's Wetlands and TMDL programs, and worked on watershed planning, water quality standards, and grants management. Dave has also worked for the State of California, the Congressional Budget Office, and several environmental consultants. He also worked in real estate development and managed his family's buffalo-cattle ranch in Oklahoma. He holds degrees from UC-Berkeley and Wesleyan University.

Speaker Profiles

CHRISTOPHER THORNBERG, BEACON ECONOMICS, LLC

Christopher Thornberg is Founding Partner of Beacon Economics, LLC and widely considered to be one of the nation's leading economists. He is also the Director of the Center for Economic Forecasting and Development at the UC Riverside School of Business Administration and an Adjunct Professor at the School.

An expert in economic forecasting, regional economics, labor markets, economic policy, and industry and real estate analysis, he was one of the earliest and most adamant predictors of the sub-prime mortgage market collapse and of the global economic recession that followed.

In 2015, Dr. Thornberg was named to California State Treasurer John Chiang's Council of Economic Advisors. He also serves on the advisory boards of Paulson & Co. Inc., one of Wall Street's leading hedge funds, and of the Los Angeles Area Chamber of Commerce, Southern California's largest not-for-profit business federation.

Between 2008 and 2012 he served as a chief economic advisor to the California State Controller's Office and was Chair of then State Controller John Chiang's Council of Economic Advisors.

Dr. Thornberg holds a Ph.D in Business Economics from The Anderson School at UCLA, and a B.S. degree in Business Administration from the State University of New York at Buffalo.

MARTHA TREMBLAY, SANITATION DISTRICTS OF LOS ANGELES COUNTY

Martha Tremblay has 20 years of professional experience at the Sanitation Districts of Los Angeles County working on a variety of wastewater projects relating to sewer design, collection system operation and maintenance, regulatory compliance and reuse. She is currently the Assistant Department of Head of the Technical Services Department. This department provides technical support services to all Districts wastewater and solid waste facilities including regulatory compliance, laboratory services, research, and employee health and safety. She has a Masters Degree in Civil Engineering from UC Berkeley, and a Bachelors Degree in Civil Engineering from the University of Southern California.

STEVE WAGNER, GOLETA SANITARY DISTRICT

Steve Wagner is the General Manager of the Goleta Sanitary District. Mr. Wagner is responsible for a 9 MGD wastewater treatment plant, 3 MGD water reclamation plant, over 200 miles of collection system and an ocean outfall. Steve previously served as Assistant General Manager and prior to that he served as Public Works Director/City Engineer for the City of Goleta and City of Carpinteria.

California Association of Sanitation Agencies

COMMON ACRONYMS

ACWA	Assoc of California Water Agencies
ANPRM	Advanced Notice of Proposed Rulemaking
APWA	American Public Works Association
ATCM	Airborne Toxic Control Measure
AWWA	American Water Works Association
BACWA	Bay Area Clean Water Agencies
BOD	Biochemical Oxygen Demand
CAAQS	Calif Ambient Air Quality Standard
CalARP	Calif Accidental Release Prevention Program
CARB	Calif Air Resources Board
CDFA	Calif Dept of Food & Agriculture
CDO	Cease and Desist Order
CECs	Constituents of Emerging Concern
CEQA	Calif Environmental Quality Act
CFR	Code of Federal Regulations
CMOM	Capacity, Management, Operation and Maintenance
CIWMB	Calif Integrated Waste Management Board
CPUC	Calif Public Utilities Commission
CSO	Combined Sewer Overflow
CTR	California Toxics Rule
CVCWA	Central Valley Clean Water Association
CWA	Clean Water Act
CWAP	Clean Water Action Plan
CWARA	Clean Water Authority Restoration Act
CWEA	Calif Water Environment Association
DHS	Dept of Health Services
DO	Dissolved Oxygen
DTSC	Dept of Toxic Substances Control
EBEP	Enclosed Bays and Estuaries Plan
EDW	Effluent Dominated Waterbody
EIS/EIR	Environmental Impact Statement/Report
EPA	Environmental Protection Agency
ERAF	Educational Reserve Augmentation Fund
ESMP	Electronic Self^Monitoring Report
FOG	Fats, Oils and Grease
GASB	Government Accounting Standards Board
HAP	Hazardous Air Pollutant
ISWP	Inland Surface Waters Plan
JPA	Joint Powers Authority
LA	Load Allocation (non^point sources)
LAFCO	Local Agency Formation Commission
LOCC	League of California Cities
LHC	Little Hoover Commission
MACT	Maximum Achievable Control Technology (air controls)
MCL	Maximum Contaminant Level
MGD	Million Gallons per Day
MMP	Mandatory Minimum Penalty
MOU	Memorandum of Understanding
MUN	Municipal Drinking Water Use
NACWA	National Association of Clean Water Agencies
NAS	National Academy of Sciences’
NGOs	Non Governmental Organizations
NOP	Notice of Preparation
NOX	Nitrogen Oxides
NPDES	Nat’l Pollutant Discharge Elimination System
NPS	Non^Point Source
NRDC	Natural Resources Defense Council
NTR	National Toxics Rule
OMB	Office of Management and Budget
ONRW	Outstanding National Resource Water
PAG	Public Advisory Group
PAHs	Polynuclear Aromatic Hydrocarbons
PCBs	PolyChlorinated Biphenyls
POTWs	Publicly Owned Treatment Works
PPCPs	Pharmaceutical and personal Care Products
PSSEP	Partnership for Sound Science in Environmental Policy
QA/QC	Quality Assurance / Quality Control
Region IX	Western Region of EPA (CA, AZ, NV & HI)
RFP	Request For Proposals
RMP	Risk Management Program
RFQ	Request For Qualifications
RO	Reverse Osmosis
RWQCB	Regional Water Quality Control Board
SCAP	Southern California Alliance of POTWs
SEP	Supplementary Environmental Projects
SERTs	Soluble or Extractable Regulatory Thresholds
SLAPP	Strategic Lawsuit Against Public Participation
SIP	State Implementation Policy (CTR/NTR criteria)
SRF	State Revolving Fund
SS	Suspended Solids
SSO	Sanitary Sewer Overflow
SSMP	Sewer System Management Plan
SWRCB	State Water Resources Control Board
TAC	Toxic Air Contaminant
TCLP	Federal Toxicity Characteristics Leaching Procedure
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
Tri^TAC	Technical Advisory Committee of CASA, CWEA, and LOCC
TSD	Total Solids Dissolved
TSO	Time Schedule Order
TSS	Total Suspended Solids
UPCCAA	Uniform Public Construction Cost Accounting Act
UV	Ultraviolet Treatment
VOCs	Volatile Organic Compounds
WAS	Waste Activated Sludge
WDR	Waste Discharge Requirements
WEF	Water Environment Federation
WERF	Water Environment Research Foundation
WET	Whole Effluent Toxicity or Waste Extraction Test
WESTCAS	Western Coalition of Arid States
WIN	Water Infrastructure Network
WLA	Waste Load Allocation (point sources)
WMI	Watershed Management Initiative
WRFP	Water Recycling Funding Program
WRDA	Water Resource Development Act
WWTP	Wastewater Treatment Plant
WQBEL	Water Quality Based Effluent Limitation
WQS	Water Quality Standards
WWWIFA	Water and Wastewater Infrastructure Financing Agency

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Georgean Vonheeder-Leopold - DIRECTOR
Dublin San Ramon Services District

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Chair – **Karri Ving**

SWRCB OPERATOR CERTIFICATION PROGRAM ADVISORY COMMITTEE APPOINTEES
Rick Staggs, Fresno-Clovis Regional Wastewater Plant
Levi Fuller, Dublin San Ramon Services District

STAFF MEMBERS

Roberta L. Larson
Executive Director

Greg Kester
Director of Renewable Resource Programs

Adam D. Link
Director of Government Affairs

Jessica Gauger
Manager of Legislative Affairs

Debbie Welch
Association Services Manager

Brooke Sobol
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Cheryl MacKelvie
Executive Assistant,
Meetings and Membership

CONSULTANTS

Eric Sapirstein
Federal Legislative Advocate

Michael F. Dillon
State Legislative Lobbyist

Sarah Deslauriers
Climate Change Program Manager

California Association of Sanitation Agencies

Federal Legislative Committee Agenda

Wednesday, January 18, 2017
4:15 p.m. – 5:15 p.m.
Palm Springs Hilton Hotel

COMMENCEMENT (4:15 – 4:25)

ITEM	PRESENTER
Call to order	Jim Colston
Welcome, introductions, roll call	Jim Colston
Review/approval of agenda	Jim Colston

A. PRIORITY ISSUES/ACTION ITEMS (4:25 – 5:00)

	ITEM	PRESENTER	ATTACHMENTS / NEXT STEPS
1.	Trump Administration Transition and Congressional Committee Assignments Updates	Eric Sapirstein	
2.	Water Infrastructure Improvements for the Nation Act (PL# 114-322) [Formerly WRDA]	Eric Sapirstein	- Final Legislation Brief Issue Summary **[Attached]** - Work with Committee on Appropriations and U.S. Bureau of Reclamation to support timely implementation and funding of infrastructure projects
3.	Review Items from December Planning Session	Jim Colston / Adam Link	- FLC Planning Session Notes and Action Items **[Attached]** - Transition Letter and Memo **[Attached]**
	Priority Issue: Citizen Suit Reform	Eric Sapirstein / Adam Link	Seek Sponsor/Cosponsors of legislation Seek introduction of legislation
	Priority Issue: Permit Term Extension	Eric Sapirstein / Adam Link	Seek Sponsor/Cosponsors of legislation Seek introduction of legislation
	Priority Issue: Infrastructure Assistance [SRF Funding Increase, National Infrastructure Policy]	Eric Sapirstein	Work with Congressional Delegation to secure full funding of SRF and ensure any new program assistance identifies wastewater needs.
4.	SRF Allocation Formula	Eric Sapirstein / Bobbi Larson	Work with CA water committee members to introduce allocation revision legislation

B. DISCUSSION ITEMS (5:00 – 5:10)

	ITEM	PRESENTER	NOTES
1.	Fiscal Year 2017 & 2018 Appropriations	Eric Sapirstein	- April 28 deadline for current year 2017 stopgap - September deadline for 2018 budget
2.	Energy Bill—Water Softeners	Eric Sapirstein	Monitor development of legislation
3.	Tax Reform	Eric Sapirstein / Bobbi Larson	Track any tax reform efforts for key CASA issues, including but not limited to revisions to definition of local agency, protection of tax exempt municipal bonds, tax credits for innovative technologies, and P3s.
4.	WIFIA	Eric Sapirstein	Status of implementation
5.	Other Regulatory Reform Initiatives	Eric Sapirstein	Track and report on any potential efforts to overturn the Clean Water Rule or modify other statutes (e.g. ESA, NEPA)

C. INFORMATIONAL ITEMS (5:10 – 5:15)

	ITEM	PRESENTER	STATUS
1.	Washington D.C. Policy Forum	Eric Sapirstein	Feb 27-March 1, 2017

CLOSING

New Business	
Next Meeting	TBD by Conference Call
Adjourn	

WATER INFRASTRUCTURE IMPROVEMENTS FOR THE NATION ACT OF 2016
SELECTED PROVISIONS

Title I, Program Reforms	PURPOSE	COMMENTS
Section 1181 Salton Sea	Makes Salton Sea pilot project a permanent program to restore Salton Sea .	Clerical change of status with no new funding authorized.
Section 1183 Coastal Engineering	Establishes a new priority to provide assistance to communities threatened by rising sea levels and shore damage.	Provides that engineering assistance can be made to support resilient coastal infrastructure among other activities. Amends existing law to give priority to projects that address rising sea level (includes shoreline restoration, tidal marsh restoration) and projects that protect coastal infrastructure. Beneficial use of dredged material emphasized.

WATER INFRASTRUCTURE IMPROVEMENTS FOR THE NATION ACT OF 2016
SELECTED PROVISIONS

Title II Water and Waste Act of 2016	PURPOSE	COMMENTS
Section 2109 Innovation in the Provision of Safe Drinking Water	Provides $50 million to support use of innovative technologies to reduce sources of drinking water contaminants including lead.	Assistance tied to technology assistance purposes.
Section 2202 Sense of Congress	Provides for first year WIFIA appropriation of $20 million.	Makes lead contamination activities eligible for WIFIA assistance.
Subtitle H Water Desalination	**PURPOSE**	**COMMENTS**
Section 3801 Reauthorization of Water Desalination Act of 1986	Renews law and funding to support USBR research into reducing energy consumptioN, managing chloride control, mitigting environmental impacts, improving RO and membranes, and improving energy recovery systems to reduce production costs. Focus of research is on drought declared states and communities, reduction on imported water, and where states have R&D programs. Requires coordination with other federal desalination programs.	Provides support to address chloride loadings into treatment systems as well as efforts to reduce overall impacts to environment. Funding provided in Subtitle J, California Water.

Subtitle F, Miscelleanous Provisions	**PURPOSE**	**COMMENTS**
Section 3603 Lake Tahoe Restoration	Provides for $415 million of which $150 million to support wildfire reduction, ecosystem restoration, municipal firefighting infrastructure $45 million to suppor invasive species management programs and $113 million for stormwater management controls.	Renews expired Lake Tahoe Restoration Act. Emphasizes wildfire suppression actions for funding assistance
Subtitle J California Water	**PURPOSE**	**COMMENTS**
Section 4009(a) Other Water Supply Project : Desalination	Authorizes USBR to fund 25% of total project costs of desalination. Eligible projects are brackish or ocean. $30 million assistance authorized.	Projects can only be provide assistance if appropriations bill names project for funding assistance.
Section 4009 (c) Water Recycling	Amends Title XVI to create new competitive grants assistance program for water recycling projects that have a project deemed feasible. $50 million authorizied.	Projects must be reviewed by USBR and submitted to Congress detailing any recommendations on projects that may be required for construction. USBR must issue criteria for project assistance reviews with priority established for projects that would increase water management flexibility, regional, multiple stakeholders, multiple benefits such as ecosystem benefits and water supply reliability. Projects must be named in appropriations bills to receive funding assistance.

Section 4009 (d) WaterSMART	Amends WaterSMART program to increase authorized funding from $350 million to $450 million ($100 million).	Of amounts authorized, $50 million is reserved to support development of storage facilities. Other assistance for a variety of conservation activities authorized including smart meters and data analytics.
Title IV Other Matters	**PURPOSE**	**COMMENTS**
Section 5008 WIFIA	Redefines projects eligible for WIFIA assistance. Clarifies that watershed projects that address drought resiliency can seek WIFIA assistance.	Clarifies that water recycling including alternative water supply projects and aquifer depletion are eligible for funding. Also clarifies that WIFIA fees may be rolled into WIFIA loan. In-kind costs prior to loan assistance are credited toward 51% non-WIFIA assistance.

CASA Federal Legislative Committee Planning Meeting
Action Items and Summary Notes

At our December 1, 2016 federal legislative committee planning session, CASA identified its federal legislative priorities for the year as well as other issues of interest that we will continue to track. At the outset, the committee stressed that CASA needs to have a very clear message and ask for the incoming administration on our highest priority issues.

Our federal issues generally fall into three primary categories: (1) regulatory reform (2) infrastructure policy and financing and (3) Clean Water Act modifications. Within these broader categories, the committee identified the following first tier, priority issues for the year:

- Increased Funding for the Clean Water State Revolving Loan (SRF) Fund
- Extension of NPDES Permit Terms
- Citizen Suit Reform

These items are explored further in the tables below as well as the associated action item slides.

<table>
<tr><th>Issue Category</th><th>Initiative</th></tr>
<tr><td>Infrastructure Financing</td><td>Increase of SRF Funding</td></tr>
<tr><td colspan="2">2017 Action Items</td></tr>
<tr><td colspan="2">▪ Consistent with a position statement from the incoming President-elect, CASA will request in the CASA transition memorandum and in future advocacy efforts a tripling of the Clean Water SRF allocation.
▪ CASA will continue to advocate for changes to the SRF allocation formula consistent with a recent report concluding California should get a greater share of the overall allocation.
▪ Where appropriate, CASA will continue to advocate for 40 year repayment schedules on specified projects and other favorable terms as needed in the SRF program.

Note: The highest priority item in this set is the increased funding piece. Also in our communications and advocacy, CASA will be sure to emphasize that this is a loan, not a grant, program and therefore the money has the advantage of coming back to the state and going to work again as future loans.

See associated action item slide for specific advocacy benefits, targets and strategies.</td></tr>
</table>

<table>
<tr><th>Issue Category</th><th>Initiative</th></tr>
<tr><td>Regulatory Reform</td><td>Extension of NPDES Permit Terms</td></tr>
<tr><td colspan="2">2017 Action Items</td></tr>
<tr><td colspan="2">▪ CASA will play a key role in introducing and pushing for passage of legislation to extend NPDES permit terms to 10 years.
▪ If there is a larger opportunity for broad regulatory reform, CASA will work to ensure that permit terms extension is included in that package.
▪ CASA will work with national associations including NACWA, the Association of Clean</td></tr>
</table>

Water Administrators, and possibly USEPA that could support reduced permit terms.
- CASA will refine its issue paper and talking points on the need for and merits of ten year permits, and will make this a discussion point at the Washington D.C. public policy forum, and include as a top priority in our transition memorandum.

Note: To the extent that legislation similar to H.R. 1623 (Rep. Sam Graves) from 2015-16 is reintroduced, which would extend NPDES permit terms to 20 years, CASA will evaluate its support based on our own advocacy.

See associated action item slide for specific advocacy benefits, targets and strategies.

Issue Category	Initiative
Clean Water Act Modifications	Citizen Suit Reform
2017 Action Items	
▪ Work with Rep. Duncan Hunter to reintroduce a version of H.R. 3353 (Rep. Duncan Hunter), gather other principal co-authors, and move the bill forward in 2017. ▪ Examine whether the approach in the bill could or should be more expansive in light of the current political environment. **See associated action item slide for specific advocacy benefits, targets and strategies.**	

Several other issues were brought to the committee's attention that may be of interest or require some involvement, as identified below:

Infrastructure Policy

Infrastructure policy and funding mechanisms appear to be a top priority for the incoming administration. The focus of the committee was how to get wastewater front and center in the general infrastructure policy discussion. Suggestions included a broader education component about the significance of wastewater financing needs and teaming with water groups in our advocacy. It was also suggested that we better identify priorities within our own industry, focusing on the new and innovative opportunities, not merely replacement of old infrastructure, while also stressing the importance of aging infrastructure repair and replacement. CASA will also stress areas where it is the role of the federal government to invest in local communities, and the importance of retaining existing cost effective tools and mechanisms for infrastructure funding (i.e. SRF, tax exempt bonds, etc.).

The committee suggested several infrastructure related initiatives for CASA to track and potentially support, many of which are important but none of which are as high of a priority as the SRF. These include the following positions and activities:

- CASA will remain supportive of the WIFIA program and work to ensure that the program is adequately funded and application requirements are reasonable, but only to the extent hat this new mechanism does not endanger any SRF funding.
- CASA will continue to track and work on improvements to the Title XVI program. Our efforts will focus primarily on reforms to the program, most

notably a position which states that approved projects must be able to move ahead without new appropriation, but will otherwise be broad in nature.

- CASA will continue to protect other existing vital programs and policies, such as tax-exempt municipal financing, if these issues arise as part of any future infrastructure policy and financing packages.
- CASA will reevaluate priorities and positions in light of whatever infrastructure policy package Congress and the president-elect release in the first 100 days, which could include items such as buy America bonds, public-private partnerships, and other items of note.

Regulatory Reform

The committee suggested CASA divide its regulatory reform initiatives into two tiers. The first tier includes our highest priority item (NPDES permit terms extension), but also potentially examining opportunities to enhance the viability and availability of mechanism such as compliance schedules and variances at the federal level. Second tier regulatory reform issues include addressing conflict of interest rules, protecting our existing exemptions within the waters of the United States rule to the extent the rule is reformed or repealed, and addressing opportunities related to climate change (though likely repackaged under different header). CASA will also check with its regulatory workgroup to identify their thoughts and suggestions regarding possible regulatory reform packages.

Affordability: NACWA has made affordability a key action item and platform for the coming year. CASA may support NACWA's efforts to the extent they align with our priorities, but will not make affordability a priority issue.

Water Recycling: CASA's advocacy on water recycling issues should focus purely on funding opportunities, and ensuring a balance of encouraging these projects but making sure it is not crowding out traditional projects.

Infrastructure Financing
Increase Funding for Clean Water State Revolving Fund (SRF) Program

Targeted Entities

- ✓ U.S. Environmental Protection Agency
- ✓ Congressional Representatives
  - ✓ CA Delegation
- ✓ Trump Administration

Value to CASA

- ✓ Preserves and expands the most important federal dedicated funding program
- ✓ Leverages Trump campaign pledge for SRF funding
- ✓ Addresses inequity of current SRF formula and increase CA share of SRF appropriation
- ✓ Enhances member ability to fund clean water and recycling projects based on actual project life cycles

Key Asks

- ✓ **Primary:** Triple Annual Funding for the Program
- ✓ Revise Allocation Formula
- ✓ Authorize 40 Year Loan Terms

Actions to Initiate

- ✓ Transmit CASA transition paper to USEPA appointees and Trump transition team highlighting this issue
- ✓ Revise and enhance existing talking points on SRF value
- ✓ Secure joint stakeholder letter of support for SRF funding and transmit letter of support to CASA agencies for use with delegation
- ✓ Work with congressional clean water committees to conduct follow-up hearings on allocation formula study findings
- ✓ Communicate with Trump transition team the importance of meeting his campaign pledge
- ✓ Draft and transmit letter of interest to congressional spending committees

Regulatory Reform
Extension of NPDES Permit Terms

Targeted Entities

- ✓ U.S. Environmental Protection Agency
- ✓ Congressional Representatives
  - ✓ Potential Sponsors
  - ✓ Rep. Sam Graves
  - ✓ Committees of Jurisdiction
- ✓ Trump Administration

Value to CASA

- ✓ Extended permit terms align permits to construction and life cycles of facilities
- ✓ Allows wastewater agencies to shift focus from frequent permit drafting and renewal to more important projects
- ✓ Longer period terms can protect some agencies from frivolous litigation

Key Asks

- ✓ Increase NPDES permit terms to 10 years.
- ✓ Introduce legislation to effect permit terms increase.

Actions to Initiate

- ✓ Transmit CASA transition paper to USEPA appointees and Trump transition team highlighting this issue
- ✓ Identify potential authors for 10 year permit terms legislation
- ✓ Reach out to Rep. Sam Graves to determine if he intends to reintroduce HR 1623 from 2015-16, which included a 20 year permit term provision.
- ✓ Revise CASA issue papers for use with Congressional Representatives
- ✓ Secure support from stakeholders
- ✓ Secure introduction of legislation
- ✓ Secure hearings once legislation introduced

Clean Water Act Modifications
Citizen Suit Reform

Targeted Entities

- ✓ Congressional Representatives
  - ✓ Rep. Duncan Hunter
  - ✓ Committees of Jurisdiction
- ✓ Trump Administration

Value to CASA

- ✓ Potential to reduce frivolous citizen suit litigation by adding defenses to the CWA, adjusting attorneys fees provisions, and making other changes.
- ✓ Continue to spotlight frivolous lawsuits filed by some attorneys against CASA members

Key Asks

- ✓ Enact Clean Water Act citizen suit reform to reign in frivolous lawsuits against local wastewater agencies.
- ✓ Introduce legislation resembling HR 3353 from 2015-16.

Actions to Initiate

- ✓ Transmit CASA transition paper to USEPA appointees and Trump transition team highlighting this issue
- ✓ Work with Representative Duncan Hunter to reintroduce a version of H.R. 3353, CASA's citizen suit legislation in the 2015-16 session.
- ✓ Gather other principal co-authors and move the bill forward in 2017.
- ✓ Gather support among others in the clean water community.
- ✓ Reexamine whether the approach outlined in HR 3353 could or should be more expansive or targeted.
- ✓ Revise CASA issue papers for use with Congressional Representatives
- ✓ Secure hearings once legislation introduced

CALIFORNIA ASSOCIATION of SANITATION AGENCIES

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December 28, 2016

President-Elect Donald J. Trump
Transition Headquarters
1717 Pennsylvania Avenue, NW
Washington, DC 20006

Dear President-Elect Trump,

On behalf of more than 100 members of the California Association of Sanitation Agencies (CASA), we offer congratulations on your election as the 45th President of the United States. For 60 years, CASA has been the leading voice for California's public wastewater agencies on regulatory, legislative and legal issues. We are an association of local agencies engaged in advancing the treatment and recycling of wastewater into usable water and other valuable resources. Through these efforts we help create a clean and sustainable environment for Californians.

The new congressional session and administration offer a unique opportunity to refocus the attention and resources of the federal government to achieve great things across the nation. CASA's clean water priorities are an ideal fit for the new Administration's emphasis on rebuilding America's infrastructure and bringing rationality and pragmatism to our federal regulatory regime. As we welcome you to office, we want to take this opportunity to highlight three essential priorities for the California wastewater community, as well as other important elements to be included in any federal water infrastructure policy and regulatory reforms. Our shared goal is to make the changes needed to rebuild America's aging water and wastewater infrastructure and bring the Clean Water Act into the 21st century.

A number of issues central to the future of water quality and water supply needs demand attention given the absence of comprehensive reform of the Clean Water Act since 1987. There is a significant and immediate need to upgrade this nation's water and wastewater infrastructure, a need that will only be exacerbated by unpredictable climactic conditions that can result in adverse impacts to existing water infrastructure performance. As such, CASA requests your attention to three high priority actions for the Administration and Congressional leaders in the coming session.

(1) Triple Funding for the Clean Water State Revolving Loan Fund (SRF) Program
(2) Extend Clean Water Act Permit Terms from Five Years to Ten Years
(3) Enact Reasonable Clean Water Act Citizen Suit Reforms

Additional detail regarding each of these critical issues is provided in the attached briefing paper. We appreciate the Administration's consideration of CASA's clean water priorities and look forward to working with the Administration and Congress in the coming year to effect meaningful change.

Thank you,

Jeff M. Moorhouse

Jeff M. Moorhouse
President

CALIFORNIA ASSOCIATION of SANITATION AGENCIES

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Priorities for the New Administration and Congress 2017

As the new Administration and 115th Congress begin work, CASA presents the following issues that must be addressed as part of the nation's commitment to modernize its antiquated water infrastructure and reform the government's approach toward the regulated community.

1. Triple Funding for the Clean Water State Revolving Fund (SRF) Loan Program

The Administration has made clear that infrastructure funding, including clean water infrastructure, is crucial to our country's future. Specifically, during the campaign there was a commitment to:

> "Make clean water a high priority. Develop a long-term water infrastructure plan with city, state and federal leaders to upgrade aging water systems. Triple funding for state revolving loan fund programs to help states and local governments upgrade critical drinking water and wastewater infrastructure."

CASA whole-heartedly agrees with this assessment and asks the Administration to follow through on its pledge to triple funding for the SRF program in order to upgrade crucial wastewater infrastructure. The SRF program is one of the most important and effective clean water infrastructure financing tools available today, and has the added advantage of being a loan, not a grant, program, meaning the outgoing money will ultimately come back to the states to be loaned again for future projects.

While increased funding of the Clean Water SRF is our first priority, CASA suggests other changes to the SRF program that would help local agencies to better address wastewater needs, including authorization of up to 40-year repayment terms for these loans and changes to the allocation formula among the states. Some of these minor modifications are highlighted in the regulatory reform discussion below.

2. Enact Sensible Regulatory Reform by Extending Clean Water Act Permit Terms to Ten (10) Years

For far too long, the administrative regime governing businesses and municipalities subject to Clean Water Act permitting requirements has operated under an outdated and inefficient renewal model. The Clean Water Act currently requires entities discharging to waters of the United States to obtain National Pollutant Discharge Elimination System (NPDES) permits that contain enforceable discharge limits. These permits are issued for 5-year terms and must be renewed or extended administratively every five years. Yet the design and construction of wastewater treatment infrastructure often occurs over the course of a decade, and once completed the life cycle of a project can extend to 40 or 50 years, far exceeding the term of a permit. As a result, many public wastewater agencies have not yet completed the upgrades necessary to comply with their prior permit when they are hit with brand new terms and requirements.

The nation's wastewater agencies currently face increasingly restrictive and compounding regulatory requirements that push the limits of technology and local agency budgets. At the same time, the current Clean Water Act mandate to renew complex permits every five years represents a perpetual "moving target" that achieves very little in the way of water quality benefits. The water quality needs of today require new ways of doing business to bring innovation to the way we make water quality improvements. Extending permit terms beyond the current five-year window is one important step toward this new approach.

The Clean Water Act should be amended to allow for ten-year NPDES permit terms. Providing for a longer NPDES permit term would allow for enhanced planning and efficient permitting of facilities and give agencies the time needed to comply with existing requirements before jumping to new ones. At the same time, standard permit reopener provisions already provided for by regulation would allow for new conditions to be inserted if necessary prior to permit expiration.

3. Stop Abusive “Environmental” Lawsuits by Enacting Reasonable Clean Water Act Citizen Suit Reform

Over the last decade, a cottage industry has developed in California and elsewhere in which a small number of plaintiffs’ lawyers are abusing the Clean Water Act’s citizen suit provisions to secure settlements requiring significant expenditure of public and private dollars without corresponding environmental or public health benefits. These tactics are costing local agencies and small businesses millions of dollars in settlements and legal fees.

Congress provided authority in the CWA to citizens to initiate litigation when a state or federal enforcement agency fails to diligently pursue an alleged violation. While an important tool in concept (and at times, in practice), in recent years the use of these citizen suit provisions has frequently generated litigation that is motivated by a desire to secure settlements at great cost to public agencies and small businesses and results in little if any benefit to the environment.

Citizen suit reform should be a top priority for CWA legislation. CASA has worked with Congress to address this matter through a series of reasonable reforms that bring balance to the way such litigation is pursued and guarantee that incentives that promote frivolous and baseless litigation are curbed. Specifically, CASA’s proposed reform package must:

(1) ensure attorneys’ fees awards are appropriate to local markets and commensurate with the proportion of successful claims in each case;
(2) provide for normally accepted criminal and standard defenses to the Clean Water Act; and
(3) clarify the definition of “diligent prosecution” of alleged violations, allowing state and federal authorities to exercise their primacy in enforcement and preventing unnecessary citizen suit intervention.

These tailored amendments maintain the vitality of the CWA citizen suit provision as it was originally intended while preventing abuses that are costing the regulated community, including local public agencies, millions of dollars in settlements and legal fees. CASA anticipates working with Congress and your Administration to advance into law these common sense reforms.

Other Specific Requests and Considerations

The items above are significant priorities for the California wastewater communities and should be the first actions considered by your Administration. However, a myriad of other important issues could be included as part of a larger infrastructure funding package or broader regulatory or Clean Water Act reform efforts.

Funding of Current and Future Federal Water Infrastructure Programs

Your Administration and Congress are expected to make infrastructure policy a top priority. Any future infrastructure initiatives should include a core principle of expediting federal assistance and minimizing delays in the award of federal funding. Going forward, the Administration must ensure that a wide array of funding options continues to be provided to state and local clean water agencies, including: grant programs, SRF loans, and other attractive features such as loan guarantees, enhanced subsidies, extended terms of amortization, negative interest loans, loan forgiveness, unrestricted use of private activity bonds (PABs) for water projects, Build America Bonds (taxable bonds with 35% cash subsidy to issuing agency), Public Private Partnerships (P3s), and combining any and all of the above programs to finance full project costs. In addition, mandates such as Buy America should not be imposed on public projects as a condition of any of these programs because they unnecessarily increase project costs and create delays.

Several proposals for new or existing programs have been floated in recent years, including:

- **Infrastructure Bank:** The iBank has been discussed as an option for potentially meeting the funding gap of many public infrastructure needs. While the iBank concept could be beneficial if implemented properly, the Administration should ensure that the policy governing such a program contains an appropriate and unwavering commitment to address water infrastructure needs and to avoid inadequate funding commitments to water in preference for roads, ports, airports, and other infrastructure needs. In addition, the development of an iBank must be additive: it cannot substitute for or jeopardize any other funding programs currently in existence.

- **SRF Program Changes:** As noted above, increasing funding for the Clean Water SRF program should be the Administration's top water priority. However there are other changes recommended to benefit the program, including:
    - There should be specific limits on the percentage of appropriated funds that can be authorized for transfer between clean water and drinking water SRFs;
    - States should be given the flexibility to authorize up to 40-year repayment terms for these loans depending upon the useful life of the facilities;
    - The SRF allocation formula must be revised to reflect findings of a recent USEPA review of inequities in the current formula.

- **WIFIA:** The Water Infrastructure Finance and Innovation Act (WIFIA) is a new and potentially valuable program to finance wastewater infrastructure. USEPA is currently developing the parameters of the program, but as the program moves forward the Administration and Congress should ensure that WIFIA assistance be provided with minimal red tape and lower than market administrative fees to avoid delays and disincentives for use. Most importantly, the Administration and Congress should ensure that WIFIA funding assistance does not cannibalize or otherwise detract from the Clean Water SRF program. In addition, WIFIA assistance should be made available up to 100% of a project cost.

- **Title XVI Funding (Recycled Water Project Grants):** As Congress and the Administration consider revisions to water infrastructure policy, full support of the Title XVI program at the Bureau of Reclamation is necessary as it is the sole dedicated program to promote water recycling. Federal funding policies should recognize that, in many circumstances, the distinction between water quality and water supply needs is an artificial distinction. Sustainable water supply through enhanced water recycling is crucial to states in the arid west. Historically, Congress has funded USBR's Title XVI to support a number of authorized projects. However, many of these approved projects get hung up in the appropriations process and are never realized. This process should be revised to allow for funding of projects deemed feasible by the Secretary of the Interior without separate approval or appropriation. In addition, a funding level of $30 million should be made available to support completion of ongoing projects as well as to promote innovations through the WaterSmart Program.

Regulatory Reform

Meaningful regulatory reform, particularly in the water and wastewater sector, has historically been a third rail of policymaking. At the same time, the world has changed and the public health and environmental protection needs of our nation require a new model to protect against excessive compliance costs and foster effective rulemaking.

- **Conflicts of Interest Test:** Existing Clean Water Act regulations provide for appointment to state permitting authorities using a standard based upon an individual's source of income. If an individual (or a direct family member) receives 10% or more of his or her annual income from an NPDES permit holder (or applicant), he or she is disqualified for consideration for appointment to a permitting authority. This overly restrictive standard effectively bars qualified individuals from consideration even if there is no indication or evidence of a real conflict of interest. Instead, the rules should ensure that no official participates in a decision in which he or she has a direct or indirect financial interest. As part of any Clean Water Act regulatory reform, the Administration and Congress should amend the Clean Water Act to require a true conflict of interest test as is used in other federal and state programs.

- **Creation of a Federal Clean Water Advisory Council:** The USEPA Office of Water lacks a formal mechanism to ensure technical input from the regulated water quality community. Congress should establish a National Clean Water Advisory Council, similar to the National Drinking Water Advisory Council, composed of technically qualified members drawn from the regulated community, and other stakeholders, to provide input on rulemaking developments and other policy initiatives.

- **Affordability and Integrated Planning:** As complex regulatory requirements imposed on municipalities and businesses become more and more expensive to implement, these costs are ultimately passed on to local ratepayers and consumers, many of whom are economically distressed and can ill afford these new burdens. The Administration should examine ways to examine affordability, including consideration of programs to assist low-income ratepayers and find ways of prioritizing or relieving certain regulatory requirements (including but not limited to integrated planning) in order to lessen the financial impact on these communities. These are also priorities of the National Association of Clean Water Agencies (NACWA) and many others in the clean water community, and CASA supports those initiatives.

Any policy changes pursued by the Administration and Congress must be grounded in flexibility. Too often outmoded regulatory regimes and restrictive financing mechanisms can stifle innovation and not allow local agencies to fulfill their potential in the pursuit of protecting public health and the environment. We hope that the incoming Administration's emphasis on rebuilding America's infrastructure and pursuing meaningful regulatory reform will help local wastewater agencies overcome these barriers.

We appreciate your Administration's consideration of CASA's clean water priorities and look forward to working with your Administration and Congress in the coming year to effect meaningful change.

2017 TWO-YEAR STRATEGIC PLAN

This document provides a summary of the Bay Area Biosolids to Energy (BAB2E) Coalition's achievements to date, the key drivers behind the Coalition's desire and need to diversify biosolids management options beyond land application, and the Coalition's plan for the next two years to further diversify in the face of regulatory developments requiring the eventual elimination of one of the Bay Area's most prevalent biosolids options - alternative daily cover (ADC) at landfills.

Why did the BAB2E Coalition form?

The Coalition originally formed in 2004 when a group of agencies came together to evaluate the feasibility of a regional biosolids management project to avoid the threat of a potential ban on land application of biosolids. By 2008, the membership expanded and the group decided to officially brand itself the BAB2E Coalition to take advantage of opportunities anticipated to be developed under new state legislation (specifically, Assembly Bill 32 or AB 32). Assembly Bill 32 requires the state to reduce greenhouse gas (GHG) emissions to 1990 levels by 2020 (with further reduction by 2050). To achieve GHG reductions, the state created numerous programs incentivizing renewable energy and low carbon fuel production. This legislation served as a driver to prioritize the conversion of biosolids to energy over other Class A or B options, which also satisfies the Solano County Code requirements for land application of biosolids (Chapter 25, Article IV, Sec. 25-400), specifically:

> "Class B biosolids may only be land applied provided that the generator of the Class B biosolids is individually or as part of a consortium having a portion of their biosolids produced as Class A Exceptional Quality biosolids, **converting biosolids to energy**, or otherwise diverting Class B biosolids away from land spreading or landfilling (as waste or as Alternative Daily Cover)."

What has the BAB2E Coalition accomplished to date?

The Coalition began by investigating a single regional merchant facility to be located centrally among Coalition members. With diligent review and evaluation, this approach was found to have practical and environmental limitations - including being a single management option resulting in GHG emissions from the truck transport required to haul member agency solids to the facility. The lessons learned from that process, along with the evolving legislation[1], resulted in member agencies deciding to initiate evaluations of and hosting subregional projects that look beyond converting biosolids to energy. The projects are seeking to understand all benefits from the use of biosolids and to responsibly recycle back to the environment value-added products of biosolids (including conversion to energy). At the same time, these projects are diversifying biosolids management options beyond land application (i.e.,

[1] Legislation that has been adopted over the past 10 years (since AB 32) targeting the reduction of GHG emissions and, in turn, driving a change in biosolids management is summarized in a separate document. Refer to the BAB2E Legislative Road Map.

landfilling or land applying Class B biosolids in Solano County) to ensure Bay Area agencies have local, sustainable year-round options available.

This approach not only provides for year-round diversification of biosolids management options, it also provides the opportunity to demonstrate how well each option contributes toward achieving state goals, introduced by the Governor in 2015, to further reduce statewide GHG emissions by 2030 (going beyond AB 32's 2020 targets). These goals (also referred to as the Governor's "five pillars") are:

- Reducing today's petroleum use in cars and trucks by up to 50 percent
- Increasing from 33 to 50 percent our electricity derived from renewable sources
- Doubling the energy efficiency savings achieved at existing buildings and making heating fuels cleaner
- Reducing the release of methane, black carbon, and other short-lived climate pollutants
- Managing farm and rangelands, forests and wetlands so they can store carbon

POTWs have the ability to contribute toward several of the Governor's pillars in a single project, and POTWs serve as the backbone of a community's resiliency in the face of changing conditions. Currently there are six subregional projects being investigated by five member agencies with the objectives of demonstrating viable, year-long (weather resilient) alternatives to land application that look beyond "biosolids to energy" and seek to responsibly recycle back value-added products of biosolids to the environment. Table 1 provides a summary of these subregional efforts.

Table 1 Active Coalition Member Agency Projects

Member Agency	Project	Partner(s)
Fairfield-Suisun Sewer District	Regional-scale project accepting biosolids as of August 2016 to produce a licensed liquid biofertilizer referred to as LysteGro.	Lystek International
Silicon Valley Clean Water	Full-scale demonstration of the BioForceTech Biodryer to begin taking biosolids in Fall 2016, then followed by pyrolysis at a near-future date, to produce syngas and biochar.	BioForceTech
West County Wastewater District	Planned Synagro/SCFI Hydrothermal Oxidation project taking waste activated sludge to produce syngas and a small volume of inert material.	SCFI & Synagro
Dublin San Ramon Services District	Planned Synagro/SCFI Hydrothermal Oxidation project taking biosolids to produce syngas and a small volume of inert material.	SCFI & Synagro
Delta Diablo	Partnership with Mt. Diablo Resource Recovery (MDRR) to evaluate gasifying biosolids and wood waste to produce syngas and biochar.	MDRR & PHG Energy
Delta Diablo	Partnership with MDRR to evaluate co-digesting solids and food waste prior to processing the material in Anaergia's pyrolysis technology to produce additional biogas and biochar.	MDRR & Anaergia

In addition to the pursuit of the single merchant facility and the ongoing support provided to the six subregional projects, the Coalition has and will continue to provide ongoing support and advocacy to:

- Educate the public on biosolids management issues in California through public outreach efforts, including the creation of a public website and securing media coverage.
- Serve as a technology incubator – particularly for pre-commercial technologies.
- Support land application in the Bay Area by seeking to create more capacity for biosolids in the Bay Area marketplace.
- Advance the industry and legislative state of knowledge on biosolids as a valuable resource.

Advocacy Achievements

The Coalition has utilized advocates to advance the discussion and education of biosolids with legislators and regulatory agencies, underscoring the importance of funding. The achievements of the federal and state advocacy consultants to date are summarized below.

Federal Advocacy

- Secured U.S. Department of Energy (DOE) solicitation for competitive project proposals dedicated to biopower from biosolids.
- Developed/coordinated a joint delegation letter of support and a letter of support from Senator Feinstein for project submissions to the U.S. DOE Secretary - through active lobbying and education, Senator Feinstein has become an advocate for the beneficial use of biosolids and will likely become the chair of the Energy and Water subcommittees that oversee the California Energy Commission (CEC) budget, which provides incentive funds for biosolids projects.
- Worked successfully with the Senate Committee on Appropriations to advocate support for bioenergy initiatives outside of the transportation sector.
- Worked to achieve budget allocation of a minimum of $10 million (FY 2017) for bioenergy needs (pending Lame Duck Session).
- Arranged for meetings with Members of Congress, congressional committee staff, and stakeholders to advance Coalition objectives.
- Worked with members of the House Committee on Science to advance budget priority for biosolids to energy projects.
    - Developed talking points for use in formal testimony on FY 2017 budget priorities.
    - In response to committee hearing questions, the Secretary of Energy detailed commitment to provide budgetary resources to support competitive grants solicitation for biosolids projects.
- Provided support to Coalition staff related to press materials and general briefing materials.

State Advocacy

- Educated state legislators on biosolids and the concept of biosolids to energy – extending that education to the CEC and the Governor's Office.
- Obtained $1 million Public Interest Energy Research (PIER) grant from CEC (previously opposed) to research biosolids to energy technology.
- Examples of Bay Area legislative support gained through advocacy include:

  - Senator Wieckowski's SB 1213 (2016), coauthored by 10 Bay Area legislators, increased the notoriety and profile of BAB2E Coalition issues/objectives in the legislature.
  - Bay Area Legislative Caucus wrote two letters to legislative leadership explaining that funding BAB2E projects is a priority (2015 and 2016).
- Obtained language establishing and funding a CEC grant program in the 2016 Cap-and-Trade spending plan. While the funding was removed from the spending plan in the final hours, the process of lobbying for the funding resulted in several positive outcomes including:
  - Assisting BAB2E members in establishing and further developing relationships with legislators.
  - Reestablishing the Coalition's relationship with CEC.

Critical Challenges (and Unmet Needs) Today

The Coalition's pursuit of an all-weather biosolids management option in 2008 was driven by AB 32 and the continued threat to Class B land application in the Bay Area, particularly in Solano County. Over time, the Coalition has identified new critical challenges and unmet needs as legislation has developed and the environmental landscape is evolving. The critical near-, mid-, and long-term challenges identified by the Coalition in 2016 are summarized in Table 2.

Table 2	**Critical Challenges/Unmet Needs Identified by the Coalition in 2016**
Term	**Challenge or Unmet Need to Address**
Near	• The elimination of alternative daily cover (ADC) at landfills as a biosolids management option. • The need to diversify biosolids management options and vendors. • The need for a year-round option. • The need for a well-attended influential forum to advocate for and support each other in the development of diverse biosolids management options, creation of value-added products, and contributing to the overall sustainability of the environment. • The need for regulatory advocacy.
Mid to Long	• The need for external academic collaboration to provide the scientific backing in documenting the value-added products derived from biosolids and their uses. • The need to continue educating the public (elected officials, state agencies, cities, etc.) on the beneficial uses of biosolids and how those uses can help the state and cities achieve their environmental goals. • The need for the wastewater sector to take ownership in managing biosolids.

Looking Ahead: Two-Year Strategic Plan

Mission Statement:

"Develop a Diverse and Robust Portfolio of Beneficial Biosolids Resource Recovery Projects for the San Francisco Bay Area"

To take action on these critical challenges and unmet needs and continue pursuing the Coalition's Mission Statement, the Coalition has decided to develop a Two-Year Strategic Plan identifying specific objectives, and tasks/deliverables or services to address each need.

The Coalition has positioned itself to address what member agencies see as today's critical challenges and unmet needs (Table 2). These challenges and needs serve as the basis for the development of a Strategic Plan and must be resolved to ensure long-term, sustainable biosolids management practices are available to all in the Bay Area and, in turn, across the U.S. as regulations become more restrictive in other states.

This section serves as the Coalition's Two-Year Strategic Plan, which requires an active, influential forum to carry out its mission. It is a two-year plan at this time in order to evaluate and re-establish the governing structure of the Coalition. The intention is to mature into a five-year plan as the Coalition adopts a governing structure for moving forward.

The objectives for the two-year plan in order to address the critical challenges and unmet needs are to:

- Evaluate and select three or more all-weather (year-round) biosolids end use management options
- Provide ongoing support to active Coalition projects being undertaken at Bay Area Wastewater Resource Recovery agencies
- Develop partnerships with academia to advance biosolids research
- Continue serving as a technology clearinghouse and develop strategies to promote being a Technology Incubator for biosolids projects
- Develop a strategy for legislative advocacy
- Develop a strategy for governance and funding the Coalition
- Continue and expand community outreach and education regarding the value of biosolids products

Connecting the Coalition's Near- and Long-Term Critical Challenges/Unmet Needs with its Objectives

Table 3 provides the link between the critical challenges and unmet needs identified by the Coalition member agencies and the Coalition objectives, and also attempts to list the near- and long-term activities (i.e., tasks, deliverables, and services) required to address them over the next two years. Figure 1 is a schedule showing several key actions to be accomplished in early 2017 in support and pursuit of achieving the Coalition's objectives over the next two years. Target dates for each key action are shown and can be adjusted as necessary.

Table 3 Coalition Activities Required Over Next Two Years to Address Critical Challenges/Unmet Needs and Objectives		
Objective	**Critical Challenge/ Unmet Need Addressed**	**Task/Deliverable/Service**
Evaluate and select three or more all-weather (year-round) biosolids end use management options in the Bay Area	• Elimination of ADC at landfills • Diversify biosolids management options and vendors • Identify all-weather year-round options	• Quantify capacity available in existing projects and capacity needed • Develop schedule of workshops/meetings to identify (solicit ideas/proposals from industry) and evaluate options • Establish criteria for comparing options (begin with draft list from previous planning session) • Evaluate feasibility (application of criteria) and cost of options
Provide ongoing support to active projects being undertaken at Bay Area Wastewater Resource Recovery agencies	• Diversify biosolids management options and vendors • Identify all-weather year-round options • Influential forum to advocate for and support each other	• Provide as-needed engineering support • Evaluate performance in meeting goals/ objectives • Outreach regarding achievements • Coordinate and maintain information/data share on the Coalition's Sharepoint site (internal website)
Develop partnerships with academia to advance biosolids research	• Influential forum to advocate for and support each other • Academic collaboration	• Create targeted list of biosolids researchers at universities • Create member subcommittee to: – Lead focused effort to establish/ facilitate relationships with academia – Identify gaps in research to better understand current biosolids product (chemical constituents, pathogens, microorganisms, nutrients, etc.) and future product markets (energy, fuel, soil, storage, etc.) – Further develop literature/data storage sharing structure on Sharepoint (internal Coalition website)
Continue serving as a technology clearinghouse and develop strategies to promote being a Technology Incubator for biosolids projects	• Diversify biosolids management options and vendors • Influential forum to advocate for and support each other • Taking ownership	• Provide as-needed technical review • Further develop and share database of information on technologies and niche markets for biosolids on Sharepoint • Update the RFI questions posted on the Coalition's external website to address the expanded scope (looking beyond biosolids to energy projects and the Bay Area) • Further develop partnerships with other industries • Develop clear strategy for Coalition's role as a resource to non-member agencies

Develop a strategy for legislative advocacy	• Legislative/regulatory advocacy	• Develop clear goals for legislative advocacy efforts (legislative, regulatory, and funding) • Create member subcommittee to direct advocacy efforts • Join the Bioenergy Association of California to supplement efforts • Coordinate with the California Association of Sanitation Agencies to leverage lobbying/regulatoryefforts
Develop a strategy for governance and funding of the Coalition	• Taking ownership	• Establish Governance Structure including clear definitions for the Program Manager, Executive Board, Steering Committee, and Subcommittees • Modify the name of the Coalition to reflect the expanded scope (looking beyond biosolids to energy projects and the Bay Area) • Promote the Coalition to non-member agencies
Continue and expand community outreach and education	• Influential forum to advocate for and support each other • Educating the public	• Develop strategy with specific goals for expanding community outreach efforts • Coordinate 1-page updates for active Coalition projects to share on the website

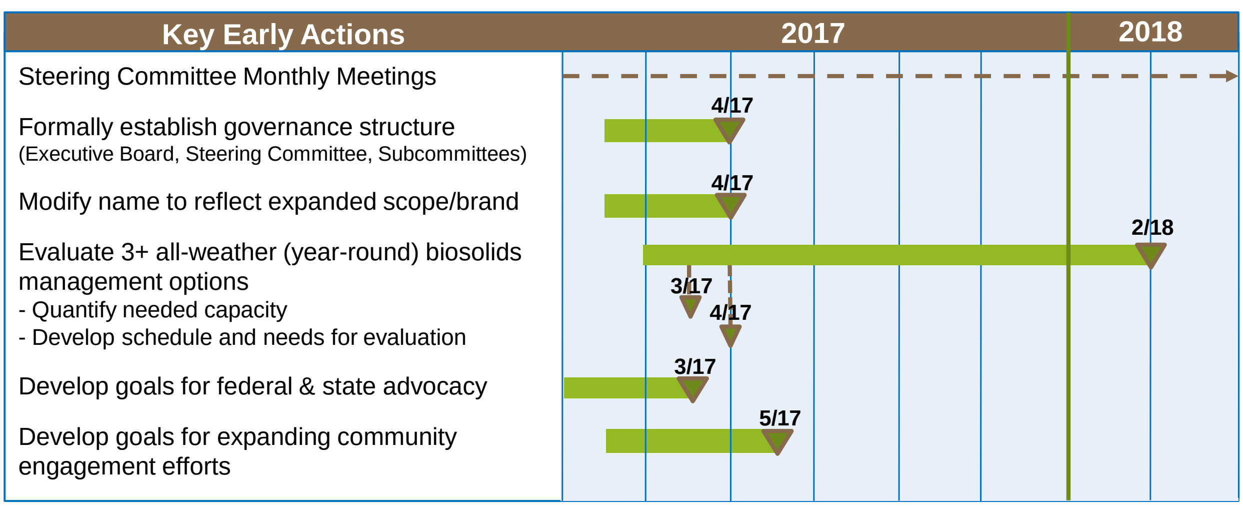


Figure 1. Key Actions for the Coalition to Accomplish in Early 2017

To achieve the objectives of the Strategic Plan, the Coalition must:

- **Build Relationships** - among members, local governments (e.g., Solano County), academia, legislature, state agencies, elected officials, public stakeholders, solid waste management organizations, etc.
- **Achieve Project Maturity** - gain from the experiences of the six existing subregional projects
- **Promote Product Development** - continue to identify/develop technologies and other biosolids end use products other agencies can replicate

The intent of the Coalition is to provide its member agencies not only the continued legacy it has already established and the opportunities it has already opened to the wastewater community, but also an extended network of resources, experts, support, and access to the selected all-weather management options/technologies the Coalition identifies as viable.

State Legislative Committee Agenda

Friday, January 20, 2017
8:00 a.m. – 9:00 a.m.
Palm Springs Hilton
Plaza Ballroom

COMMENCEMENT

	Presenter
Call to order	T. Minamide, Chair
Welcome, introductions	T. Minamide, All
Review/approval of agenda	All

A. ORGANIZATIONAL ITEMS (8:00-8:10)

	ITEM	DESCRIPTION	LEAD	POSITION/NOTES
1.	Update on Policy Committee Chairs	Changes to committee chairs and rosters in Senate and Assembly	J. Gauger	

B. PRIORITY LEGISLATIVE ISSUES (8:10-8:40)

	ISSUE	DESCRIPTION	LEAD	POSITION/NOTES
1.	SB 163 (Hertzberg) version 2.0	Update on discussions with Senate staff and advocacy coalition	J. Gauger A. Link M. Dillon	
2.	WateReuse potable reuse legislative proposal	Review of language and report on vetting proposal	A. Link B. Larson	Draft language attached
3.	Request for CASA to Co-sponsor biomass conversion definition bill	Review of language and report on vetting proposal	J. Gauger S. Green	Draft language attached

C. OTHER LEGISLATIVE ISSUES (8:40-9:00)

	ISSUE	DESCRIPTION	LEAD	POSITION/NOTES
1.	Little Hoover Commission hearings on special districts	Update on direction of report	J. Gauger	Letter from LHC
2.	Budget items of interest	Overview of Governor's proposed Budget: Cap & Trade and other issues of interest	J. Gauger	Budget summary pages included
3.	Stormwater proposals from L.A. working group	Package of legislative proposals on various stormwater issues	J. Gauger S. Green	See attached overview

CLOSING

Next Meeting	March 10, 2017 – 10:00 a.m. – 1:00 p.m. (In person) Carollo Engineers Conference Room, Sacramento, CA
Adjourn	

Key Committees that hear CASA Issues

Assembly Committees:

Assembly Appropriations Committee
Chair: Lorena Gonzalez-Fletcher

Assembly Environmental Safety and Toxic Materials Committee
Chair: Bill Quirk*

Assembly Local Government Committee
Chair: Cecilia Aguiar-Curry*

Assembly Natural Resources Committee
Chair: Cristina Garcia*

Assembly Utilities and Energy Committee
Chair: Chris Holden*

Assembly Water, Parks & Wildlife Committee
Chair: Eduardo Garcia*

Senate Committees:

Senate Appropriations Committee
Chair: Ricardo Lara; Vice Chair: Pat Bates

Senate Energy, Utilities and Communications Committee
Chair: Ben Hueso;Vice Chair: Mike Morrell

Senate Environmental Quality Committee
Chair: Bob Wieckowski; Vice Chair: Andy Vidak

Senate Governance and Finance Committee
Chair: Mike McGuire*; Vice Chair: Janet Nguyen

Senate Natural Resources and Water Committee
Chair: Bob Hertzberg*; Vice Chair: Jeff Stone

*Newly Appointed as Chair for 2017

DRAFT 12-20-16
Chapter 7.3. ~~Direct and Indirect~~ Potable Reuse

13560. The Legislature finds and declares the following:

(a) In February 2009, the state board unanimously adopted, as Resolution No. 2009-0011, an updated water recycling policy, which includes the goal of increasing the use of recycled water in the state over 2002 levels by at least 1,000,000 acre-feet per year by 2020 and by at least 2,000,000 acre-feet per year by 2030.

(b) Section 13521 requires the ~~department~~ state board to establish uniform ~~statewide~~ water recycling criteria for each varying type of use of recycled water where the use involves the protection of public health.

~~(c) The use of recycled water for indirect potable reuse is critical to achieving the state board's goals for increased use of recycled water in the state. If direct potable reuse can be demonstrated to be safe and feasible, implementing direct potable reuse would further aid in achieving the state board's recycling goals.~~

~~(d) Although there has been much scientific research on public health issues associated with indirect potable reuse through groundwater recharge, there are a number of significant unanswered questions regarding indirect potable reuse through surface water augmentation and direct potable reuse.~~

(c~~e~~) Achievement of the state's goals depends on the timely development of uniform water recycling criteria for ~~indirect and direct~~ potable water reuse and a clear pathway for approval of potable reuse projects.

(d~~f~~) This chapter is not intended to delay, invalidate, or reverse any study or project, or development of regulations by the department, the state board, or the regional boards regarding the use of recycled water for ~~indirect~~ potable reuse~~. for groundwater recharge, surface water augmentation, or direct potable reuse~~.

(e~~g~~) This chapter shall not be construed to delay, invalidate, or reverse the ~~department's~~ state board's ongoing review of projects consistent with Section 116551 of the Health and Safety Code.

(f) The water recycling goals of 700,000 acre-feet of water per year by the year 2000 and 1,000,000 acre-feet of water per year by the year 2010, which were adopted in Water Code Section 13577, have not been met.

(g) It is the intent of the Legislature to encourage the development of potable reuse to mitigate the impact of long-term drought and climate change.

(h) A 2014 report by the WateReuse Research Foundation, " The Opportunities and Economics of Direct Potable Reuse" found that potable reuse could provide up 1.1 million acre-feet per year of new drinking water supplies for California.

Chapter 7.3. ~~Direct and Indirect~~ Potable Reuse

13560. The Legislature Finds and Declares the following:

(a) It is the intent of the Legislature to require the state board to take actions that will lead to the attainment of the recycling goals adopted in Water Code Section 13577 that were not met; 700,000 acre-feet of water per year by the year 2000 and 1,000,000 acre-feet of water per year by the year 2010. (disagreement on this finding/too negative need to reword)

(b) The state board encourages the development of new water supplies and under utilized water supplies to mitigate the impact of long-term drought and climate change.(can we make a stronger statement??)

(c) In February 2009, the state board unanimously adopted, as Resolution No. 2009-0011, an updated water recycling policy, which includes the goal of increasing the use of recycled water in the state over 2002 levels by at least 1,000,000 acre-feet per year by 2020 and by at least 2,000,000 acre-feet per year by 2030.

(d) A 2014 report by the WateReuse Research Foundation, " The Opportunities and Economics of Direct Potable Reuse" found that potable reuse could provide up 1.1 million acre-feet per year of new drinking water supplies for California.

(e) Section 13521 requires the ~~department~~ state board to establish uniform statewide recycling criteria for each varying type of use of recycled water where the use involves the protection of public health.

(f) Achievement of the state's goals depends on the timely development of uniform statewide recycling criteria for ~~indirect and direct~~ potable ~~water~~ reuse.

(g) The state board adopted potable reuse regulations for the replenishment of groundwater basins in 2014 and is developing potable reuse regulations for the augmentation of surface water reservoirs pursuant to Section 13562.

(h) The state board report to the Legislature titled "Investigation on the Feasibility of Developing Uniform Water Recycling Criteria for Direct Potable Reuse (DPR)" found that it is feasible to develop statewide regulations for Direct Potable Reuse that are protective of public health.

(i) The state board report to the Legislature stated that the state board would develop a common framework across the various types of direct potable reuse projects to help avoid discontinuities in the risk assessment and then develop statewide regulations sequentially.

~~(d) The use of recycled water for indirect potable reuse is critical to achieving the state board's goals for increased use of recycled water in the state. If direct potable reuse can be demonstrated to be safe and feasible, implementing direct potable reuse would further aid in achieving the state board's recycling goals.~~

~~(e) Although there has been much scientific research on public health issues associated with indirect potable reuse through groundwater recharge, there are a number of significant unanswered questions regarding indirect potable reuse through surface water augmentation and direct potable reuse.~~

(j) This chapter is not intended to delay, invalidate, or reverse any study or project, or development of regulations by the department, the state board, or the regional boards regarding the use of recycled water for ~~indirect~~ potable reuse. ~~for groundwater recharge, surface water augmentation, or direct potable reuse~~.

(k) This chapter shall not be construed to delay, invalidate, or reverse the department's ongoing review of projects consistent with Section 116551 of the Health and Safety Code.

Section 13561 Water Code

~~(b) "Direct Potable Reuse" means the planned introduction of recycled water either directly into a public water system as defined in Section 116275 of the Health and Safety Code or into a raw water supply immediately upstream of a water treatment plant.~~

~~(c) "Indirect potable reuse for groundwater recharge" means the planned use of recycled water for replenishment of a groundwater basin or an aquifer that have been designated as a source of water supply for a public water system, as defined in Section 116,275 of the Health and Safety Code.~~

~~(d) "Surface Water Augmentation" means the planned placement of recycled water into a surface water reservoir used as a source of domestic drinking water supply.~~

Revised Section 13561 Water Code

(1) "Potable Reuse" means the planned treatment of municipal wastewater through multiple barrier treatment processes that produces a drinking water supply that has an equivalent level of public health protection as other sources of supply permitted under the Safe Drinking Water Act. Potable reuse consists of the following subcategories:

(a) "Potable reuse through groundwater augmentation" means the planned use of recycled water for replenishment of a groundwater basin or an aquifer that have been designated as a source of water supply for a public water system, as defined in Section 116,275 of the Health and Safety Code.

(b) "Potable reuse through reservoir augmentation" means the planned placement of recycled water into a raw surface water reservoir used as a source of domestic drinking water supply.

(c) "Potable reuse through raw water augmentation" means the planned placement of recycled water into a raw water conveyance system serving a public water system, upstream of a drinking water treatment plant.

(d) " Potable reuse through treated water augmentation" means the planned introduction of recycled water into the treated water distribution of system of a public water system as defined in Section 116275 of the Health and Safety Code.

New Water Code Section 13570
By June 1, 2018, the state board shall adopt a resolution establishing a framework for regulating potable reuse projects. When adopting the resolution the state board shall include:

(1) The consideration of the recommendations of the Expert Panel and Advisory Group and the state board's report to the legislature titled "Investigation on the Feasibility of Developing Uniform Water Recycling Criteria for Direct Potable Reuse (DPR)."
(2) A schedule for completing necessary research described in the state board's report to the legislature titled "Investigation on the Feasibility of Developing Uniform Water Recycling Criteria for Direct Potable Reuse (DPR)."
(3) A regulatory framework that will provide equivalent public health protection for potable reuse projects described in Section 13561 (1), (b), (c) and (d).
(4) A process and timeline for updating, if necessary, existing potable reuse regulations pursuant to Section 13561 (b).
(5) An approach for permitting potable reuse projects under section 116550 of the Health and Safety Code prior to the adoption of regulations pursuant to Section 13571(a).

New Water Code Section 13571
(a) On or before December 31, 2021 the Board shall adopt statewide uniform recycling criteria for projects described in Section 13561(c).
(b) The state board shall solicit stakeholder input for the development of these regulations from water agencies, wastewater agencies, local public health officers, environmental organizations, environmental justice organizations, public health nongovernmental organizations and the business community.
   (1) The state board may extend this deadline by 18 months if research as described in the report to the Legislature, "Investigation on the Feasibility of Developing Uniform Water Recycling Criteria for Direct Potable Reuse (DPR)" has been determined to be incomplete.
   (2) If the state board extends the deadline in (1), it must make a finding as to why the research contained in the report to the Legislature, "Investigation on the Feasibility of Developing Uniform Water Recycling Criteria for Direct Potable Reuse (DPR)" is incomplete.
   (3) No later than three months from making the finding in (1), the state board shall report to the Legislature on its progress towards meeting the requirement as described in section 13571 (a).

(Include a peer review group or expert panel to assess SWRCB finding???)

Bioenergy Association of California

Need for Legislation to Correct Definitions of Biogas, Biomethane and Organic Waste, and Adopt New Definition of Renewable Gas

Goal: To correct and make consistent the definition of terms used in AB 1900 (Gatto, 2012) and SB 1383 (Lara, 2016) to help California meet its Low Carbon Fuel, renewable power and climate change goals. SB 1383 requires the state to significantly increase the production and use of renewable gas, including biogas and biomethane, but the terms "biogas" and "biomethane" have inaccurate and contradictory definitions under state law, and the term "renewable gas" has no definition at all. Correcting the existing definitions and establishing the definition of renewable gas in statute will help to quickly expand the production and use of renewable gas, including biogas and biomethane, as required by SB 1383, AB 1900 and several other laws.

1) BIOGAS

The definition of "biogas" for pipeline injection is limited to a single technology, (anaerobic digestion) that excludes the majority of potential biogas production in California, including biogas produced from wood, forest, agricultural and other cellulosic waste. It also excludes RPS eligible biogas that is generated pursuant to SB 498 (Lara, 2014). BAC proposes to expand the definition of biogas to include the current definition plus biogas generated pursuant to SB 498.

H&S Code section 25420 defines biogas for pipeline injection as:

> (a) "Biogas" means gas that is produced from the anaerobic decomposition of organic material.

The RPS Eligibility Guidebook defines biogas as:

> digester gas, landfill gas, and any gas derived from an eligible biomass feedstock, defined by Public Resources Code section 40106, pursuant to SB 498 (Lara, 2014)

BAC's Proposed Change to H&S Code section 25420:

> "Biogas" means gas that is produced from the anaerobic decomposition of organic materials *<u>or the noncombustion thermal conversion of eligible</u>*

biomass feedstock consistent with Section 40106 of the Public Resources Code.

2) BIOMETHANE

The current definition of biomethane is inaccurate and contradicts common and technical use of the term. Biomethane is the methane produced from organic material, regardless of its end use. The definition under H&S code incorrectly limits it to biogas that meets pipeline standards, which excludes biomethane used onsite for power, transportation fuel or other purposes. Current definitions are also contradictory.

AB 1900 (H&S Code section 25420), defines biomethane as:

> (b) "Biomethane" means biogas that meets the standards adopted pursuant to subdivisions (c) and (d) of Section 25421 for injection into a common carrier pipeline.

SB 840 (2016) – Section 10 Findings and Declarations:

> (c) Biomethane is gas generated from organic waste through anaerobic digestion, gasification, pyrolysis, or other conversion technology that converts organic matter to gas. Biomethane may be produced from multiple sources, including agricultural waste, forest waste, landfill gas, wastewater treatment byproducts, and diverted organic waste.
> (f) Biomethane can also be used as transportation fuel or injected into natural gas pipelines for other uses.

BAC's Proposed Change to H&S Code section 25420:

> (b) "Biomethane" means ~~*biogas that meets the standards adopted pursuant to subdivisions (c) and (d) of Section 25421 for injection into a common carrier pipeline.*~~ *the methane derived from biogas*.

3) ORGANIC WASTE

Current definitions of organic waste exclude the byproducts of anaerobic digestion, which have additional energy value if converted through gasification or other conversion technologies.

BAC's Proposed Addition to Public Resources Code section 40106:

> 40106. (a) "Biomass conversion" means the production of heat, fuels, or electricity by the controlled combustion of, or the use of other

noncombustion thermal conversion technologies on, the following materials, when separated from other solid waste:
(1) Agricultural crop residues.
(2) Bark, lawn, yard, and garden clippings.
(3) Leaves, silvicultural residue, and tree and brush pruning.
(4) Wood, wood chips, and wood waste.
(5) Nonrecyclable pulp or nonrecyclable paper materials.
(6) The noncombustion thermal conversion of biosolids or the organic byproducts of anaerobic digestion.

4) RENEWABLE GAS

SB 1383 refers to “renewable gas” in several places, but does not define the term. “Renewable gas” is not defined anywhere else in state law.

Proposed definition to be added to H&S Code section 25420:

25420. *(c) “Renewable gas” means biogas, biomethane or any gas that is produced by an eligible renewable energy resource meeting the requirements of the California Renewables Portfolio Standard Program (Article 16 (commencing with Section 399.11) of Chapter 2.3 of Part 1 of Division 1 of the Public Utilities Code), including the renewable fraction of grid electricity, or direct solar energy.*

5) OTHER

Provision requested by the CPUC for clarification:

Nothing in this section is intended to affect standards adopted pursuant to Section 25421 before January 1, 2016, for biomethane that is to be injected into a common carrier pipeline.

State of California

LITTLE HOOVER COMMISSION

December 16, 2016

Ms. Roberta L. (Bobbi) Larson
Executive Director, California Association of Sanitation Agencies (CASA)
1225 8th Street, Suite 595
Sacramento, CA 95814

RECEIVED 12/21/16

Dear Ms. Larson,

The Little Hoover Commission has begun a review of California's state agency permitting requirements and how they impact the timeliness and viability of natural resource projects planned by government agencies and special districts at the local and regional level. The Commission is particularly interested in public projects that are increasingly necessary to protect California residents, wildlife and environments – both natural and human-altered – from the anticipated impacts of climate change. The study will examine state permitting timelines and processes, as well as requirements for endowments to fund perpetual maintenance of lands established for environmental mitigation purposes. Requirements for endowments, also used by federal agencies, are a relatively recent addition to state permitting laws.

As part of an ongoing review of special districts, the Commission received testimony at an October 2016 public hearing from some public agencies that endowment requirements and long, unpredictable timelines to receive permits due to inadequate state agency staffing are adding months or years to project schedules, as well as driving up costs. Representatives of public agencies contend that endowment requirements of several million dollars remove large one-time sums from annual budgets and limit their ability to allocate taxpayer dollars effectively. Several have tried seeking exemptions through the legislative process.

As a result of these concerns, the Commission has planned a public hearing on **Thursday, February 23, 2017, at 9:30 a.m. in the State Capitol, Room 437.**

Land trusts and other supporters of required endowments maintain that endowments, as a permitting mechanism, are essential to fund long-term mitigation land management, especially in volatile financial environments in which public agency budgets can vary dramatically year to year. There is additional concern that waiving certain requirements for public agencies could create an uneven playing field in environmental mitigation land projects. These perspectives also will be considered at the hearing. The issue has received considerable legislative attention in recent years. The Commission intends to provide recommendations that improve state permitting processes, especially given the anticipated need for flexibility and faster action on climate change adaptation projects.

Please note that this is not a request to testify at the Commission's hearing. Commission staff will contact potential witnesses directly. If you have any information you would like to share with the Commission or have any questions, please contact Carole D'Elia, executive director or Jim Wasserman, deputy executive director. They can be reached by e-mail at carole.d'elia@lhc.ca.gov and jim.wasserman@lhc.ca.gov, or by phone at 916-445-2125.

Sincerely,

Pedro Nava
Chairman

Milton Marks Commission on California State Government Organization and Economy ◆ http://www.lhc.ca.gov/
925 L Street, Suite 805 ◆ Sacramento, CA 95814 ◆ 916-445-2125 ◆ *fax* 916-322-7709 ◆ *e-mail* littlehoover@lhc.ca.gov

Climate Change

Climate change threatens California's economy, environment, and public health. The state ended 2016 having experienced a fifth year of drought, vast tree mortality, and one of the hottest years on record.

The overwhelming majority of scientists have concluded that greenhouse gas emissions cause climate change and recommend that these emissions be reduced to 80 percent below 1990 levels by 2050 to avert catastrophic environmental and economic impacts. Beginning with the passage of the California Global Warming Solutions Act of 2006 (AB 32), the state has enacted decisive measures to reduce greenhouse gas emissions. With AB 32, the state adopted a three-pronged approach to reducing greenhouse gas emissions: employing standards and regulations, emission reduction incentives through grant programs, and a market-based compliance mechanism known as Cap and Trade. The Cap and Trade Program sets a statewide limit on the greenhouse gas emissions sources responsible for 85 percent of California greenhouse gases.

In 2012, the state held its first Cap and Trade auction of emission allowances and subsequently developed a comprehensive plan to invest proceeds from the Cap and Trade auctions to reduce greenhouse gas emissions statewide, including directing at least 25 percent of spending to benefit disadvantaged communities. In 2015, the Governor introduced the most ambitious 2030 climate target in North America—a reduction of greenhouse gas emissions to 40 percent below 1990 levels—and the Legislature codified this target with the passage of Chapter 249, Statutes of 2016 (SB 32).

Achieving these ambitious and necessary environmental goals while continuing to expand the state's strong economy requires working with communities to implement cost-effective solutions to reduce greenhouse gas emissions. In December 2016, the Air Resources Board released the discussion draft of the Scoping Plan, providing a blueprint for reaching 2030 climate targets. The Plan evaluates three scenarios for meeting the 2030 target. One scenario considers sector-specific emissions reductions through traditional command and control regulations, another considers a carbon tax, and the third considers continuation of the Cap and Trade Program. Consistent with the legislative directive in Chapter 250, Statutes of 2016 (AB 197), to prioritize direct emission controls, the Plan calls for direct reductions at refineries. To complement these direct reductions, an ongoing priority for the state will be to find ways to reduce toxic air contaminants and criteria pollutants from large emitters.

The Cap and Trade Program clearly represents the most flexible and cost-effective approach to continue reducing greenhouse gases by allowing the state's private sector to determine appropriate paths to meet emissions reductions over the next 13 years.

Cap and Trade Expenditure Plan

To date, the state has appropriated approximately $3.4 billion in Cap and Trade auction proceeds for programs that reduce or sequester greenhouse gases by providing individuals, households, communities, and regions more transit options, modern housing near jobs and services, additional tree cover, forest and watershed improvements, healthy soils, recycling opportunities, and housing upgrades to cut energy use (see Figure CLI-01). Cap and Trade funding has allowed the state to leverage approximately $3.2 billion in federal funds to begin the development of the nation's first high-speed rail line. In addition, with Cap and Trade proceeds from the electric utility sector, over 10.8 million households have received climate credits on their bills twice per year since 2014 to reduce by over $2 billion the impact of changing household electric utility costs.

Over the past year, Cap and Trade auctions have experienced significant volatility. After several consecutive auctions that generated over $500 million in proceeds, the May and August auctions in 2016 generated only $10 million and $8 million, respectively. However, the most recent auction in November 2016 generated $364 million.

One of the factors that may have contributed to this revenue volatility is the perceived legal uncertainty about Cap and Trade beyond 2020. Consequently, the Administration

Figure-CLI-01

Cap and Trade Expenditures To Date

(Dollars in Millions)

Investment Category	*Department*	*Program*	*Amount*
Sustainable Communities & Clean Transportation	High Speed Rail Authority	High Speed Rail Project	$800
	State Transit Assistance	Low Carbon Transit Operations	$135
	Transportation Agency	Transit and Intercity Rail Capital Program	$380
	Strategic Growth Council	Affordable Housing and Sustainable Communities Program	$570
	Caltrans	Active Transportation	$10
	Strategic Growth Council	Transformative Climate Communities Program & Technical Assistance	$142
	Air Resources Board	Low Carbon Transportation	$688
Short Lived Climate Pollutants	Air Resources Board	Black Carbon Woodsmoke	$5
	Cal Recycle	Waste Diversion	$72
	Department of Food and Agriculture	Dairy Digesters & Alternative Fuels	$65
Carbon Sequestration	CAL FIRE	Healthy Forests	$49
		Urban Forestry	$33
	Department of Fish and Game	Wetlands Restoration	$29
	Department of Food and Agriculture	Climate Smart Agriculture - Healthy Soils	$8
	Natural Resources Agency	Urban Greening	$80
Energy Efficiency/ Renewable Energy	Department of Community Services and Development	Energy Efficiency Upgrades/ Weatherization	$174
	Department of Water Resources	Water Use Efficiency	$70
	Department of Food and Agriculture	State Water Efficiency and Enhancement Program	$68
	Total		**$3,378**

proposes legislation to confirm the Air Board's authority, through a two-thirds urgency vote, to administer Cap and Trade auctions beyond 2020.

The Budget proposes a $2.2 billion Cap and Trade Expenditure Plan to be allocated after legislation confirming the Air Board's authority to administer the Cap and Trade Program beyond 2020 is enacted through a two-thirds vote (see Figure CLI-02). The Budget builds upon the investment categories funded in the 2016 Cap and Trade agreement, such as short-lived climate pollutants, carbon sequestration, low-carbon transportation, and transformative climate communities. The Cap and Trade Expenditure Plan also includes $500 million for the Administration's proposed Transportation package. Consistent with the provisions of Chapter 36, Statutes of 2014 (SB 862), the Budget

Figure CLI-02

2017 18 Cap and Trade Expenditure Plan

(Dollars in Millions)

Investment Category	*Department*	*Program*	*Amount*
Continuous Appropriation	High Speed Rail Authority	High Speed Rail Project	$375
	State Transit Assistance	Low Carbon Transit Operations	$75
	Transportation Agency	Transit and Intercity Rail Capital Program	$150
	Strategic Growth Council	Affordable Housing and Sustainable Communities Program	$300
Transportation Package	Transportation Agency	Transit and Intercity Rail Capital Program	$500
	Caltrans	Active Transportation	
50 Percent Reduction in Petroleum Use	Air Resources Board	Low Carbon Transportation	$363
Transformational Climate Communities	Strategic Growth Council	Transformative Climate Communities	$142
		Technical Assistance & Outreach	
Short Lived Climate Pollutants	Air Resources Board	Black Carbon Woodsmoke	$95
	Cal Recycle	Waste Diversion	
	Department of Food and Agriculture	Dairy Digesters	
Carbon Sequestration	CAL FIRE	Healthy Forests	$127.5
		Urban Forestry	
	Department of Food and Agriculture	Climate Smart Agriculture - Healthy Soils	
	Natural Resources Agency	Urban Greening	
Energy Efficiency/ Renewable Energy	Department of Community Services and Development	Energy Efficiency Upgrades/ Weatherization	$27.5
	Department of Food and Agriculture	State Water Efficiency and Enhancement Program	
	Total		**$2,155**

also reflects $900 million, or 60 percent of projected auction proceeds, in continuously appropriated funds for high-speed rail, affordable housing, sustainable communities, and public transit.

Of the $1.3 billion in non-continuously appropriated funds, $863 million is proposed for transportation programs to lower emissions in the sector that represents the largest share of statewide emissions at nearly 40 percent. This funding could support a reduction in housing and transportation costs through the development of transit-oriented development that brings jobs and housing closer together, as well as provide a substantial investment in incentives for electric vehicles and the development of in-state low-carbon biofuels. An additional $392 million is proposed for programs that could expand the amount of green spaces and new and upgraded housing in the state's disadvantaged and low-income communities, reduce pollution at landfills and provide new recycling jobs, improve the condition of the state's forests, and enhance agricultural water conservation. Funding for these programs will be allocated only upon legislative confirmation of the Air Board's authority, through a two-thirds vote, to administer Cap and Trade auctions beyond 2020.

The state embraces the leadership role it has long held in strategic and bold climate policies. The formal extension of Cap and Trade will demonstrate that climate action at the sub-national level will continue.

Beverage Container Recycling Program Reform

Combatting climate change requires strategies to reduce the amount of landfilled waste and increase recycling for multiple types of materials. Recycling reduces greenhouse gas emissions by lessening the need for natural resource extraction, saving energy in the manufacturing of new products and minimizing landfill emissions.

Over the past 30 years, the Beverage Container Recycling Program, which is administered by the Department of Resources Recycling and Recovery (CalRecycle), has raised consumer awareness of the environmental impacts of littering and the benefits of recycling single-use beverage containers. However, the program faces significant challenges, prompted by changes in consumer products and behavior, developments in recycling systems, and fluctuations in the global commodities market.

To maximize the environmental and economic benefits of recycling beverage containers, the program requires comprehensive reform that aligns with the state's climate change goals, the state's 75 percent waste diversion goal, and fiscal sustainability based on the following principles:

- Improving Recycling and Remanufacturing—The program has been successful in its initial goal of reducing litter by providing recycling collection opportunities for consumers. However, collection does not ensure that a product is recycled into a new commodity. Future investments should be focused on creating clean, recyclable streams of material, which will improve the recycling and remanufacturing segments of the current system.

- Sharing Responsibility—Historically, the consumer has shouldered most of the financial burden to sustain the program. Program responsibilities and financing should be rebalanced among all program participants.
- Enhancing Adaptability and Sustainability—Increases in the recycling rate have resulted in a structural deficit in the Beverage Container Recycling Fund. In addition, the program does not respond quickly to fluctuations in the marketplace. The program must be both nimble and fiscally sustainable.

The Administration is committed to collaborating with stakeholders on a comprehensive reform package. To that end, CalRecycle proposes a policy framework that outlines key components of reform.

Natural Resources

The Natural Resources Agency consists of 26 departments, boards, commissions, and conservancies responsible for administering programs to conserve, protect, restore, and enhance the natural, historical, and cultural resources of California. The Budget includes total funding of $8.8 billion ($2.8 billion General Fund) for all programs included in this Agency.

Continued Effects of Drought

The years 2012–2015 rank as the four driest years on record in terms of state precipitation. In 2016, Northern California experienced average to slightly above-average precipitation, but conditions statewide did not improve enough to erase the effects of severe drought. Some major reservoirs and groundwater aquifers remain depleted and drinking water supplies are at risk in some communities. In addition, a tree mortality crisis afflicts an estimated 102 million trees statewide and drought conditions have degraded wildlife habitat connected to lakes, rivers, streams and wetlands.

The state's drought response is strategically guided by advancing several of the key actions in the California Water Action Plan that will provide long-term benefits for the state. In November 2014, voters overwhelmingly approved Proposition 1, which provides $7.5 billion in bonds for water storage, water supply, water quality, flood protection, and watershed protection and restoration projects.

Since the Governor first declared a state of drought emergency in January 2014, the Administration has worked with the Legislature to appropriate $3.9 billion to assist drought-impacted communities and provide additional resources for critical water infrastructure projects, wildfire suppression and wildlife emergencies.

The Budget includes an additional $178.7 million of one-time resources for 2017-18 to reflect current drought conditions and provide immediate response to drought impacts (see Figure RES-01). The Administration will continue to monitor drought conditions through the 2017 rainy season.

Figure RES-01

Emergency Drought Response
(Dollars in Millions)

Investment Category	*Department*	*Program*	*Amount*
Protecting Water Supplies and Water Conservation	Department of Water Resources	Local Assistance for Small Communities	$5.0
	Water Board	Water Rights Management	$5.3
	Department of Water Resources	Drought Management and Response	$7.0
	Department of Water Resources	Save Our Water Campaign	$2.0
Emergency Response	Department of Forestry and Fire Protection	Enhanced Fire Protection	$91.0
	Office of Emergency Services	California Disaster Assistance Act	$52.7
	Office of Emergency Services	State Operations Center	$4.0
Protecting Fish and Wildlife	Department of Fish and Wildlife	Emergency Fish Rescues and Monitoring	$8.2
	Department of Water Resources	Delta Smelt Resiliency Strategy	$3.5
Total			**$178.7**

Building on the efforts in previous years, key components of the 2017-18 Drought Package are described below.

Emergency Drinking Water

As a result of drought conditions, hundreds of homes in rural areas dependent on private domestic wells have lost water from lowering water tables and are financially unable to drill deeper wells. The state has worked with local governments to provide temporary water supplies and develop permanent solutions to water shortages. In East Porterville, for example, state funding has been used to assist up to 1,500 property owners who have failing private wells with connecting to the City of Porterville's public water system.

The Budget provides $5 million General Fund for the Department of Water Resources to provide emergency drinking water support for small communities by working to develop additional water supplies. Furthermore, the State Water Board will continue to address critical water supply impacts of drought on small communities by funding the installation or deepening of wells, and where appropriate, requiring the consolidation of small failing water systems with functioning systems that are able to provide a safe and reliable supply.

Tree Mortality and Enhanced Fire Protection

Based on aerial surveys, it is estimated over 102 million trees have died as a result of the drought and the effects of bark beetle infestation. In 2016 alone, it is estimated 62 million trees died and millions of additional trees are weakened and expected to die in the coming months and years. These dead and dying trees make forests more susceptible to destructive wildfires and pose public safety risks from falling trees for residents and infrastructure in rural, forested communities. The Department of Forestry and Fire Protection (CAL FIRE) has identified high hazard zones within counties suffering tree mortality.

In October 2015, the Governor issued an emergency declaration directing state and local entities, as well as utilities, to remove dead and dying trees that threaten power lines, roads, structures, and critical community infrastructure.

The Tree Mortality Task Force continues to evaluate the most effective ways to utilize existing resources to maximize the state and local response to the effects of tree mortality. These efforts include utilizing CAL FIRE equipment and personnel including foresters, hand crews, engine companies, and heavy equipment operators for hazardous tree removal and fuels reduction efforts.

In December 2016, CAL FIRE awarded $15.8 million in grants for a total of 107 projects across 34 counties to support local efforts to remove dead and dying trees that pose a threat to public health and safety and projects that reduce the threat of wildfires to homes.

The Budget includes $88 million General Fund and $3 million State Responsibility Area Fund for CAL FIRE for expanded fire protection in the 2017 fire season, including continuation of increased firefighter surge capacity, extended fire season, surge helicopter pilots, California Conservation Corps fire suppression crews, increased vehicle maintenance, and exclusive use of the large and very large air tankers. The Budget also reflects an additional $90 million General Fund in the current fiscal year, supported by the Emergency Fund, to initiate these enhanced fire protection efforts in the spring of 2017.

In addition, the Budget includes $52.7 million General Fund for the Office of Emergency Services to provide assistance to counties through the California Disaster Assistance Act, which can be used to aid local agencies in the removal of dead or dying trees that are a direct threat to public safety.

Delta Smelt Resiliency Strategy

Delta smelt, which function as an indicator species for the overall health of the Delta's ecosystem, are found only in the Sacramento-San Joaquin Delta, and their population is at an all-time low. In July 2016, the Administration initiated a Delta Smelt Resiliency Strategy that identified 13 actions including augmenting outflow, enhancing the food web, reducing nonnative invasive aquatic weeds and predatory fish, and restoring key habitat. The proposed actions respond to the near-term needs of smelt and promote resiliency to both drought conditions and future variations in habitat conditions.

The Budget includes $2.6 million General Fund and $900,000 Harbors and Watercraft Fund for the Department of Water Resources to continue implementation of the state's Delta Smelt Resiliency Strategy including aquatic weed control, adaptive food management and distribution, and wetlands flood and drain operations.

California Water Action Plan

Released in January 2014, the California Water Action Plan provides a blueprint for California to build more reliable and resilient water systems and restore important ecosystems. The Budget builds on investments from previous years and continues to prioritize the ten actions of the California Water Action Plan, including making conservation a way of life, increasing regional self-reliance in water supplies, expanding water storage and improving groundwater management and improving flood protection (see Figure RES-02).

Figure RES-02

Water Action Plan
Reliability, Restoration and Resilience

1	Make conservation a way of life
2	Increase regional self reliance and integrated water management
3	Achieve the co-equal goals for the Delta
4	Protect and restore important ecosystems
5	Manage and prepare for dry periods
6	Expand water storage capacity and improve groundwater management
7	Provide safe water for all communities
8	Increase flood protection
9	Increase operational and regulatory efficiency
10	Identify sustainable and integrated financing opportunities

Making Conservation a Way of Life

A key priority in the California Water Action Plan is to make conservation a way of life. Improving water conservation is essential for a more reliable water supply and to make the state more resilient to drought, particularly given future population increases and climate change. In May 2016, Governor Brown issued Executive Order B-37-16, which directs agencies to develop a permanent long-term framework to: (1) use water more wisely, (2) eliminate water waste, (3) strengthen local drought resilience, and (4) improve agricultural water use efficiency and drought planning.

California's urban water suppliers continue to demonstrate an ongoing commitment to conservation. Under the State Water Board's modified drought emergency regulation, water conservation levels have remained high for most communities that had passed the state's "stress test," certifying they had sufficient supplies to withstand three additional years of drought. However, not all suppliers are continuing the high levels of conservation. The Board is shifting its focus to long-term efficient water use and meeting regional drought preparedness goals.

In December 2016, the Department of Water Resources, Energy Commission, Public Utilities Commission, Department of Food and Agriculture, and the State Water Board issued a draft proposal to implement the Executive Order. The proposal was developed through a public process and recommends new water efficiency standards, additional drought planning requirements, technology assessments for reducing leaks, and mechanisms for compliance and enforcement.

Implementation of the Executive Order will require new legislation, regulatory processes, and data collection. The State Water Board will continue the existing conservation reporting website, including information technology solutions to improve user access and experience. The State Water Board will also initiate a rulemaking to permanently prohibit wasteful water uses.

Increasing Regional Self Reliance and Integrated Water Management

The California Water Action Plan recognizes the need for better regional coordination on local projects and emphasizes the need for regionally driven multi-benefit projects. Proposition 1 provided $510 million for integrated regional water management projects. To date, the state has appropriated over $1 billion for local projects and plans that support regional self-reliance and integrated water management.

Significant Adjustment:

- Integrated Regional Water Management Program—An increase of $248 million Proposition 1 funding for Department of Water Resources for integrated regional water management projects. This funding supports regionally driven multi-benefit projects that help meet the long-term water needs of the state, including assisting water infrastructure systems to adapt to climate change, encouraging collaboration in managing a region's water resources and setting regional priorities for water infrastructure, and improving regional water self-reliance.

Providing Safe Water for All Communities

Although much progress has been made, some disadvantaged communities rely on contaminated groundwater and lack the resources to operate and maintain their water systems to deliver safe and affordable water. The Administration is committed to working with the Legislature and stakeholders to address this issue. The Budget also continues efforts to reduce source contamination from agricultural practices.

Significant Adjustment:

- Irrigated Lands Regulatory Program—An increase of $1 million Waste Discharge Permit Fund and 5 new positions for the State Water Board, in coordination with the Department of Food and Agriculture, to address contamination of groundwater basins from agricultural practices.

Achieving Co-Equal Goals for the Delta

The Bay-Delta Water Quality Control Plan establishes water quality control measures needed to protect municipal, industrial, agricultural, and environmental uses of water in the watershed of the Sacramento-San Joaquin Delta and San Francisco Bay. This watershed is a source of drinking water for two-thirds of the state's population and millions of acres of farmland. The waterways of the Bay-Delta estuary and its tributaries also provide critical habitat for numerous threatened and endangered species and recreationally and commercially important species, as well as other public trust values. The State Water Board is currently in the process of updating the Plan, which was last updated in 2006.

The State Water Board relies on a regulatory approach to balancing competing demands for water in the Delta. As directed by the Governor, the Natural Resources Agency is leading voluntary negotiations with water districts and environmental groups. Agreements would describe additional water flows and habitat restoration and other measures in the major rivers that flow to the Delta. If sufficient, voluntary agreements could be accepted by the Water Board in lieu of regulatory action.

Expanding Water Storage Capacity and Improving Groundwater Management

The California Water Action Plan recognizes the need to increase the state's storage capacity, whether surface or groundwater. More storage is needed to address the effects of drought and climate change on water supplies for both human and ecosystem needs. Additionally, water storage is needed to help provide widespread public and environmental benefits, such as seasonal fish flows, improved water quality and cooling water for salmon. Proposition 1 provided $2.7 billion for investments in the public benefits of water storage projects.

In addition to storage, the state also needs to manage groundwater in a sustainable manner. To this end, the Governor signed a package of groundwater management bills in September 2014. For the first time, California water policy directed cities, counties, and water districts to work together to prevent long-term overpumping of groundwater basins.

The underlying principle of the Sustainable Groundwater Management Act of 2014 (SGMA) is that groundwater is best managed at the local level. SGMA places significant responsibilities upon local agencies to organize, plan, and ultimately manage their groundwater resources to a sustainable level within a 20-year time horizon, along with fee authority to help cover costs. However, the State will intervene temporarily to protect groundwater basins when local agencies are unwilling or unable to adequately do so.

Progress since enactment of SGMA includes reviewing formation notices for 139 local Groundwater Sustainability Agencies, adoption of regulations, technical assistance for local agencies and grants from the state to assist with planning.

To further this important component of the Water Action Plan, the Budget supports public investments in water storage infrastructure and additional funding for SGMA implementation.

Significant Adjustments:

- Water Investment Storage Program—An increase of $1.9 million in reimbursements, from the California Water Commission's allotment of $2.7 billion Proposition 1 water storage funding, for the Department of Fish and Wildlife to support initial outreach and technical review of the ecosystem benefits of water storage project proposals submitted to the Commission.
- Sustainable Groundwater Management Act Implementation:
    - Department of Water Resources—An increase of $15 million General Fund for 29 existing positions for statewide technical assistance and to provide detailed information on basin scale water use, water supplies, and groundwater conditions. Gathering data on a statewide level is more efficient and provides greater consistency.
    - State Water Board—An increase of $2.3 million Water Rights Fund for 5 new positions and $1.5 million in contract funds to enforce reporting requirements and protect local groundwater resources beginning July 1, 2017 in high- or medium-priority groundwater basins that fail to form local governance structures as required by SGMA.

Protecting and Restoring Important Ecosystems — Revitalizing the Salton Sea

Straddling Riverside and Imperial counties in the state's southern desert and covering 350 square miles, the Salton Sea supports millions of birds and is a key stop on the Pacific Flyway. The Sea's water level will begin to decline sharply at the end of 2017 as farm-to-city water transfers take effect. The decline of the Sea poses the potential of serious impacts to wildlife and nearby residents. The Salton Sea Management Program aims to develop 25,000 acres of wildlife habitat, suppress dust, and pursue other projects over the next decade. Strengthened by a Memorandum of Understanding with the U.S. Department of the Interior, and initially funded with over $80 million from Proposition 1 in 2016-17, the program is guided by a 10-year plan that aims to preserve and enhance the ecology, economy and public health of the Sea and surrounding Colorado River region. Initial projects in the plan have begun construction, and the state will coordinate with stakeholders to further implement the plan in 2017-18.

Department of Fish and Wildlife

The Department of Fish and Wildlife manages California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological value and for their use and enjoyment by the public. This includes the management of recreational, commercial, scientific, and educational programs. The Budget includes $522.7 million ($89.3 million General Fund) and 2,375 positions for the Department.

The Department's fundamental mission includes activities such as habitat protection, law enforcement, promotion of hunting and fishing opportunities, and management of wildlife areas and ecological reserves which are supported by the Fish and Game Preservation Fund. The fund generates revenues of approximately $100 million annually, primarily from fishing and hunting licenses. While revenues have remained relatively stable in recent years, costs to deliver these programs have increased considerably, due largely to employee compensation and operational needs.

In 2012, the Natural Resources Agency completed a statutorily required California Strategic Vision process for the Department of Fish and Wildlife, which culminated with the release of the report, "Recommendations for Enhancing the State's Fish and Wildlife Management Agencies." That process and report identified the importance of long-term sustainable funding in a state that has more biodiversity than any other. The Department has completed many of the report's identified recommendations; however, the need for sustainable funding remains.

Expenditures from the fund currently exceed annual revenues by more than $20 million. Pursuant to the requirements in the 2016 Budget Act, the Department met with stakeholders for input on potential solutions, and will continue this process in 2017. The Budget proposes a significant first step to address the structural imbalance of the non-dedicated Fish and Game Preservation Fund by bringing the fund into balance for the upcoming fiscal year and reducing the annual shortfall by more than half.

Significant Adjustment:

- Fish and Game Preservation Fund—An increase of $12.4 million in additional revenue from commercial fish landing fees to fully support the Department's commercial fishing program, and a one-time redirection of $10.6 million from the Lifetime License Account. Currently, revenue from the commercial fish landing fees support less than one quarter of the Department's program costs. Further, these fees have not been adjusted in at least 20 years. This proposal sustains the current level of service, acknowledging the need to implement more permanent measures in 2018-19.

Department of Parks and Recreation

The Department of Parks and Recreation protects and preserves the state's valued natural, cultural, and historical resources while providing recreational opportunities including hiking, camping, mountain biking, horseback riding, boating and off-highway vehicle activities. The Department achieves its mission through grant programs and a network of 280 parks, which includes beaches, trails, wildlife areas, open spaces, off-highway vehicle areas, and historic sites. The Budget includes $675.6 million ($138.8 million General Fund) and 3,555 positions for the Department.

In recent years, there has been a concerted effort to strengthen the Department. In February 2015, the Parks Forward Commission, a multidisciplinary advisory council created to independently assess the state parks system and make recommendations for potential improvements, recommended improvements to address financial, cultural, and operational challenges. By that time, the Administration had established the Transformation Team to develop specific initiatives. The Transformation Team and the Department have implemented many of the reforms suggested by the Parks Forward Commission and the Legislature. In February 2017, the Transformation Team will complete its two-year term and release a final progress report. Although the work of the Transformation Team is ending, the Department is committed to continuing these important reforms and further innovation. Highlights include:

- Continue Fiscal Improvements—With philanthropic funds, the Department secured the assistance of a consulting group to help develop a new innovative budget tool, Service Based Budgeting, to be launched in spring 2017. This will improve priority setting and communicate the relationship between fiscal resources and service levels in a clear and simple manner, informing both internal and external departmental budget discussions.

- Create New Path to Park Leadership—Previously, only individuals from state parks law enforcement could serve as the Department's top leaders. The Department worked with the State Personnel Board and the Department of Human Resources to allow individuals from broad professional backgrounds to serve as top leaders throughout the state park system. Today, over 25 percent of top Parks leaders are serving from within this new classification. The Department is now developing promotional paths for the various professional groups that have a new opportunity to lead.
- Modernize Fee Collection and Technology—The Department is modernizing how it takes reservations, collects data and revenue, and manages its camping reservation inventory. The new data will allow for better-informed business decisions across the Department including operations, planning, and fiscal and customer ease.
- Foster Partnerships—The Department established a new Office of Partnerships to better support partnership arrangements that enhance programs and access.
- Restructure Organization—The Department's organizational review included internal and external stakeholder discussions and meetings around the state. The reorganization aims to eliminate redundancy while preserving programs with strong ties to local stakeholder groups such as off-highway vehicles and boating.

Building on the successes accomplished to date and those still underway, the Budget includes the following significant adjustment:

- Maintain Services at State Parks—A one-time increase of $12.6 million State Parks and Recreation Fund and $4 million from the Environmental License Plate Fund to maintain existing service levels throughout the state parks system. This proposal will allow the Department to continue implementation of recommendations of the Parks Forward Commission and the Legislature, including the establishment of an outside support organization as specified by Chapter 540, Statutes of 2016 (SB 1111). The Budget sustains the current level of service at parks for the upcoming year, although a long-term structural shortfall remains.

Proposed California Legislation to Assist Municipalities in Funding MS4 Permit Compliance and Stormwater Programs Which Augment Water Supplies

1. **Proposed Legislation Would Add a One Dollar Tire Fee to Address Stormwater Pollution caused by Tires.**

Public Resources Code sections 42885 and 42889(a)-(c), taken together, disburse seventy-five cents ($0.75) per tire collected by the State Board of Equalization to the Air Pollution Control Fund and one dollar ($1.00) per tire to the Tire Recycling Management Fund administered by the California Department of Resources Recycling and Recovery (CalRecycle). Legislation would collect an additional dollar bringing the total collected to two dollars and seventy-five cents ($2.75), and the State Board of Equalization would direct it toward the State Water Resources Control Board Division of Financial Assistance to fund stormwater projects undertaken pursuant to municipal separate storm sewer systems (MS4) permits that address, in whole or in part, zinc Total Maximum Daily Loads and water pollution caused by tires. The fee to fund the Stormwater Permit Compliance Fund would only continue in existence until such time as the Legislature adopts a source control program for zinc as it did for copper through adoption of Chapter 307 of the statutes of 2010.

2. **Modify the Porter-Cologne Act to Require Financial Capability Assessment Guidance Issued by USEPA in November 2014 in the Establishment of Water Quality Objectives in MS4 Permits.**

The Water Code requires consideration of economic factors in establishing water quality objectives. Proposed legislation would add a section to the Water Code clarifying the methodology for considering economic factors. The draft legislation would include factors such as those in the United States Environmental Protection Agency's (USEPA) Financial Capability Assessment Guidance issued in November 2014. Under the proposed bill, the State Water Resources Control Board and the Regional Water Quality Control Boards would be required to incorporate financial capability assessments into their process for establishing and approving water quality objectives, water quality control plans, MS4 permits, sanitary sewer and publicly owned treatment works permits, in order to achieve a more fiscally realistic and sustainable water management strategy. The Financial Capability Assessment Framework would not alter or waive water quality standards, but offers help to disadvantaged communities in setting priorities and scheduling.

Currently, the cost per household of compliance with stormwater, drinking water, sanitary sewer and flood control requirements in certain communities, including California's disadvantaged communities, can exceed USEPA affordability guidelines, creating economic burdens. These current cumulative costs of water programs per household do not reflect future costs. Municipalities must balance investments in water quality improvements with other essential public services such as public safety. Municipalities also face the growth in regulatory programs and compliance requirements for sanitary sewer, drinking water, stormwater and flood control, which, due to constrained public resources and competing needs, requires collaboration with the Regional Water Quality Control Boards (Regional Boards) in setting priorities and compliance deadlines.

In 1997, 2012 and 2014, the USEPA issued Guidance for Financial Capability Assessment and Schedule Development (Guidance). This Guidance provides that a financial capability analysis should consider costs of stormwater, drinking water, flood control and wastewater, ongoing asset management or system rehabilitation programs, existing Clean Water Act (CWA) and Safe Drinking Water Act (SDWA)-related capital improvement programs, collection systems and treatment facilities, and other CWA and SDWA obligations require by state or other regulators.

The Financial Capability Assessment Framework would not alter or waive water quality standards, but offers help to communities in setting priorities and scheduling.

3. **Establish a state insurance fund for personal injury or property damage caused by pollutants in waters from stormwater capture and dry-weather runoff capture projects.**

New legislation would include an insurance fund to cover liability from participation in a stormwater or runoff capture program.

Due to the benefits that accrue to the state from the development of water supplies from stormwater capture, and the benefits accruing from dry-weather runoff capture, the state would create a stormwater water supply augmentation insurance fund (Stormwater Capture Indemnity Fund or “Fund”) within the State Water Resources Control Board Division of Financial Assistance.

Such Fund would obtain a pollution insurance portfolio in which eligible public entities could participate. It would cover the liability of a public agency that constructs, operates, or has on its property, a facility for the capture of stormwater or dry weather runoff (“runoff”) and thereafter participates in such capture, in the event a pollutant is found in groundwater, surface water, wetlands, an aquifer, or waters of the United States, as defined in 33 U.S.C. Section 1251, *et seq*., from such stormwater or runoff capture system, and a court or enforcement agency of competent jurisdiction adjudges it to have caused an injury to a person or property, or the water quality of an aquifer.

Covered entities would include participating public agencies, including but not limited to municipalities, park districts, school districts and community college districts. A public agency would not be eligible for indemnity under the Fund in the event the public agency or its employee is found by a court of competent jurisdiction to have intentionally caused any injury to a person or property. The indemnity fund would be secondary to any insurance separately obtained by the entity that covers the liability. The Fund would be audited annually. The terms “dry weather runoff” and “stormwater,” would be as defined in Water Code section 10561.5 (a) and (b), respectively.

4. Legislation Requiring State Architect Develop Guidelines for Water Capture Design and Development

Since schools can exempt themselves from city requirements, most school districts follow guidance of the State Architect in development. The districts are not required to assist cities by using appropriate water capture and water quality design and development (Water Capture). Water Capture includes designs to manage rainfall and urban runoff at the source. It uses design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source. It addresses storm water through landscape features located at the parcel level and water capture projects. Water Capture may be used in open space, parks, fields, rooftops, streetscapes, parking lots, sidewalks, and medians. Water Capture design and development requirements help cities comply with numeric limits. Legislation would require the State Architect develop Water Capture guidelines similar to those adopted by some cities, for both new design and reconstruction.

UNION SANITARY DISTRICT

DATE: February 13, 2017

MEMO TO: Board of Directors - Union Sanitary District

FROM: Paul R. Eldredge, General Manager/District Engineer
Sami E. Ghossain, Manager of Technical Services
Michael Dunning, Environmental Compliance Coach
Alex Paredes, Pretreatment Coordinator

SUBJECT: Agenda Item No. 10 - Meeting of February 27, 2017
Information Item: **Publication of Intematix Corporation as Significant Violator in 2016**

Background

In accordance with the requirements of 40 CFR Section 403.8(f)(2)(viii) of the General Pretreatment Regulations for New and Existing Sources, the District is required to publish the names of all dischargers to the District's wastewater treatment plant that were in Significant Noncompliance (SNC) with EPA Pretreatment Regulations and/or the District's Sewer Ordinance No. 36.03 any time during the 2016 calendar year.

The following discharger to the District's wastewater treatment plant had a significant violation during the SNC evaluation period covering January through June of 2016:

Routine compliance sampling of Intematix Corporation between April 12 and April 13, 2016 detected a Fluoride concentration of 25 mg/L, which is in excess of the allowable Federal Monthly Average Limit of 18 mg/L at the designated Categorical Pretreatment sample location. Intematix Corporation was issued Notice of Violation N16-007, which required it to determine the cause of the violation and take immediate action to prevent a reoccurrence. Intematix Corporation was also required to perform additional self-monitoring to confirm its compliance status. Intematix Corporation was issued an Administrative Penalty, which has been paid.

Attached is a copy of the publication that will appear in the East Bay Times (East Bay Newspaper Group) during the 2nd week of March.

PRE/SEG/MD/AP:av

Attachment: Public Notice - Notice of Significant Violator

Public Notice

FOR IMMEDIATE RELEASE:

UNION SANITARY DISTRICT
5072 BENSON ROAD
UNION CITY, CA 94587
CONTACT: SAMI GHOSSAIN
(510) 477-7600

NOTICE OF SIGNIFICANT VIOLATOR

Notice is hereby given that, pursuant to the requirements of 40 CFR Section 403.8 (f)(2)(viii) of the General Pretreatment Regulations for New and Existing Sources, the Union Sanitary District (USD) is required to publish the names of all dischargers to the District's wastewater treatment plant that were in Significant Non-Compliance (SNC) with EPA Pretreatment Regulations and/or the District's Sewer Ordinance No. 36.03 requirements at any time during the 2016 calendar year.

The following discharger to Union Sanitary District's treatment plant had a significant violation during 2016:

Intematix Corporation
46410 Fremont Blvd.
Fremont, CA

Routine compliance sampling of Intematix Corporation between April 12 and April 13, 2016 detected a Fluoride concentration of 25 mg/L, which is in excess of the allowable Federal Monthly Average limit of 18 mg/L at the designated Categorical Pretreatment sample location. Intematix Corporation was issued Notice of Violation N16-007, which required it to determine the cause of the violation and take immediate action to prevent a reoccurrence. In addition, it was also required to perform additional self-monitoring to confirm its compliance status. Intematix Corporation was also issued an Administrative Penalty, which has been paid.

Intematix Corporation was classified as Significant Non-Compliance (SNC) for exceeding the Fluoride Technical Review Criteria (TRC) monthly limit during the Second Evaluation Period of 2016 (January-June) in accordance with 40 CFR 403.8

(f)(2)(viii)(B), defined as those in which 33 percent or more of all of the measurements taken for the same pollutant parameter during a 6-month period equal or exceed the product of the numeric Pretreatment Standard or Requirement including instantaneous limits, as defined by 40 CFR 403.3(l) multiplied by the applicable TRC (TRC=1.4 for BOD, TSS, fats, oil and grease, and 1.2 for all other pollutants except pH.)

DATE: February 16, 2017

MEMO TO: Board of Directors - Union Sanitary District

FROM: Paul R. Eldredge, General Manager/District Engineer
Pamela Arends-King, Business Services Manager/CFO

SUBJECT: Agenda Item No. 11 - Meeting of February 27, 2017
Information Item: **CalPERS Actuarial Valuation as of June 30, 2015, Required Contributions for Fiscal Year 2018 with Estimates Through 2023**

Recommendation

Information only.

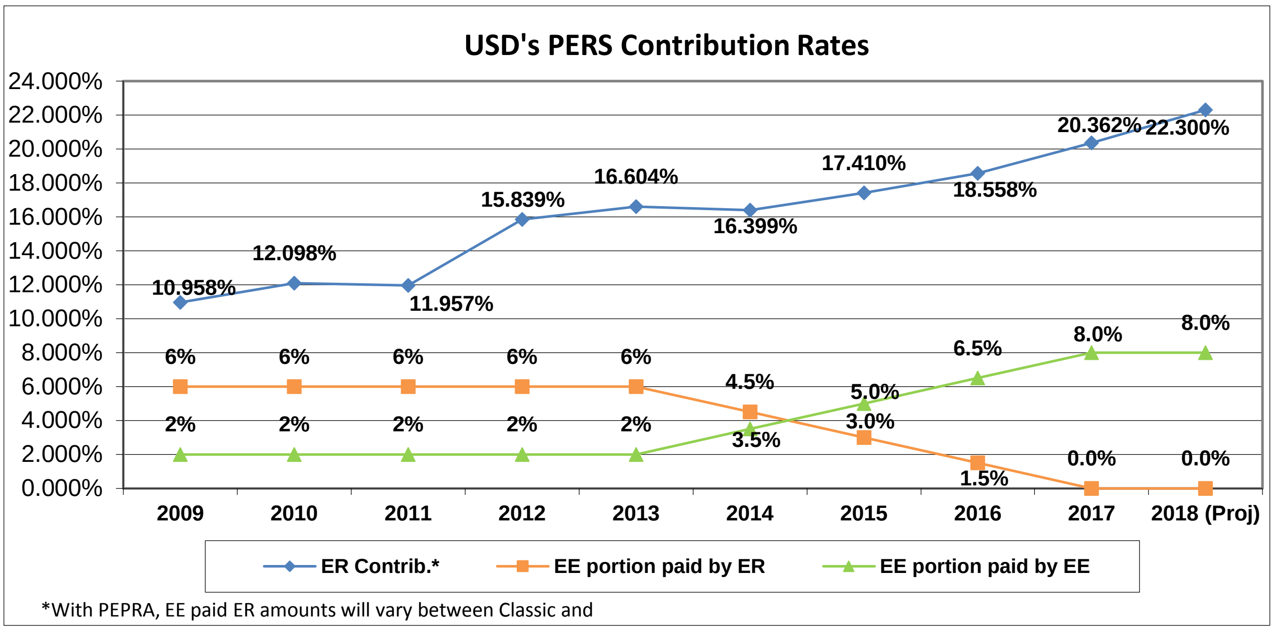
Background

The District receives an actuarial report on our pension plan annually from the California Public Employees' Retirement System (CalPERS). This year's report is significantly different from reports received in prior years as CalPERS is now providing a percentage contribution on current wages, also called Employer Normal Cost Rate, and a flat dollar contribution to be applied to Union Sanitary District's unfunded pension liability (UAL). Previously, both the normal cost and UAL were shown as a percentage of total payroll. The UAL contribution is calculated with a 30-year amortization schedule. CalPERS has separated the contributions made on current payroll (Normal Cost Rate) and the fixed UAL contributions due to lower rates of return on investments and to establish a stable method for paying down a members' UAL. The CalPERS Employer rate for FY 17 was 20.362%, which included the Normal Cost Rate of 8.608% and 11.754% rate attributed to the UAL. The 2018 projections only show a percentage for the Normal Costs, the UAL is shown as a lump sum. The following table summarizes the most recent actuarial report from CalPERS, which is attached.

Summary of CalPERS Report:

		FY17 (Current)		**FY18**
Employer Contribution Rate		20.6362%*		**8.793%**
Employee Contribution Rate		8.00%		**8.00%**
Total Normal Cost =				***16.793%***
Annual UAL Payment				**$2,139,379**
Employer Contribution		$3,079,701		**$1,392,814**
Estimated Total Employer Contribution		$3,079,701		**$3,532,193**
Employee PEPRA Rate				**6.25%**
Projected Annual Payroll for Contribution Year		$15,125,065		**$15,840,043**

* - includes the UAL for FY 17



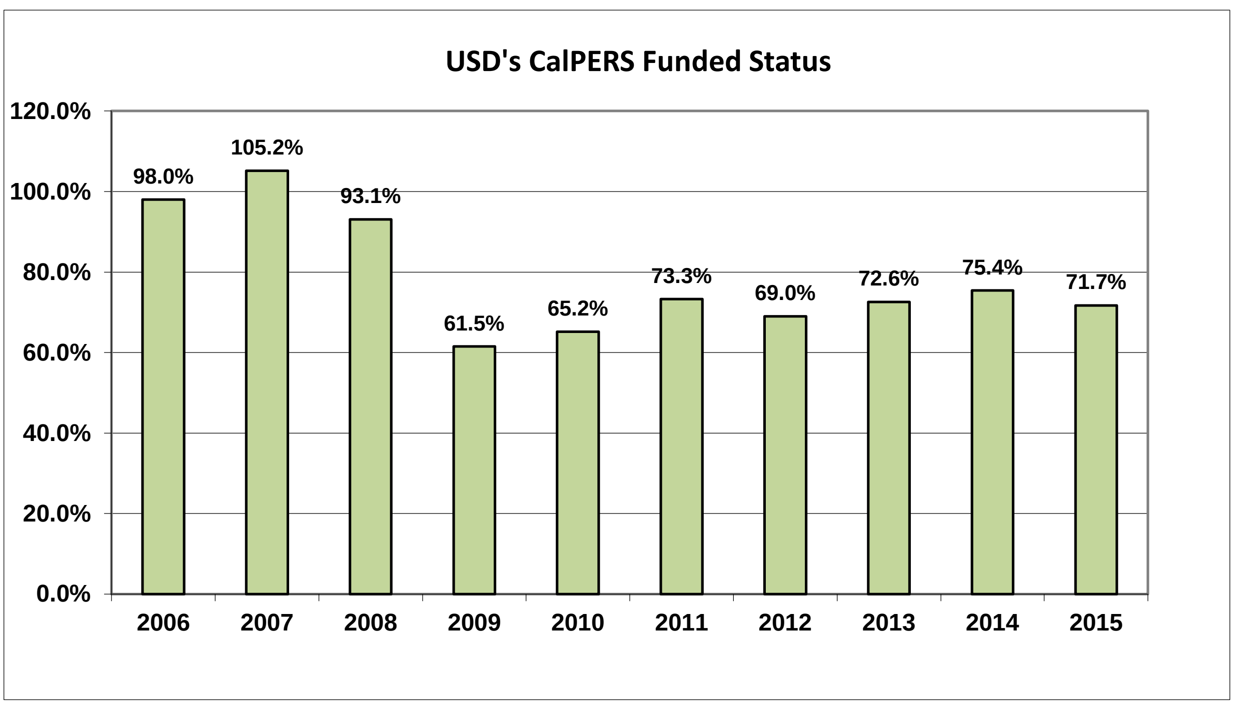
The chart above displays the District's CalPERS contribution rate from fiscal years 2009 through 2017. The estimated percentage displayed for FY 2018 is to illustrate a comparison of CalPERS rates with prior fiscal years. The FY 2018 estimated percentage combines the Normal Cost Rate with the lump sum UAL payment required for FY 2018, and converts the total to percentage of the estimated payroll of $15,840,043. Based on CalPERS assumptions the total increased contribution percentage rate between FY 2017 and 2018 is 1.938%. The lump sum UAL payment is fixed, therefore if the estimated payroll for FY 2018 is less than CalPERS assumptions, the percentage of 22.33% would increase because the total CalPERS payments (Normal Cost and fixed UAL payment) would be a greater percentage of the total payroll. Conversely, the overall District payment would be less however, as the total required contribution for the Normal Cost Rate would be calculated off a lower payroll assumption.

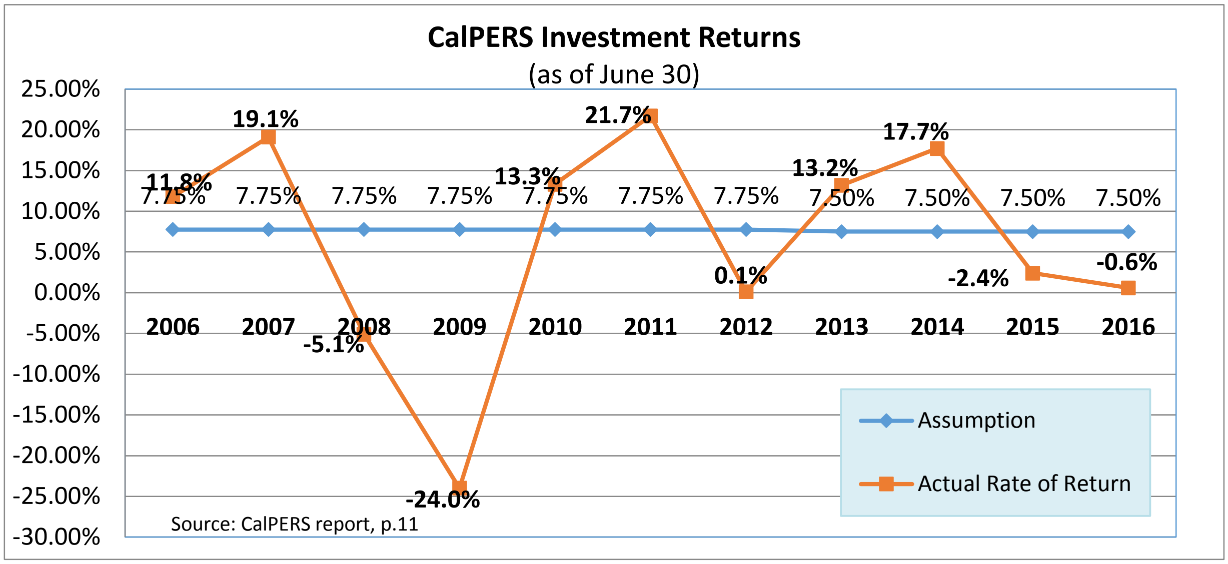
The five-year projected CalPERS Normal Cost contribution rates and UAL contributions based on the June 30, 2015 actuarial report are below. It is important to note that these projected future contributions to the UAL do not reflect the most recent revisions to the assumed rate of return (discount rate).

	Contribution	Projected Future Employer Contributions				
	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Employers Normal Cost	8.793%	8.8%	8.8%	8.8%	8.8%	8.8%
UAL Payment	$2,139,379	$2,627,684	$3,143,359	$3,468,860	$3,784,425	$4,017,890

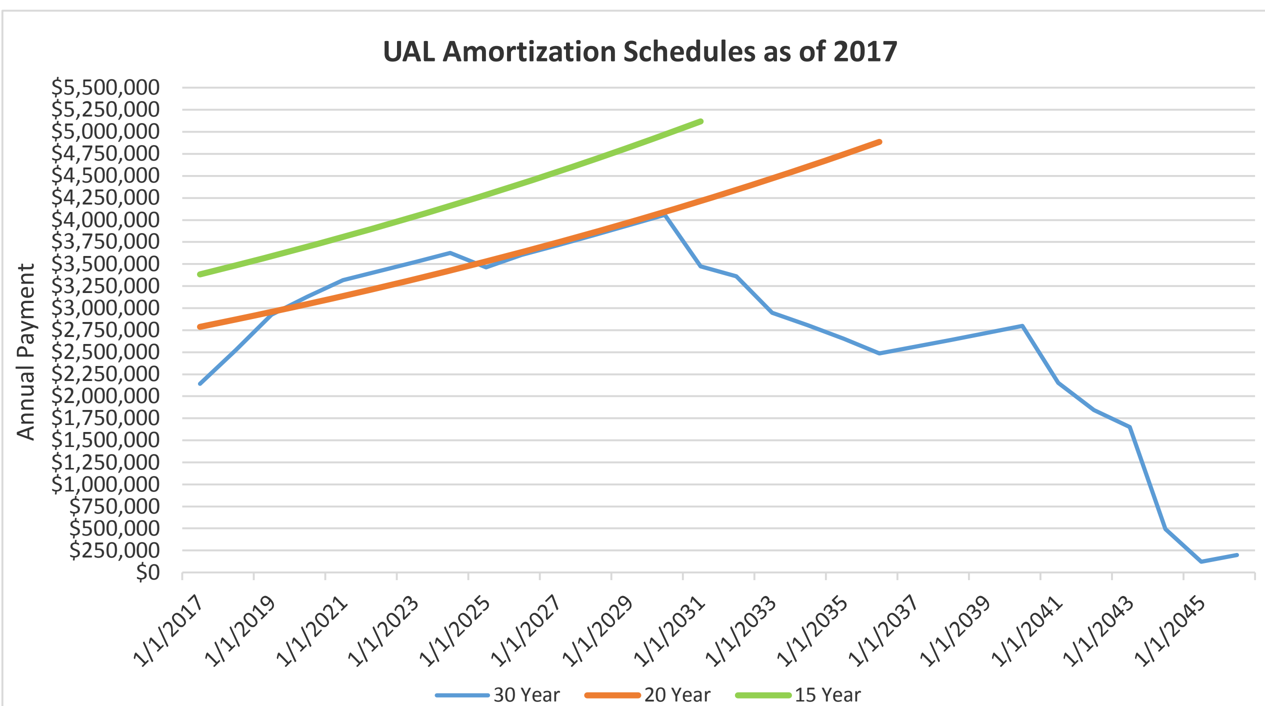
Unfunded Pension Liability

The pension plan's unfunded liability as of June 30, 2015, was $34,955,575; which is net of the accrued liability of $123,680,195 less the market value of assets totaling $88,724,680. The plan is currently 71.7% funded, a decrease of 3.7% from the funding ratio as of June 30, 2014. The overall funding status for the entire CalPERS program is approximately 68%. The following charts reflect the historical funding ratio of the District's plan from 2006 through 2015 and the CalPERS investment returns. Both charts display how the earnings on the pension plan's assets impact the funding status of the District's pension plan, and the implementation of new actuarial assumptions that reflect the greater life expectancies of its members.





Shown below are projected future year amortization schedules for annual payments to pay down the UAL over a 30 year, 20 year, and 15-year period. The schedules do not attempt to reflect any modifications to earnings or actuarial assumptions after June 30, 2015, and thus deviate somewhat from the actuarial assumed UAL payments shown in the table above and does not consider the most recent adjustments to the discount rate. The intent of this chart is to illustrate PERS assumed payoff schedule for the UAL based upon different payoff schedules and the fiscal impact. The estimated savings between the 30 year and 20-year schedule is approximately $7,236,984, and $19,190,404 between the 30 year and 15-year schedule.



Future Contributions to CalPERS

The CalPERS Board of Directors voted to lower the discount rate from 7.5% to 7.0% over the next three years. This decision was made due to lower expected investment returns and to ensure the long-term sustainability of the CalPERS fund. Attached to this staff report is the Circular Letter the District received January 19, 2017, that discusses the phase in of the 7.0% discount rate. The Discount Rate for FY 2018-19 will be 7.375%; 7.25% for FY 2019-20; and 7.0% for FY 2020-21. The lowering of the discount rate means the District will see increases in both the normal cost and the UAL.

The rate impact of the lowering of the discount rate will be applied to the June 30, 2016, valuation and the lowering of the discount rate will start FY 2018-19. District contribution rates as a result of the discount rate changes are estimated below. The normal cost portion of the employer contribution is expected to increase by the estimated payroll percentage. The increases to the UAL will be relative increases to the projected UAL payments. According to CalPERS, the District can more than likely expect to see increases somewhere in the middle of the ranges proposed.

Valuation Date	Fiscal Year Impact	Normal Cost	UAL Payments
6/30/2016	2018-19	0.25% - 0.75%	2% - 3%
6/30/2017	2019-20	0.5% - 1.5%	4% - 6%
6/30/2018	2020-21	1.0% - 3.0%	10% - 15%
6/30/2019	2021-22	1.0% - 3.0%	15% - 20%
6/30/2020	2022-23	1.0% - 3.0%	20% - 25%
6/30/2021	2023-24	1.0% - 3.0%	25% - 30%
6/30/2022	2024-25	1.0% - 3.0%	30% - 40%

There is also current discussion taking place at CalPERS about continuing to lower the discount rate over the next few years to at least 6.5%. CalPERS has provided tools for members to use to project the impact of these increases. Staff will provide the Board the projected pension plan contribution dollar amounts at the upcoming mid-year budget review workshop in March 2017. District staff have been, and will continue to explore options to manage the unfunded liabilities with the goal of having minimal impact on District rate payers. This will take some time to accomplish and will require actuarial assistance from CalPERS.

Attachments:
CalPERS Actuarial Report as of June 30, 2015
CalPERS Actuarial Circular Letter 200-004-17: Discount Rate Change

CalPERS

California Public Employees' Retirement System
Actuarial Office
P.O. Box 942701
Sacramento, CA 94229-2701
TTY: (916) 795-3240
(888) 225-7377 phone · (916) 795-2744 fax
www.calpers.ca.gov

August 2016

MISCELLANEOUS PLAN OF THE UNION SANITARY DISTRICT (CalPERS ID: 6011550262)
Annual Valuation Report as of June 30, 2015

Dear Employer,

As an attachment to this letter, you will find a copy of the June 30, 2015 actuarial valuation report of your pension plan. Your 2015 actuarial valuation report contains important actuarial information about your pension plan at CalPERS. Your CalPERS staff actuary, whose signature appears in the "Actuarial Certification" section on page 1, is available to discuss the report with you after August 31, 2016.

Future Contributions

The exhibit below displays the minimum employer contributions for Fiscal Year 2017-18 and projected contributions for Fiscal Year 2018-19, before any cost sharing. The projected contributions for Fiscal Year 2018-19 are based on the most recent information available, including an estimate of the investment return for Fiscal Year 2015-16, namely 0.0 percent. For a projection of employer contributions beyond Fiscal Year 2018-19, please refer to the "Projected Employer Contributions" in the "Highlights and Executive Summary" section. This 5-year projection of future employer contributions supersedes any previous projections we have provided. The "Risk Analysis" section of the valuation report also contains estimated employer contributions in future years under a variety of investment return scenarios.

Fiscal Year	Employer Normal Cost Rate	Employer Payment of Unfunded Liability	Employee PEPRA Rate
2017-18	8.793%	$2,139,379	6.25%
2018-19 (projected)	8.8%	$2,627,684	N/A

Member contributions other than cost sharing (whether paid by the employer or the employee) are in addition to the above. **The employer contributions in this report do not reflect any cost sharing arrangement you may have with your employees.**

The estimates for Fiscal Year 2018-19 also assume that there are no future contract amendments and no liability gains or losses (such as larger than expected pay increases, more retirements than expected, etc.). This is a very important assumption because these gains and losses do occur and can have a significant impact on required contributions. These gains and losses cannot be predicted in advance so the projected employer contributions are just estimates. The actual required employer contributions for Fiscal Year 2018-19 will be provided in next year's report.

Changes since the Prior Year's Valuation

Beginning with Fiscal Year 2017-18 CalPERS will collect employer contributions toward the plan's unfunded liability as dollar amounts instead of the prior method of a contribution rate. This change will address potential funding issues that could arise from a declining payroll or reduction in the number of active members in the plan. Funding the unfunded liability as a percentage of payroll could lead to the underfunding of the plans. Although employers will be invoiced at the beginning of the fiscal year for their unfunded liability payment the plan's normal cost contribution will continue to be collected as a percentage of payroll.

The CalPERS Board of Administration adopted a Risk Mitigation Policy which is designed to reduce funding risk over time. The policy establishes a mechanism whereby CalPERS investment performance that significantly outperforms the discount rate triggers adjustments to the discount rate, expected investment return and strategic asset allocation targets. A minimum excess investment return of 4% above the existing discount rate is necessary to cause a funding risk mitigation event. The policy has no impact on the current year valuation results but is expected to have an impact in future years. More details on the Risk Mitigation Policy can be found on our website.

Besides the above noted changes, there may also be changes specific to the plan such as contract amendments and funding changes.

Further descriptions of general changes are included in the "Highlights and Executive Summary" section and in Appendix A, "Actuarial Methods and Assumptions." The effects of the changes on the required contributions are included in the "Reconciliation of Required Employer Contributions" section.

We understand that you might have a number of questions about these results. While we are very interested in discussing these results with your agency, in the interest of allowing us to give every public agency their results, we ask that you wait until after August 31 to contact us with actuarial questions. If you have other questions, you may call the Customer Contact Center at (888)-CalPERS or (**888-225-7377**).

Sincerely,

Alan Milligan

ALAN MILLIGAN
Chief Actuary

CalPERS

ACTUARIAL VALUATION

as of June 30, 2015

for the MISCELLANEOUS PLAN of the UNION SANITARY DISTRICT

(CalPERS ID: 6011550262)
(Rate Plan ID: 984)

REQUIRED CONTRIBUTIONS FOR FISCAL YEAR July 1, 2017 – June 30, 2018

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ACTUARIAL CERTIFICATION

To the best of our knowledge, this report is complete and accurate and contains sufficient information to disclose, fully and fairly, the funded condition of the MISCELLANEOUS PLAN OF THE UNION SANITARY DISTRICT. This valuation is based on the member and financial data as of June 30, 2015 provided by the various CalPERS databases and the benefits under this plan with CalPERS as of the date this report was produced. It is our opinion that the valuation has been performed in accordance with generally accepted actuarial principles, in accordance with standards of practice prescribed by the Actuarial Standards Board, and that the assumptions and methods are internally consistent and reasonable for this plan, as prescribed by the CalPERS Board of Administration according to provisions set forth in the California Public Employees' Retirement Law.

The undersigned is an actuary for CalPERS, who is a member of the American Academy of Actuaries and the Society of Actuaries and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Fritzie Archuleta

FRITZIE ARCHULETA, ASA, MAAA
Senior Pension Actuary, CalPERS

HIGHLIGHTS AND EXECUTIVE SUMMARY

- **INTRODUCTION**
- **PURPOSE OF THE REPORT**
- **REQUIRED CONTRIBUTIONS**
- **PLAN'S FUNDED STATUS**
- **PROJECTED EMPLOYER CONTRIBUTIONS**
- **COST**
- **CHANGES SINCE THE PRIOR YEAR'S VALUATION**
- **SUBSEQUENT EVENTS**

Introduction

This report presents the results of the June 30, 2015 actuarial valuation of the MISCELLANEOUS PLAN OF THE UNION SANITARY DISTRICT of the California Public Employees' Retirement System (CalPERS). This actuarial valuation sets the required employer contributions for Fiscal Year 2017-18.

The CalPERS Board of Administration adopted a Risk Mitigation Policy which is designed to reduce funding risk over time. The policy establishes a mechanism whereby CalPERS investment performance that significantly outperforms the discount rate triggers adjustments to the discount rate, expected investment return and strategic asset allocation targets. A minimum excess investment return of 4% above the existing discount rate is necessary to cause a funding risk mitigation event. The Risk Mitigation Policy does not have an impact on the current year actuarial valuation. More details on the Risk Mitigation Policy can be found on our website.

Purpose of the Report

The actuarial valuation was prepared by the CalPERS Actuarial Office using data as of June 30, 2015. The purpose of the report is to:

- Set forth the assets and accrued liabilities of this plan as of June 30, 2015;
- Determine the required employer contributions for the fiscal year July 1, 2017 through June 30, 2018;
- Provide actuarial information as of June 30, 2015 to the CalPERS Board of Administration and other interested parties.

The pension funding information presented in this report should not be used in financial reports subject to Governmental Accounting Standards Board (GASB) Statement No. 68 for an Agent Employer Defined Benefit Pension Plan. A separate accounting valuation report for such purposes is available from CalPERS and details for ordering are available on our website.

The use of this report for any other purposes may be inappropriate. In particular, this report does not contain information applicable to alternative benefit costs. The employer should contact their actuary before disseminating any portion of this report for any reason that is not explicitly described above.

California Actuarial Advisory Panel Recommendations

This report includes all the basic disclosure elements as described in the *Model Disclosure Elements for Actuarial Valuation Reports* recommended in 2011 by the California Actuarial Advisory Panel (CAAP), with the exception of including the original base amounts of the various components of the unfunded liability in the Schedule of Amortization Bases shown on page 15.

Additionally, this report includes the following "Enhanced Risk Disclosures" also recommended by the CAAP in the Model Disclosure Elements document:

- A "Deterministic Stress Test," projecting future results under different investment income scenarios
- A "Sensitivity Analysis," showing the impact on current valuation results using a 1 percent plus or minus change in the discount rate.

Required Contributions

		Fiscal Year 2017-18
Required Employer Contribution		
Employer Normal Cost Rate		**8.793%**
Plus Either		
1) Monthly Employer Dollar UAL Payment	**$**	**178,282**
Or		
2) Annual UAL Prepayment Option	**$**	**2,063,400**
Required PEPRA Member Contribution Rate		**6.25%**

The total minimum required employer contribution is the ***sum*** *of the Plan's Employer Normal Cost Rate (expressed as a percentage of payroll)* ***plus*** *the Employer Unfunded Accrued Liability (UAL) Contribution Amount (billed monthly in dollars). Only the UAL portion of the employer contribution can be prepaid (which must be received in full no later than July 31). Plan Normal Cost contributions will be made as part of the payroll reporting process. If there is contractual cost sharing or other change, this amount will change. §20572 of the Public Employees' Retirement Law assesses interest at an annual rate of 10 percent if a contracting agency fails to remit the required contributions when due. For additional detail regarding the determination of the required contribution for PEPRA members, see Appendix D. Required member contributions for Classic members can be found in Appendix B.*

		Fiscal Year 2016-17		Fiscal Year 2017-18
Normal Cost Contribution as a Percentage of Payroll				
Total Normal Cost		16.552%		16.684%
Employee Contribution[1]		7.944%		7.891%
Employer Normal Cost		8.608%		8.793%
Projected Annual Payroll for Contribution Year	$	15,125,065	$	15,840,043
Estimated Employer Contributions Based On Projected Payroll				
Total Normal Cost	$	2,503,501	$	2,642,752
Employee Contribution[1]		1,201,535		1,249,938
Employer Normal Cost		1,301,966		1,392,814
Unfunded Liability Contribution		1,777,735		2,139,379
Estimated Total Employer Contribution[2]	$	3,079,701	$	3,532,193

[1] For classic members, this is the percentage specified in the Public Employees Retirement Law, net of any reduction from the use of a modified formula or other factors. For PEPRA members, the member contribution rate is based on 50 percent of the normal cost. A development of PEPRA member contribution rates can be found in Appendix D. Employee cost sharing is not shown in this report.

[2] As a percentage of projected payroll the UAL contribution for Fiscal Year 2017-18 is 13.506 percent for an estimated total employer contribution rate of 22.299 percent. As determined in the June 30, 2014 valuation, the Fiscal Year 2016-17 UAL contribution is 11.754 percent for a total employer contribution rate of 20.362 percent.

Plan's Funded Status

		June 30, 2014		June 30, 2015
1. Present Value of Projected Benefits	$	133,716,622	$	141,461,497
2. Entry Age Normal Accrued Liability		117,459,514		123,680,195
3. Market Value of Assets (MVA)	$	88,570,710	$	88,724,620
4. Unfunded Accrued Liability (UAL) [(2) – (3)]	$	28,888,804	$	34,955,575
5. Funded Ratio [(3) / (2)]		75.4%		71.7%

Projected Employer Contributions

The estimated employer contribution for Fiscal Year 2018-19 is based on a projection of the most recent information we have available, including an estimated 0.0 percent investment return for Fiscal Year 2015-16.

The table below shows projected employer contributions (before cost sharing) for the next five fiscal years, assuming CalPERS earns 0.0 percent for Fiscal Year 2015-16 and 7.50 percent every fiscal year thereafter, and assuming that all other actuarial assumptions will be realized and that no further changes to assumptions, contributions, benefits, or funding will occur during the projection period. The projected normal cost percentages do not reflect that the normal cost will decline over time as new employees are hired into PEPRA or other lower cost benefit tiers.

	Required Contribution	**Projected Future Employer Contributions**				
Fiscal Year	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**
Normal Cost %	8.793%	8.8%	8.8%	8.8%	8.8%	8.8%
UAL $	2,139,379	2,627,684	3,143,359	3,468,860	3,784,425	4,017,890

For projected contributions under alternate investment return scenarios, please see the "Analysis of Future Investment Return Scenarios" in the "Risk Analysis" section.

Cost

Actuarial Cost Estimates in General

What will this pension plan cost? Unfortunately, there is no simple answer. There are two major reasons for the complexity of the answer. First, actuarial calculations, including the ones in this report, are based on a number of assumptions about the future. These assumptions can be divided into two categories.

- Demographic assumptions include the percentage of employees that will terminate, die, become disabled, and retire in each future year.
- Economic assumptions include future salary increases for each active employee, and the assumption with the greatest impact: future asset returns at CalPERS for each year into the future until the last dollar is paid to current members of the plan.

While CalPERS has set these assumptions to reflect our best estimate of the real future of the plan, it must be understood that these assumptions are very long-term predictors and will surely not be realized in any one year. For example, while the asset earnings at CalPERS have averaged more than the assumed return of 7.5 percent for the past twenty year period ending June 30, 2015, returns for each fiscal year ranged from negative -24 percent to +21.7 percent.

Second, the very nature of actuarial funding produces the answer to the question of plan cost as the sum of two separate pieces.

- The Normal Cost (i.e., the annual cost associated with one year of service accrual) expressed as a percentage of total active payroll.
- The Past Service Cost or Accrued Liability (i.e., the current value of the benefit for all credited past service of current members) which is expressed as a lump sum dollar amount.

The cost is the sum of a percent of future pay and a lump sum dollar amount. In prior years CalPERS converted Past Service Cost to a percent of payroll and expressed the total required employer contribution as a single rate. Going forward the Past Service Cost will no longer be converted to a percent of payroll and this cost will be invoiced to the employer as a monthly dollar contribution amount with the option to prepay the annual amount at the beginning of the fiscal year. The normal cost will continue to be expressed as a percentage of active payroll with employer and employee contributions payable as part of the payroll reporting process.

Changes since the Prior Year's Valuation

Benefits

The standard actuarial practice at CalPERS is to recognize mandated legislative benefit changes in the first annual valuation following the effective date of the legislation. Voluntary benefit changes by plan amendment are generally included in the first valuation that is prepared after the amendment becomes effective, even if the valuation date is prior to the effective date of the amendment.

This valuation generally reflects plan changes by amendments effective before the date of the report. Please refer to the "Plan's Major Benefit Options" and Appendix B for a summary of the plan provisions used in this valuation. The effect of any mandated benefit changes or plan amendments on the unfunded liability is shown in the "(Gain)/Loss Analysis" and the effect on the employer contribution is shown in the "Reconciliation of Required Employer Contributions." It should be noted that no change in liability or contribution is shown for any plan changes which were already included in the prior year's valuation.

Actuarial Methods and Assumptions

Beginning with Fiscal Year 2017-18 CalPERS will collect employer contributions toward the plan's unfunded liability as dollar amounts instead of the prior method of a contribution rate. This change will address potential funding issues that could arise from a declining payroll or reduction in the number of active members in the plan. Funding the unfunded liability as a percentage of payroll could lead to the underfunding of the plans. Although employers will be invoiced at the beginning of the fiscal year for their unfunded liability payment the plan's normal cost contribution will continue to be collected as a percentage of payroll.

Subsequent Events

Risk Mitigation

The CalPERS Board of Administration adopted a Risk Mitigation Policy which is designed to reduce funding risk over time. The policy establishes a mechanism whereby CalPERS investment performance that significantly outperforms the discount rate triggers adjustments to the discount rate, expected investment return and strategic asset allocation targets. A minimum excess investment return of 4% above the existing discount rate is necessary to cause a funding risk mitigation event. More details on the Risk Mitigation Policy can be found on our website.

ASSETS

- **RECONCILIATION OF THE MARKET VALUE OF ASSETS**
- **ASSET ALLOCATION**
- **CALPERS HISTORY OF INVESTMENT RETURNS**

Reconciliation of the Market Value of Assets

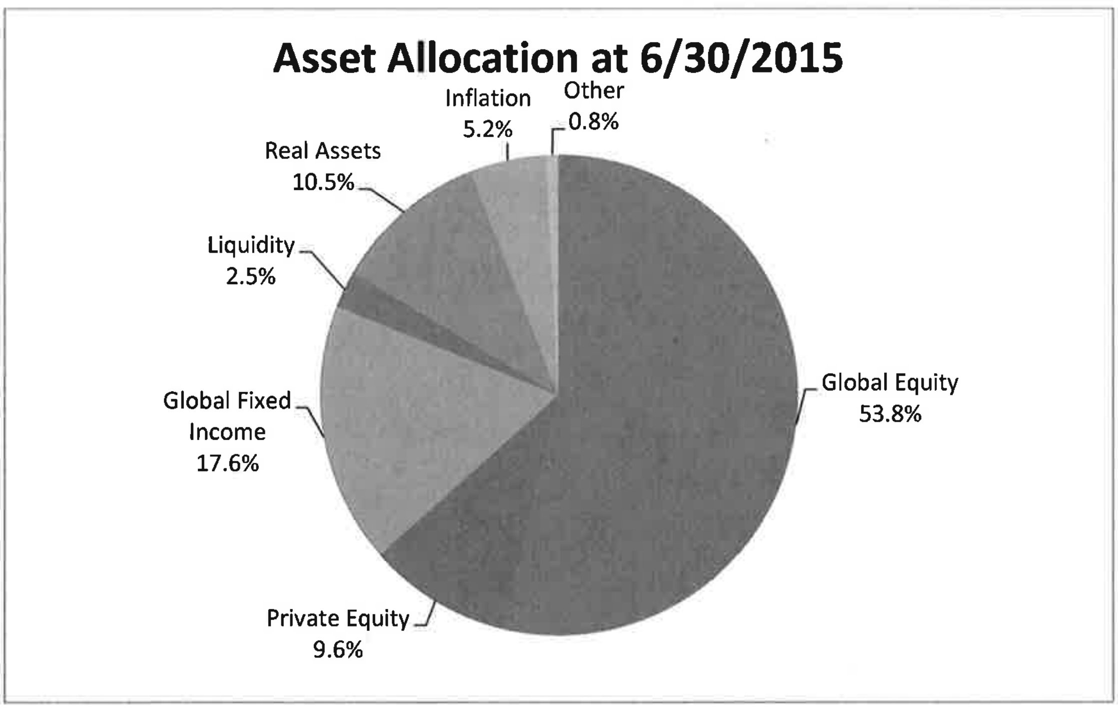
1.	Market Value of Assets as of 6/30/14 including Receivables	$	88,570,710
2.	Change in Receivables for Service Buybacks as of 6/30/14		(92,202)
3.	Employer Contributions		2,536,676
4.	Employee Contributions		1,151,263
5.	Benefit Payments to Retirees and Beneficiaries		(5,444,648)
6.	Refunds		(27,995)
7.	Lump Sum Payments		0
8.	Transfers and Miscellaneous Adjustments		120,059
9.	Investment Return		1,910,757
10.	Market Value of Assets as of 6/30/15 including Receivables	$	88,724,620

Asset Allocation

CalPERS adheres to an Asset Allocation Strategy which establishes asset class allocation policy targets and ranges, and manages those asset class allocations within their policy ranges. CalPERS Investment Belief No. 6 recognizes that strategic asset allocation is the dominant determinant of portfolio risk and return. On February 19, 2014, the CalPERS Board of Administration adopted changes to the current asset allocation as shown in the Policy Target Allocation below expressed as a percentage of total assets. The asset allocation has an expected long term blended rate of return of 7.5 percent.

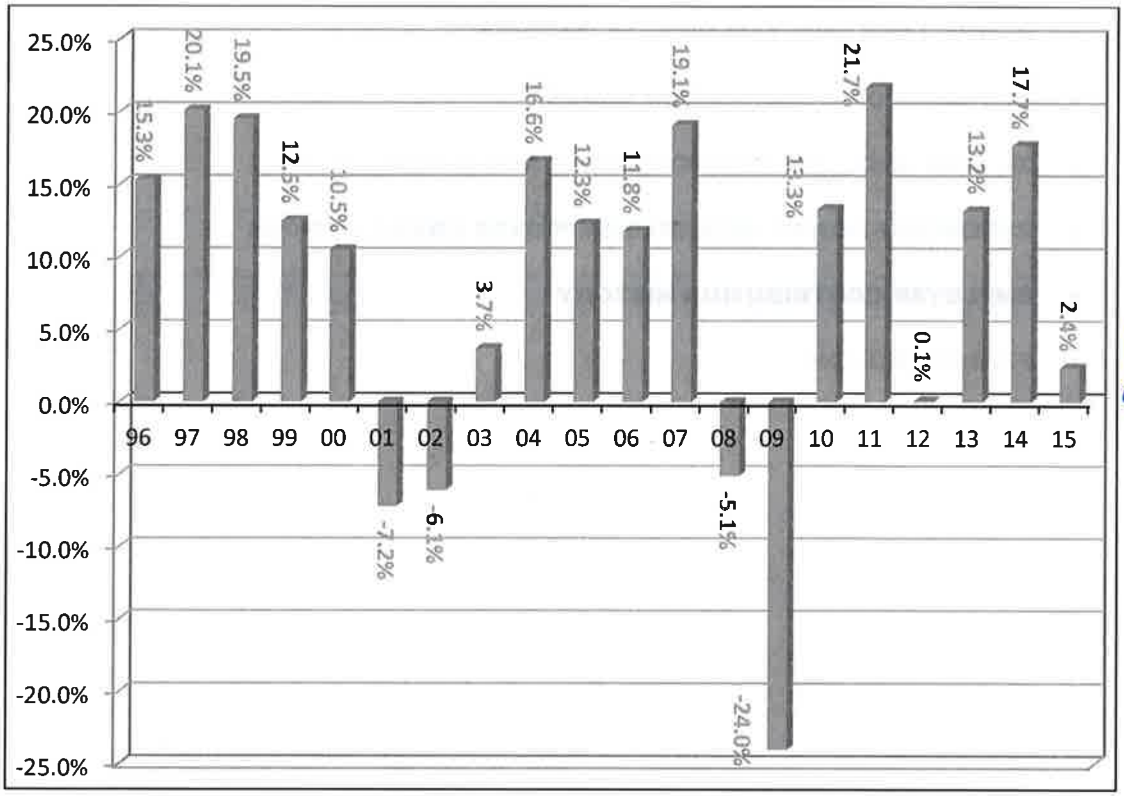
The asset allocation and market value of assets shown below reflect the values of the Public Employees' Retirement Fund (PERF) in its entirety as of June 30, 2015. The assets for UNION SANITARY DISTRICT MISCELLANEOUS PLAN are part of the PERF and are invested accordingly.

(A) Asset Class	(B) Market Value ($ Billion)	(C) Policy Target Allocation
Global Equity	162.5	51.0%
Private Equity	29.0	10.0%
Global Fixed Income	53.1	20.0%
Liquidity	7.5	1.0%
Real Assets	31.8	12.0%
Inflation Sensitive Assets	15.6	6.0%
Other	2.4	0.0%
Total Fund	**$301.9**	**100.0%**



CalPERS History of Investment Returns

The following is a chart with the 20-year historical annual returns of the Public Employees Retirement Fund for each fiscal year ending on June 30. Beginning in 2002, the figures are reported as gross of fees.



(est.) 0.6%

The table below shows historical geometric mean annual returns of the Public Employees Retirement Fund for various time periods ending on June 30, 2015, (figures are reported as gross of fees). The geometric mean rate of return is the average rate per period compounded over multiple periods. It should be recognized that in any given year the rate of return is volatile. Although the expected rate of return on the recently adopted new asset allocation is 7.5 percent, the portfolio has an expected volatility of 11.76 percent per year. The volatility is a measure of the risk of the portfolio expressed in the standard deviation of the fund's total return distribution, expressed as a percentage. Consequently, when looking at investment returns, it is more instructive to look at returns over longer time horizons.

History of CalPERS Geometric Mean Rates of Return and Volatilities

	1 year	5 year	10 year	20 year	30 year
Geometric Return	2.4%	10.7%	6.1%	7.7%	9.1%
Volatility	–	9.4%	14.0%	11.8%	10.5%

LIABILITIES AND CONTRIBUTIONS

- **DEVELOPMENT OF ACCRUED AND UNFUNDED LIABILITIES**
- **(GAIN) / LOSS ANALYSIS 06/30/14 - 06/30/15**
- **SCHEDULE OF AMORTIZATION BASES**
- **30-YEAR AMORTIZATION SCHEDULES AND ALTERNATIVES**
- **RECONCILIATION OF REQUIRED EMPLOYER CONTRIBUTIONS**
- **EMPLOYER CONTRIBUTION HISTORY**
- **FUNDING HISTORY**

Development of Accrued and Unfunded Liabilities

		June 30, 2014	June 30, 2015
1. Present Value of Projected Benefits			
a) Active Members	$	65,157,405	64,083,513
b) Transferred Members		4,458,625	4,826,356
c) Terminated Members		1,035,013	1,065,723
d) Members and Beneficiaries Receiving Payments		63,065,579	71,485,905
e) Total	$	133,716,622	141,461,497
2. Present Value of Future Employer Normal Costs	$	8,247,029	9,161,810
3. Present Value of Future Employee Contributions	$	8,010,079	8,619,492
4. Entry Age Normal Accrued Liability			
a) Active Members [(1a) - (2) - (3)]	$	48,900,297	46,302,211
b) Transferred Members (1b)		4,458,625	4,826,356
c) Terminated Members (1c)		1,035,013	1,065,723
d) Members and Beneficiaries Receiving Payments (1d)		63,065,579	71,485,905
e) Total	$	117,459,514	123,680,195
5. Market Value of Assets (MVA)	$	88,570,710	88,724,620
6. Unfunded Accrued Liability (UAL) [(4e) - (5)]	$	28,888,804	34,955,575
7. Funded Ratio [(5) / (4e)]		75.4%	71.7%

(Gain)/Loss Analysis 6/30/14 – 6/30/15

To calculate the cost requirements of the plan, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year, actual experience is compared to the expected experience based on the actuarial assumptions. This results in actuarial gains or losses, as shown below.

1. Total (Gain)/Loss for the Year		
a) Unfunded Accrued Liability (UAL) as of 6/30/14	$	28,888,804
b) Expected Payment on the UAL during 2014/2015		1,262,869
c) Interest through 6/30/15 [.075 x (1a) - ((1.075)$^{1/2}$ - 1) x (1b)]		2,120,159
d) Expected UAL before all other changes [(1a) - (1b) + (1c)]		29,746,094
e) Change due to plan changes		0
f) Change due to assumption change		0
g) Expected UAL after all other changes [(1d) + (1e) + (1f)]		29,746,094
h) Actual UAL as of 6/30/15		34,955,575
i) Total (Gain)/Loss for 2014/2015 [(1h) - (1g)]	$	5,209,481
2. Contribution (Gain)/Loss for the Year		
a) Expected Contribution (Employer and Employee)	$	3,614,675
b) Interest on Expected Contributions		133,100
c) Actual Contributions		3,687,939
d) Interest on Actual Contributions		135,798
e) Expected Contributions with Interest [(2a) + (2b)]		3,747,775
f) Actual Contributions with Interest [(2c) + (2d)]		3,823,737
g) Contribution (Gain)/Loss [(2e) - (2f)]	$	(75,962)
3. Asset (Gain)/Loss for the Year		
a) Market Value of Assets as of 6/30/14	$	88,570,710
b) Prior Fiscal Year Receivables		(583,100)
c) Current Fiscal Year Receivables		490,898
d) Contributions Received		3,687,939
e) Benefits and Refunds Paid		(5,472,643)
f) Transfers and Miscellaneous Adjustments		120,059
g) Expected Int. [.075 x (3a + 3b) + ((1.075)$^{1/2}$ - 1) x ((3d) + (3e) + (3f))]		6,537,775
h) Expected Assets as of 6/30/15 [(3a) + (3b) + (3c) + (3d) + (3e) + (3f) + (3g)]		93,351,638
i) Market Value of Assets as of 6/30/15		88,724,620
j) Asset (Gain)/Loss [(3h) - (3i)]	$	4,627,018
4. Liability (Gain)/Loss for the Year		
a) Total (Gain)/Loss (1i)	$	5,209,481
b) Contribution (Gain)/Loss (2g)		(75,962)
c) Asset (Gain)/Loss (3j)		4,627,018
d) Liability (Gain)/Loss [(4a) - (4b) - (4c)]	$	658,425

Schedule of Amortization Bases

There is a two-year lag between the valuation date and the start of the contribution fiscal year.

- The assets, liabilities, and funded status of the plan are measured as of the valuation date: June 30, 2015.
- The required employer contributions determined by the valuation are for the fiscal year beginning two years after the valuation date: Fiscal Year 2017-18.

This two-year lag is necessary due to the amount of time needed to extract and test the membership and financial data, and the need to provide public agencies with their required employer contribution well in advance of the start of the fiscal year.

The Unfunded Accrued Liability (UAL) is used to determine the employer contribution and therefore must be rolled forward two years from the valuation date to the first day of the fiscal year for which the contribution is being determined. The UAL is rolled forward each year by subtracting the expected payment on the UAL for the fiscal year and adjusting for interest. The expected payment on the UAL for a fiscal year is equal to the Expected Employer Contribution for the fiscal year minus the Expected Normal Cost for the year. The Employer Contribution for the first fiscal year is determined by the actuarial valuation two years ago and the contribution for the second year is from the actuarial valuation one year ago. The Normal Cost Rate for each of the two fiscal years is assumed to be the same as the rate determined by the current valuation. All expected dollar amounts are determined by multiplying the rate by the expected payroll for the applicable fiscal year, based on payroll as of the valuation date.

Reason for Base	Date Established	Amortization Period	Balance 6/30/15	Expected Payment 2015-16	Balance 6/30/16	Expected Payment 2016-17	Balance 6/30/17	Scheduled Payment for 2017-18
ASSUMPTION CHANGE	06/30/03	8	$1,614,632	$201,408	$1,526,905	$207,451	$1,426,334	$213,674
METHOD CHANGE	06/30/04	9	$(233,940)	$(27,059)	$(223,431)	$(27,871)	$(211,291)	$(28,707)
ASSUMPTION CHANGE	06/30/09	14	$5,023,539	$440,021	$4,944,081	$453,222	$4,844,977	$466,818
SPECIAL (GAIN)/LOSS	06/30/09	24	$2,322,909	$150,243	$2,341,351	$154,750	$2,356,504	$159,393
SPECIAL (GAIN)/LOSS	06/30/10	25	$1,399,080	$88,671	$1,412,074	$91,331	$1,423,286	$94,071
ASSUMPTION CHANGE	06/30/11	16	$2,128,288	$172,061	$2,109,513	$177,223	$2,083,978	$182,539
SPECIAL (GAIN)/LOSS	06/30/11	26	$(840,226)	$(52,245)	$(849,074)	$(53,813)	$(856,960)	$(55,427)
PAYMENT (GAIN)/LOSS	06/30/12	27	$(34,771)	$(2,124)	$(35,177)	$(2,187)	$(35,548)	$(2,253)
(GAIN)/LOSS	06/30/12	27	$5,817,151	$355,277	$5,885,078	$365,935	$5,947,049	$376,913
(GAIN)/LOSS	06/30/13	28	$13,416,038	$188,697	$14,226,596	$388,716	$14,890,561	$600,566
ASSUMPTION CHANGE	06/30/14	19	$6,547,381	$(54,773)	$7,095,225	$135,148	$7,487,243	$278,404
(GAIN)/LOSS	06/30/14	29	$(7,413,987)	$4,898	$(7,975,114)	$(112,170)	$(8,456,947)	$(231,071)
(GAIN)/LOSS	06/30/15	30	$5,209,481	$4,858	$5,595,155	$9,575	$6,004,864	$84,459
TOTAL			**$34,955,575**	**$1,469,933**	**$36,053,182**	**$1,787,310**	**$36,904,050**	**$2,139,379**

30-Year Amortization Schedule and Alternatives

The amortization schedule on the previous page shows the minimum contributions required according to CalPERS amortization policy. There has been considerable interest from many agencies in paying off these unfunded accrued liabilities sooner and the possible savings in doing so. As a result, we have provided alternate amortization schedules to help analyze the current amortization schedule and illustrate the advantages of accelerating unfunded liability payments.

Shown on the following page are future year amortization payments based on 1) the current amortization schedule reflecting the individual bases and remaining periods shown on the previous page, and 2) alternate "fresh start" amortization schedules using two sample periods that would both result in interest savings relative to the current amortization schedule. Note that the payments under each alternate scenario increase by 3 percent for each year into the future. The schedules do not attempt to reflect any experience after June 30, 2015 that may deviate from the actuarial assumptions. Therefore, future amortization payments displayed in the Current Amortization Schedule may not match projected amortization payments shown in connection with Projected Employer Contributions provided elsewhere in this report.

The Current Amortization Schedule typically contains individual bases that are both positive and negative. Positive bases result from plan changes, assumption changes or plan experience that result in increases to unfunded liability. Negative bases result from plan changes, assumption changes or plan experience that result in decreases to unfunded liability. The combination of positive and negative bases within an amortization schedule can result in unusual or problematic circumstances in future years such as:

- A positive total unfunded liability with a negative total payment,
- A negative total unfunded liability with a positive total payment, or
- Total payments that completely amortize the unfunded liability over a very short period of time

In any year where one of the above scenarios occurs, the actuary will consider corrective action such as replacing the existing unfunded liability bases with a single "fresh start" base and amortizing it over a reasonable period.

The Current Amortization Schedule on the following page may appear to show that, based on the current amortization bases, one of the above scenarios will occur at some point in the future. It is impossible to know today whether such a scenario will in fact arise since there will be additional bases added to the amortization schedule in each future year. Should such a scenario arise in any future year, the actuary will take appropriate action based on guidelines in the CalPERS amortization policy. For purposes of this display, total payments include any negative payments. Therefore, the amount of estimated savings may be understated to the extent that negative payments appear in the current schedule.

30-Year Amortization Schedule and Alternatives

	Current Amortization Schedule		Alternate Schedules: 20 Year Amortization		15 Year Amortization	
Date	**Balance**	**Payment**	**Balance**	**Payment**	**Balance**	**Payment**
6/30/2017	36,904,050	2,139,379	36,904,050	2,786,456	36,904,050	3,382,977
6/30/2018	37,453,696	2,521,125	36,782,795	2,870,050	36,164,308	3,484,466
6/30/2019	37,648,766	2,923,848	36,565,773	2,956,151	35,263,860	3,589,000
6/30/2020	37,440,911	3,129,716	36,243,203	3,044,836	34,187,495	3,696,670
6/30/2021	37,004,020	3,318,667	35,804,491	3,136,181	32,918,767	3,807,571
6/30/2022	36,338,455	3,418,226	35,238,166	3,230,266	31,439,901	3,921,798
6/30/2023	35,519,744	3,520,774	34,531,817	3,327,174	29,731,688	4,039,452
6/30/2024	34,533,310	3,626,396	33,672,016	3,426,990	27,773,372	4,160,635
6/30/2025	33,363,382	3,464,512	32,644,238	3,529,799	25,542,536	4,285,454
6/30/2026	32,273,551	3,605,905	31,432,783	3,635,693	23,014,973	4,414,018
6/30/2027	30,955,386	3,714,083	30,020,674	3,744,764	20,164,545	4,546,438
6/30/2028	29,426,198	3,825,503	28,389,571	3,857,107	16,963,038	4,682,832
6/30/2029	27,666,797	3,940,268	26,519,655	3,972,820	13,380,003	4,823,316
6/30/2030	25,656,450	4,058,476	24,389,522	4,092,005	9,382,582	4,968,016
6/30/2031	23,372,764	3,474,125	21,976,055	4,214,765	4,935,327	5,117,056
6/30/2032	21,523,674	3,361,477	19,254,298	4,341,208		
6/30/2033	19,652,692	2,946,021	16,197,310	4,471,444		
6/30/2034	18,072,145	2,804,321	12,776,017	4,605,587		
6/30/2035	16,519,971	2,651,470	8,959,044	4,743,755		
6/30/2036	15,009,866	2,486,922	4,712,542	4,886,068		
6/30/2037	13,557,110	2,561,529				
6/30/2038	11,918,043	2,638,377				
6/30/2039	10,076,369	2,717,526				
6/30/2040	8,014,505	2,799,055				
6/30/2041	5,713,473	2,152,070				
6/30/2042	3,910,669	1,842,422				
6/30/2043	2,293,706	1,652,522				
6/30/2044	752,362	494,223				
6/30/2045	296,367	122,133				
6/30/2046	191,964	199,032				
Totals		**82,110,103**		**74,873,119**		**62,919,699**
Estimated Savings				**7,236,984**		**19,190,404**

Reconciliation of Required Employer Contributions

Normal Cost (% of Payroll)

1. For Period 7/1/16 – 6/30/17	
a) Employer Normal Cost	8.608%
b) Employee Contribution	7.944%
c) Total Normal Cost	16.552%
2. Effect of changes since the prior year annual valuation	
a) Effect of changes in demographics results	0.132%
b) Effect of plan changes	0.000%
c) Effect of changes in assumptions	0.000%
d) Net effect of the changes above [sum of (a) through (c)]	0.132%
3. For Period 7/1/17 – 6/30/18	
a) Employer Normal Cost	8.793%
b) Employee Contribution	7.891%
c) Total Normal Cost	16.684%
Employer Normal Cost Change [(3a) – (1a)]	0.185%
Employee Contribution Change [(3b) – (1b)]	(0.053%)

Unfunded Liability Contribution ($)

1. For Period 7/1/16 – 6/30/17	1,777,735
2. Effect of changes since the prior year annual valuation	
a) Effect of changes in demographics and financial results	84,459
b) Effect of plan changes	0
c) Effect of changes in assumptions	0
d) Effect of progression of amortization payments	277,185
e) Effect of changes due to Fresh Start	0
f) Effect of elimination of amortization base	0
g) Net effect of the changes above [sum of (a) through (f)]	361,644
3. For Period 7/1/17 – 6/30/18 [(1)+(2g)]	2,139,379

The amounts shown for the period 7/1/16 – 6/30/17 may be different if a prepayment of unfunded actuarial liability is made or a plan change became effective after the prior year's actuarial valuation was performed.

Employer Contribution History

The table below provides a recent history of the required employer contributions for the plan, as determined by the annual actuarial valuation. It does not account for prepayments or benefit changes made during a fiscal year.

	Required By Valuation		
Fiscal Year	Employer Normal Cost	Unfunded Rate	Unfunded Liability Payment ($)
2012 - 13	8.467%	8.137%	N/A
2013 - 14	8.367%	8.032%	N/A
2014 - 15	8.389%	9.021%	N/A
2015 - 16	8.361%	10.197%	N/A
2016 - 17	8.608%	11.754%	N/A
2017 - 18	8.793%	N/A	2,139,379

Funding History

The table below shows the recent history of the actuarial accrued liability, the market value of assets, the funded ratio and the annual covered payroll.

Valuation Date	Accrued Liability	Market Value of Assets (MVA)	Unfunded Liability	Funded Ratio	Annual Covered Payroll
06/30/10	$ 88,741,572	$ 57,880,869	$ 30,860,703	65.2%	$ 12,301,216
06/30/11	94,015,409	68,869,888	25,145,521	73.3%	12,767,707
06/30/12	98,458,686	67,951,375	30,507,311	69.0%	13,063,048
06/30/13	104,969,799	76,215,351	28,754,448	72.6%	13,595,469
06/30/14	117,459,514	88,570,710	28,888,804	75.4%	13,841,577
06/30/15	123,680,195	88,724,620	34,955,575	71.7%	14,495,883

RISK ANALYSIS

- **ANALYSIS OF FUTURE INVESTMENT RETURN SCENARIOS**
- **ANALYSIS OF DISCOUNT RATE SENSITIVITY**
- **VOLATILITY RATIOS**
- **HYPOTHETICAL TERMINATION LIABILITY**

Analysis of Future Investment Return Scenarios

The investment return for Fiscal Year 2015-16 was not known at the time this report was produced. The investment return in Fiscal Year 2015-16 as of April 30, 2016 is 0.0 percent before administrative expenses. For purposes of projecting future employer contributions, we are assuming a 0.0 percent investment return for Fiscal Year 2015-16.

The investment return realized during a fiscal year first affects the required contribution for the fiscal year two years later. For example, the investment return for Fiscal Year 2015-16 will first be reflected in the June 30, 2016 actuarial valuation that will be used to set the employer contribution for Fiscal Year 2018-19. The Fiscal Year 2016-17 investment return will first be reflected in the June 30, 2017 actuarial valuation that will be used to set the employer contribution for Fiscal Year 2019-20 and so forth.

As part of this report, a sensitivity analysis was performed to determine the effects of various investment returns during fiscal years 2016-17, 2017-18 and 2018-19 on the 2019-20, 2020-21 and 2021-22 employer contributions. Once again, the projections assume that all other actuarial assumptions will be realized and that no further changes to assumptions, contributions, benefits, or funding will occur.

Five different investment return scenarios were selected.

- The first scenario is a -3.8 percent return for each of the 2016-17, 2017-18, and 2018-19 fiscal years. Based on the current investment allocation, this is what one would expect if the markets were to give us about a 5th percentile return from July 1, 2016 through June 30, 2019.
- The second scenario is a 2.8 percent return for each of the 2016-17, 2017-18, and 2018-19 fiscal years. Based on the current investment allocation, this is what one would expect if the markets were to give us about a 25th percentile return from July 1, 2016 through June 30, 2019.
- The third scenario is a 7.5 percent return for each of the 2016-17, 2017-18, and 2018-19 fiscal years. Based on the current investment allocation, this is what one would expect if the markets were to give us about a 49th percentile return from July 1, 2016 through June 30, 2019.
- The fourth scenario is a 12.0 percent return for each of the 2016-17, 2017-18, and 2018-19 fiscal years. Based on the current investment allocation, this is what one would expect if the markets were to give us about a 75th percentile return from July 1, 2016 through June 30, 2019.
- Finally, the last scenario is an 18.9 percent return for each of the 2016-17, 2017-18, and 2018-19 fiscal years. Based on the current investment allocation, this is what one would expect if the markets were to give us about a 95th percentile return from July 1, 2016 through June 30, 2019.

The table below shows the estimated projected contributions and the estimated increases for the plan under the five different scenarios.

2016-19 Investment Return Scenario	Fiscal Year			Estimated Change Between 2018-19 and 2021-22
	2019-20	2020-21	2021-22	
(3.8%)				
Normal Cost	8.8%	8.8%	8.8%	0.0%
UAL Contribution	$3,301,038	$3,942,989	$4,735,732	$2,108,048
2.8%				
Normal Cost	8.8%	8.8%	8.8%	0.0%
UAL Contribution	$3,208,951	$3,670,417	$4,197,612	$1,569,928
7.5%				
Normal Cost	8.8%	8.8%	8.8%	0.0%
UAL Contribution	$3,143,359	$3,468,860	$3,784,425	$1,156,741
12.0%				
Normal Cost	9.0%	9.2%	9.4%	0.6%
UAL Contribution	$3,079,316	$3,280,171	$3,399,559	$771,875
18.9%				
Normal Cost	9.4%	10.0%	10.6%	1.8%
UAL Contribution	$2,982,058	$2,994,235	$2,809,160	$181,476

For the last two scenarios in the table above the results incorporate the impact of CalPERS Risk Mitigation Policy. A 12.0% return would result in a reduction of the discount rate by 0.05% and a return of 18.9% would reduce the discount rate by 0.15%. Reducing the discount rate increases both the plan's accrued liability and normal cost. While the projections reflect estimated changes to the normal cost due to lower discount rates, they do not reflect the possible increase in the PEPRA member contribution rate in such scenarios. More details about the Risk Mitigation policy can be found on our website.

The projected normal cost percentages do not reflect that the normal cost will decline over time as new employees are hired into PEPRA or other lower cost benefit tiers.

Analysis of Discount Rate Sensitivity

The following analysis looks at the Fiscal Year 2017-18 total normal cost rates and liabilities under two different discount rate scenarios. Shown below are the total normal cost rates assuming discount rates that are 1 percent lower and 1 percent higher than the current valuation discount rate. This analysis shows the potential plan impacts if the PERF were to realize investment returns of 6.50 percent or 8.50 percent over the long-term.

This type of analysis gives the reader a sense of the long-term risk to required contributions.

Sensitivity Analysis			
As of June 30, 2015	**6.50% Discount Rate (-1%)**	**7.50% Discount Rate (assumed rate)**	**8.50% Discount Rate (+1%)**
Plan's Total Normal Cost	20.727%	16.684%	13.596%
Accrued Liability	$139,411,699	$123,680,195	$110,557,999
Unfunded Accrued Liability	$50,687,079	$34,955,575	$21,833,379

Volatility Ratios

The actuarial calculations supplied in this communication are based on a number of assumptions about long-term demographic and economic behavior. Unless these assumptions (terminations, deaths, disabilities, retirements, salary growth, and investment return) are exactly realized each year, there will be differences on a year-to-year basis. The year-to-year differences between actual experience and the assumptions are called actuarial gains and losses and serve to lower or raise required employer contributions from one year to the next. Therefore, employer contributions will inevitably fluctuate, especially due to the ups and downs of investment returns.

Asset Volatility Ratio (AVR)

Plans that have higher asset-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to investment return. For example, a plan with an asset-to-payroll ratio of 8 may experience twice the contribution volatility due to investment return volatility than a plan with an asset-to-payroll ratio of 4. Shown below is the asset volatility ratio, a measure of the plan's current volatility. It should be noted that this ratio is a measure of the current situation. It increases over time but generally tends to stabilize as the plan matures.

Liability Volatility Ratio (LVR)

Plans that have higher liability-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to investment return and changes in liability. For example, a plan with a liability-to-payroll ratio of 8 is expected to have twice the contribution volatility of a plan with a liability-to-payroll ratio of 4. The liability volatility ratio is also included in the table below. It should be noted that this ratio indicates a longer-term potential for contribution volatility. The asset volatility ratio, described above, will tend to move closer to the liability volatility ratio as the plan matures.

Contribution Volatility		**As of June 30, 2015**
1. Market Value of Assets without Receivables	$	88,233,722
2. Payroll		14,495,883
3. Asset Volatility Ratio (AVR) [(1) / (2)]		6.1
4. Accrued Liability	$	123,680,195
5. Liability Volatility Ratio (LVR) [(4) / (2)]		8.5

Hypothetical Termination Liability

The hypothetical termination liability is an estimate of the financial position of the plan had the contract with CalPERS been terminated as of June 30, 2015. The plan liability on a termination basis is calculated differently compared to the plan's ongoing funding liability. For this hypothetical termination liability calculation, both compensation and service are frozen as of the valuation date and no future pay increases or service accruals are assumed.

A more conservative investment policy and asset allocation strategy was adopted by the CalPERS Board for the Terminated Agency Pool. The Terminated Agency Pool has limited funding sources since no future employer contributions will be made. Therefore, expected benefit payments are secured by risk-free assets and benefit security for members is increased while limiting the funding risk. However, this asset allocation has a lower expected rate of return than the PERF and consequently, a lower discount rate assumption. The lower discount rate for the Terminated Agency Pool results in higher liabilities for terminated plans.

The effective termination discount rate will depend on actual market rates of return for risk-free securities on the date of termination. As market discount rates are variable the table below shows a range for the hypothetical termination liability based on the lowest and highest interest rates observed during an approximate 2-year period centered around the valuation date.

Market Value of Assets (MVA)	Hypothetical Termination Liability[1,2] @ 2.00%	Funded Status	Unfunded Termination Liability @ 2.00%	Hypothetical Termination Liability[1,2] @ 3.25%	Funded Status	Unfunded Termination Liability @ 3.25%
$88,724,620	$241,907,860	36.7%	$153,183,240	$203,906,272	43.5%	$115,181,652

[1] The hypothetical liabilities calculated above include a 7 percent mortality contingency load in accordance with Board policy. Other actuarial assumptions, such as wage and inflation assumptions, can be found in Appendix A.

[2] The current discount rate assumption used for termination valuations is a weighted average of the 10-year and 30-year U.S. Treasury yields where the weights are based on matching asset and liability durations as of the termination date. The discount rates used in the table are based on 20-year Treasury bonds, rounded to the nearest quarter percentage point, which is a good proxy for most plans. The 20-year Treasury yield was 2.75 percent on June 30, 2015.

In order to terminate the plan, you must first contact our Retirement Services Contract Unit to initiate a Resolution of Intent to Terminate. The completed Resolution will allow the plan actuary to give you a preliminary termination valuation with a more up-to-date estimate of the plan liabilities. CalPERS advises you to consult with the plan actuary before beginning this process.

PLAN'S MAJOR BENEFIT PROVISIONS

Plan's Major Benefit Options

Shown below is a summary of the major optional benefits for which your agency has contracted. A description of principal standard and optional plan provisions is in the following section of this Appendix.

	Contract Package					
Benefit Provision	Active Misc	Active Misc	Inactive Misc	Inactive Misc	Receiving Misc	
Benefit Formula	2.5% @ 55	2.0% @ 62	2.0% @ 55	2.0% @ 55		
Social Security Coverage	No	No	No	Yes		
Full/Modified	Full	Full	Full	Modified		
Employee Contribution Rate	8.00%	6.25%				
Final Average Compensation Period	One Year	Three Year	One Year	One Year		
Sick Leave Credit	Yes	Yes	Yes	Yes		
Non-Industrial Disability	Standard	Standard	Standard	Standard		
Industrial Disability	No	No	No	No		
Pre-Retirement Death Benefits						
Optional Settlement 2W	No	No	No	No		
1959 Survivor Benefit Level	Level 4	Level 4	Level 4	No		
Special	No	No	No	No		
Alternate (firefighters)	No	No	No	No		
Post-Retirement Death Benefits						
Lump Sum	$500	$500	$500	$500	$500	
Survivor Allowance (PRSA)	No	No	No	No	No	
COLA	2%	2%	2%	2%	2%	

APPENDICES

- APPENDIX A – ACTUARIAL METHODS AND ASSUMPTIONS
- APPENDIX B – PRINCIPAL PLAN PROVISIONS
- APPENDIX C – PARTICIPANT DATA
- APPENDIX D – DEVELOPMENT OF PEPRA MEMBER CONTRIBUTION RATES
- APPENDIX E – GLOSSARY OF ACTUARIAL TERMS

APPENDIX A

ACTUARIAL METHODS AND ASSUMPTIONS

- **ACTUARIAL DATA**
- **ACTUARIAL METHODS**
- **ACTUARIAL ASSUMPTIONS**
- **MISCELLANEOUS**

Actuarial Data

As stated in the Actuarial Certification, the data which serves as the basis of this valuation has been obtained from the various CalPERS databases. We have reviewed the valuation data and believe that it is reasonable and appropriate in aggregate. We are unaware of any potential data issues that would have a material effect on the results of this valuation, except that data does not always contain the latest salary information for former members now in reciprocal systems and does not recognize the potential for unusually large salary deviation in certain cases such as elected officials. Therefore, salary information in these cases may not be accurate. These situations are relatively infrequent, however, and when they do occur, they generally do not have a material impact on the required employer contributions.

Actuarial Methods

Actuarial Cost Method

The actuarial cost method used is the Entry Age Normal Cost Method. Under this method, projected benefits are determined for all members and the associated liabilities are spread in a manner that produces level annual cost as a percentage of pay in each year from the member's age of hire (entry age) to their assumed retirement age on the valuation date. The cost allocated to the current fiscal year is called the normal cost.

The actuarial accrued liability for active members is then calculated as the portion of the total cost of the plan allocated to prior years. The actuarial accrued liability for members currently receiving benefits and for members entitled to deferred benefits is equal to the present value of the benefits expected to be paid. No normal costs are applicable for these participants.

Amortization of Unfunded Actuarial Accrued Liability

The excess of the total actuarial accrued liability over the market value of plan assets is called the unfunded actuarial accrued liability (UAL). Funding requirements are determined by adding the normal cost and an amortization payment toward the unfunded liability. Commencing with the June 30, 2013 valuation, all new gains or losses are tracked and amortized over a fixed 30-year period with a 5 year ramp up at the beginning and a 5 year ramp down at the end of the amortization period. All changes in liability due to plan amendments (other than golden handshakes) are amortized over a 20-year period with no ramp. Changes in actuarial assumptions, or changes in actuarial methodology are amortized over a 20-year period with a 5 year ramp up at the beginning and a 5 year ramp down at the end of the amortization period. Changes in unfunded accrued liability due to a Golden Handshake will be amortized over a period of 5 years.

Exceptions for Inconsistencies:

An exception to the amortization rules above is used whenever their application results in inconsistencies. In these cases, a "fresh start" approach is used. This means that the current unfunded actuarial liability is projected and amortized over a set number of years. For example, a fresh start is needed in the following situations:

1) When a positive payment would be required on a negative unfunded actuarial liability (or conversely a negative payment on a positive unfunded actuarial liability); or
2) When there are excess assets, rather than an unfunded liability. In this situation, a 30-year fresh start is used.

It should be noted that the actuary may determine that a fresh start is necessary under other circumstances. In all cases of a fresh start, the period is set by the actuary at what is deemed appropriate; however, the period will not be greater than 30 years.

Exceptions for Inactive Plans:

The following exceptions apply to plans classified as Inactive. These plans have no active members and no expectation to have active members in the future.

- Amortization of unfunded liability is on a "level dollar" basis rather than a "level percent of pay" basis
- Actuarial judgment will be used to shorten amortization periods for Inactive plans with existing periods that are deemed too long given the duration of the liability. In many cases, a Fresh Start approach with a 20 year closed period will be used. However, the specific demographics of the plan will be used to determine if periods shorter or longer than 20 years may be more appropriate.

Asset Valuation Method

It is the policy of the CalPERS Board of Administration to use professionally accepted amortization methods to eliminate a surplus or an unfunded accrued liability in a manner that maintains benefit security for the members of the System while minimizing substantial variations in required employer contributions. On April 17, 2013, the CalPERS Board of Administration approved a recommendation to change the CalPERS amortization and rate smoothing policies. Beginning with the June 30, 2013 valuations that set the employer contribution for Fiscal Year 2015-16, CalPERS employs a policy that amortizes all gains and losses over a fixed 30-year period. The increase or decrease in the rate is then spread directly over a 5-year period. This method is referred to as "direct rate smoothing." CalPERS no longer uses an actuarial value of assets and only uses the market value of assets. The direct rate smoothing method is equivalent to a method using a 5 year asset smoothing period with no actuarial value of asset corridor and a 25-year amortization period for gains and losses.

PEPRA Normal Cost Rate Methodology

Per Government Code Section 7522.30(b) the "normal cost rate" shall mean the annual actuarially determined normal cost for the plan of retirement benefits provided to the new member and shall be established based on actuarial assumptions used to determine the liabilities and costs as part of the annual actuarial valuation. The plan of retirement benefits shall include any elements that would impact the actuarial determination of the normal cost, including, but not limited to, the retirement formula, eligibility and vesting criteria, ancillary benefit provisions, and any automatic cost-of-living adjustments as determined by the public retirement system.

Each non-pooled plan is considered to be stable with a sufficiently large demographic of actives. It is preferable to determine normal cost using a large active population ongoing so that this rate remains relatively stable. The total PEPRA normal cost will be calculated using all active members within a non-pooled plan. Accordingly, plans will be funded equally between employer and employee based on the demographics of the employees of that employer. As each non-pooled plan builds up to either 100+ active PEPRA members or half of their active population is under the PEPRA formula, the total PEPRA normal cost will be based on the active PEPRA population in the plan.

Actuarial Assumptions

In 2014, CalPERS completed a 2-year asset liability management study incorporating actuarial assumptions and strategic asset allocation. On February 19, 2014, the CalPERS Board of Administration adopted relatively modest changes to the current asset allocation that will reduce the expected volatility of returns. The adopted asset allocation is expected to have a long-term blended return that continues to support a discount rate assumption of 7.5 percent. The Board also approved several changes to the demographic assumptions that more closely align with actual experience. The most significant of these is mortality improvement to acknowledge the greater life expectancies we are seeing in our membership and expected continued improvements. The new actuarial assumptions were first used in the June 30, 2014 valuation to set the Fiscal Year 2016-17 contribution for public agency employers. The increase in liability due to new actuarial assumptions is amortized over a 20-year period with a 5-year ramp-up/ramp-down in accordance with Board policy. These new actuarial assumptions are set forth in this section.

For more details and additional rationale for the selection of the actuarial assumptions, please refer to the CalPERS Experience Study and Review of Actuarial Assumptions report from January 2014 that can be found on the CalPERS website under: "Forms and Publications". Click on "View All" and search for Experience Study.

All actuarial assumptions (except the discount rates used for the hypothetical termination liability) represent an estimate of future experience rather than observations of the estimates inherent in market data.

Economic Assumptions

Discount Rate

7.5 percent compounded annually (net of expenses). This assumption is used for all plans.

Termination Liability Discount Rate

The current discount rate assumption used for termination valuations is a weighted average of the 10-year and 30-year U.S. Treasury yields where the weights are based on matching asset and liability durations as of the termination date.

The hypothetical termination liabilities in this report are calculated using an observed range of market interest rates. This range is based on the lowest and highest 20-year Treasury bond observed during an approximate 2-year period centered around the valuation date. The 20-year Treasury bond has a similar duration to most plan liabilities and serves as a good proxy for the termination discount rate. The 20-year Treasury yield was 2.75 percent on June 30, 2015.

Salary Growth

Annual increases vary by category, entry age, and duration of service. A sample of assumed increases are shown below.

Public Agency Miscellaneous

Duration of Service	(Entry Age 20)	(Entry Age 30)	(Entry Age 40)
0	0.1220	0.1160	0.1020
1	0.0990	0.0940	0.0830
2	0.0860	0.0810	0.0710
3	0.0770	0.0720	0.0630
4	0.0700	0.0650	0.0570
5	0.0640	0.0600	0.0520
10	0.0460	0.0430	0.0390
15	0.0420	0.0400	0.0360
20	0.0390	0.0380	0.0340
25	0.0370	0.0360	0.0330
30	0.0350	0.0340	0.0320

Public Agency Fire

Duration of Service	(Entry Age 20)	(Entry Age 30)	(Entry Age 40)
0	0.2000	0.1980	0.1680
1	0.1490	0.1460	0.1250
2	0.1200	0.1160	0.0990
3	0.0980	0.0940	0.0810
4	0.0820	0.0780	0.0670
5	0.0690	0.0640	0.0550
10	0.0470	0.0460	0.0420
15	0.0440	0.0420	0.0390
20	0.0420	0.0390	0.0360
25	0.0400	0.0370	0.0340
30	0.0380	0.0360	0.0340

Public Agency Police

Duration of Service	(Entry Age 20)	(Entry Age 30)	(Entry Age 40)
0	0.1500	0.1470	0.1310
1	0.1160	0.1120	0.1010
2	0.0950	0.0920	0.0830
3	0.0810	0.0780	0.0700
4	0.0700	0.0670	0.0600
5	0.0610	0.0580	0.0520
10	0.0450	0.0430	0.0370
15	0.0450	0.0430	0.0370
20	0.0450	0.0430	0.0370
25	0.0450	0.0430	0.0370
30	0.0450	0.0430	0.0370

Salary Growth (continued)

Public Agency County Peace Officers

Duration of Service	(Entry Age 20)	(Entry Age 30)	(Entry Age 40)
0	0.1770	0.1670	0.1500
1	0.1340	0.1260	0.1140
2	0.1080	0.1030	0.0940
3	0.0900	0.0860	0.0790
4	0.0760	0.0730	0.0670
5	0.0650	0.0620	0.0580
10	0.0470	0.0450	0.0410
15	0.0460	0.0450	0.0390
20	0.0460	0.0450	0.0380
25	0.0460	0.0450	0.0380
30	0.0460	0.0440	0.0380

Schools

Duration of Service	(Entry Age 20)	(Entry Age 30)	(Entry Age 40)
0	0.0900	0.0880	0.0820
1	0.0780	0.0750	0.0700
2	0.0700	0.0680	0.0630
3	0.0650	0.0630	0.0580
4	0.0610	0.0590	0.0540
5	0.0580	0.0560	0.0510
10	0.0460	0.0450	0.0410
15	0.0420	0.0410	0.0380
20	0.0390	0.0380	0.0350
25	0.0370	0.0350	0.0330
30	0.0350	0.0330	0.0310

- The Miscellaneous salary scale is used for Local Prosecutors.
- The Police salary scale is used for Other Safety, Local Sheriff, and School Police.

Overall Payroll Growth

3.00 percent compounded annually (used in projecting the payroll over which the unfunded liability is amortized). This assumption is used for all plans.

Inflation

2.75 percent compounded annually. This assumption is used for all plans.

Non-valued Potential Additional Liabilities

The potential liability loss for a cost-of-living increase exceeding the 2.75 percent inflation assumption, and any potential liability loss from future member service purchases are not reflected in the valuation.

Miscellaneous Loading Factors

Credit for Unused Sick Leave

Total years of service is increased by 1 percent for those plans that have accepted the provision providing Credit for Unused Sick Leave.

Conversion of Employer Paid Member Contributions (EPMC)

Total years of service is increased by the Employee Contribution Rate for those plans with the provision providing for the Conversion of Employer Paid Member Contributions (EPMC) during the final compensation period.

Norris Decision (Best Factors)

Employees hired prior to July 1, 1982 have projected benefit amounts increased in order to reflect the use of "Best Factors" in the calculation of optional benefit forms. This is due to a 1983 Supreme Court decision, known as the Norris decision, which required males and females to be treated equally in the determination of benefit amounts. Consequently, anyone already employed at that time is given the best possible conversion factor when optional benefits are determined. No loading is necessary for employees hired after July 1, 1982.

Termination Liability

The termination liabilities include a 7 percent contingency load. This load is for unforeseen improvements in mortality.

Demographic Assumptions

Pre-Retirement Mortality

Non-industrial death rates vary by age and gender. Industrial death rates vary by age. See sample rates in table below. The non-industrial death rates are used for all plans. The industrial death rates are used for safety plans (except for Local Prosecutor safety members where the corresponding miscellaneous plan does not have the Industrial Death Benefit).

	Non-Industrial Death (Not Job-Related)		**Industrial Death (Job-Related)**
Age	Male	Female	Male and Female
20	0.00031	0.00020	0.00003
25	0.00040	0.00023	0.00007
30	0.00049	0.00025	0.00010
35	0.00057	0.00035	0.00012
40	0.00075	0.00050	0.00013
45	0.00106	0.00071	0.00014
50	0.00155	0.00100	0.00015
55	0.00228	0.00138	0.00016
60	0.00308	0.00182	0.00017
65	0.00400	0.00257	0.00018
70	0.00524	0.00367	0.00019
75	0.00713	0.00526	0.00020
80	0.00990	0.00814	0.00021

Miscellaneous plans usually have industrial death rates set to zero unless the agency has specifically contracted for industrial death benefits. If so, each non-industrial death rate shown above will be split into two components; 99 percent will become the non-industrial death rate and 1 percent will become the industrial death rate.

Post-Retirement Mortality

Rates vary by age, type of retirement, and gender. See sample rates in table below. These rates are used for all plans.

	Healthy Recipients		Non-Industrially Disabled (Not Job-Related)		Industrially Disabled (Job-Related)	
Age	Male	Female	Male	Female	Male	Female
50	0.00501	0.00466	0.01680	0.01158	0.00501	0.00466
55	0.00599	0.00416	0.01973	0.01149	0.00599	0.00416
60	0.00710	0.00436	0.02289	0.01235	0.00754	0.00518
65	0.00829	0.00588	0.02451	0.01607	0.01122	0.00838
70	0.01305	0.00993	0.02875	0.02211	0.01635	0.01395
75	0.02205	0.01722	0.03990	0.03037	0.02834	0.02319
80	0.03899	0.02902	0.06083	0.04725	0.04899	0.03910
85	0.06969	0.05243	0.09731	0.07762	0.07679	0.06251
90	0.12974	0.09887	0.14804	0.12890	0.12974	0.09887
95	0.22444	0.18489	0.22444	0.21746	0.22444	0.18489
100	0.32536	0.30017	0.32536	0.30017	0.32536	0.30017
105	0.58527	0.56093	0.58527	0.56093	0.58527	0.56093
110	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000

The post-retirement mortality rates above include 20 years of projected on-going mortality improvement using Scale BB published by the Society of Actuaries.

Marital Status

For active members, a percentage who are married upon retirement is assumed according to member category as shown in the following table.

Member Category	Percent Married
Miscellaneous Member	85%
Local Police	90%
Local Fire	90%
Other Local Safety	90%
School Police	90%

Age of Spouse

It is assumed that female spouses are 3 years younger than male spouses. This assumption is used for all plans.

Terminated Members

It is assumed that terminated members refund immediately if non-vested. Terminated members who are vested are assumed to follow the same service retirement pattern as active members but with a load to reflect the expected higher rates of retirement, especially at lower ages. The following table shows the load factors that are applied to the service retirement assumption for active members to obtain the service retirement pattern for separated vested members:

Age	Load Factor Miscellaneous	Load Factor Safety
50	190%	310%
51	110%	190%
52	110%	105%
53 through 54	100%	105%
55	100%	140%
56 and above	100% (no change)	100% (no change)

Termination with Refund

Rates vary by entry age and service for miscellaneous plans. Rates vary by service for safety plans. See sample rates in tables below.

Public Agency Miscellaneous

Duration of Service	Entry Age 20	Entry Age 25	Entry Age 30	Entry Age 35	Entry Age 40	Entry Age 45
0	0.1742	0.1674	0.1606	0.1537	0.1468	0.1400
1	0.1545	0.1477	0.1409	0.1339	0.1271	0.1203
2	0.1348	0.1280	0.1212	0.1142	0.1074	0.1006
3	0.1151	0.1083	0.1015	0.0945	0.0877	0.0809
4	0.0954	0.0886	0.0818	0.0748	0.0680	0.0612
5	0.0212	0.0193	0.0174	0.0155	0.0136	0.0116
10	0.0138	0.0121	0.0104	0.0088	0.0071	0.0055
15	0.0060	0.0051	0.0042	0.0032	0.0023	0.0014
20	0.0037	0.0029	0.0021	0.0013	0.0005	0.0001
25	0.0017	0.0011	0.0005	0.0001	0.0001	0.0001
30	0.0005	0.0001	0.0001	0.0001	0.0001	0.0001
35	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Public Agency Safety

Duration of Service	Fire	Police	County Peace Officer
0	0.0710	0.1013	0.0997
1	0.0554	0.0636	0.0782
2	0.0398	0.0271	0.0566
3	0.0242	0.0258	0.0437
4	0.0218	0.0245	0.0414
5	0.0029	0.0086	0.0145
10	0.0009	0.0053	0.0089
15	0.0006	0.0027	0.0045
20	0.0005	0.0017	0.0020
25	0.0003	0.0012	0.0009
30	0.0003	0.0009	0.0006
35	0.0003	0.0009	0.0006

The police termination and refund rates are also used for Public Agency Local Prosecutors, Other Safety, Local Sheriff, and School Police.

Schools

Duration of Service	Entry Age 20	Entry Age 25	Entry Age 30	Entry Age 35	Entry Age 40	Entry Age 45
0	0.1730	0.1627	0.1525	0.1422	0.1319	0.1217
1	0.1585	0.1482	0.1379	0.1277	0.1174	0.1071
2	0.1440	0.1336	0.1234	0.1131	0.1028	0.0926
3	0.1295	0.1192	0.1089	0.0987	0.0884	0.0781
4	0.1149	0.1046	0.0944	0.0841	0.0738	0.0636
5	0.0278	0.0249	0.0221	0.0192	0.0164	0.0135
10	0.0172	0.0147	0.0122	0.0098	0.0074	0.0049
15	0.0115	0.0094	0.0074	0.0053	0.0032	0.0011
20	0.0073	0.0055	0.0038	0.0020	0.0002	0.0002
25	0.0037	0.0023	0.0010	0.0002	0.0002	0.0002
30	0.0015	0.0003	0.0002	0.0002	0.0002	0.0002
35	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002

Termination with Vested Benefits

Rates vary by entry age and service for miscellaneous plans. Rates vary by service for safety plans. See sample rates in tables below.

Public Agency Miscellaneous

Duration of Service	Entry Age 20	Entry Age 25	Entry Age 30	Entry Age 35	Entry Age 40
5	0.0656	0.0597	0.0537	0.0477	0.0418
10	0.0530	0.0466	0.0403	0.0339	0.0000
15	0.0443	0.0373	0.0305	0.0000	0.0000
20	0.0333	0.0261	0.0000	0.0000	0.0000
25	0.0212	0.0000	0.0000	0.0000	0.0000
30	0.0000	0.0000	0.0000	0.0000	0.0000
35	0.0000	0.0000	0.0000	0.0000	0.0000

Public Agency Safety

Duration of Service	Fire	Police	County Peace Officer
5	0.0162	0.0163	0.0265
10	0.0061	0.0126	0.0204
15	0.0058	0.0082	0.0130
20	0.0053	0.0065	0.0074
25	0.0047	0.0058	0.0043
30	0.0045	0.0056	0.0030
35	0.0000	0.0000	0.0000

- When a member is eligible to retire, the termination with vested benefits probability is set to zero.
- After termination with vested benefits, a miscellaneous member is assumed to retire at age 59 and a safety member at age 54.
- The Police termination with vested benefits rates are also used for Public Agency Local Prosecutors, Other Safety, Local Sheriff, and School Police.

Schools

Duration of Service	Entry Age 20	Entry Age 25	Entry Age 30	Entry Age 35	Entry Age 40
5	0.0816	0.0733	0.0649	0.0566	0.0482
10	0.0629	0.0540	0.0450	0.0359	0.0000
15	0.0537	0.0440	0.0344	0.0000	0.0000
20	0.0420	0.0317	0.0000	0.0000	0.0000
25	0.0291	0.0000	0.0000	0.0000	0.0000
30	0.0000	0.0000	0.0000	0.0000	0.0000
35	0.0000	0.0000	0.0000	0.0000	0.0000

Non-Industrial (Not Job-Related) Disability

Rates vary by age and gender for miscellaneous plans. Rates vary by age and category for safety plans.

	Miscellaneous		Fire	Police	County Peace Officer	Schools	
Age	Male	Female	Male and Female	Male and Female	Male and Female	Male	Female
20	0.0002	0.0001	0.0001	0.0001	0.0001	0.0003	0.0003
25	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
30	0.0002	0.0002	0.0001	0.0002	0.0001	0.0001	0.0002
35	0.0005	0.0008	0.0001	0.0003	0.0004	0.0005	0.0004
40	0.0012	0.0016	0.0001	0.0004	0.0007	0.0015	0.0010
45	0.0019	0.0022	0.0002	0.0005	0.0013	0.0030	0.0019
50	0.0021	0.0023	0.0005	0.0008	0.0018	0.0039	0.0024
55	0.0022	0.0018	0.0010	0.0013	0.0010	0.0036	0.0021
60	0.0022	0.0014	0.0015	0.0020	0.0006	0.0031	0.0014

- The miscellaneous non-industrial disability rates are used for Local Prosecutors.
- The police non-industrial disability rates are also used for Other Safety, Local Sheriff, and School Police.

Industrial (Job-Related) Disability

Rates vary by age and category.

Age	Fire	Police	County Peace Officer
20	0.0001	0.0000	0.0004
25	0.0003	0.0017	0.0013
30	0.0007	0.0048	0.0025
35	0.0016	0.0079	0.0037
40	0.0030	0.0110	0.0051
45	0.0053	0.0141	0.0067
50	0.0277	0.0185	0.0092
55	0.0409	0.0479	0.0151
60	0.0583	0.0602	0.0174

- The police industrial disability rates are also used for Local Sheriff and Other Safety.
- Fifty percent of the police industrial disability rates are used for School Police.
- One percent of the police industrial disability rates are used for Local Prosecutors.
- Normally, rates are zero for miscellaneous plans unless the agency has specifically contracted for industrial disability benefits. If so, each miscellaneous non-industrial disability rate will be split into two components: 50 percent will become the non-industrial disability rate and 50 percent will become the industrial disability rate.

Service Retirement

Retirement rates vary by age, service, and formula, except for the safety ½ @ 55 and 2% @ 55 formulas, where retirement rates vary by age only.

Service Retirement

Public Agency Miscellaneous 1.5% @ 65

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.008	0.011	0.013	0.015	0.017	0.019
51	0.007	0.010	0.012	0.013	0.015	0.017
52	0.010	0.014	0.017	0.019	0.021	0.024
53	0.008	0.012	0.015	0.017	0.019	0.022
54	0.012	0.016	0.019	0.022	0.025	0.028
55	0.018	0.025	0.031	0.035	0.038	0.043
56	0.015	0.021	0.025	0.029	0.032	0.036
57	0.020	0.028	0.033	0.038	0.043	0.048
58	0.024	0.033	0.040	0.046	0.052	0.058
59	0.028	0.039	0.048	0.054	0.060	0.067
60	0.049	0.069	0.083	0.094	0.105	0.118
61	0.062	0.087	0.106	0.120	0.133	0.150
62	0.104	0.146	0.177	0.200	0.223	0.251
63	0.099	0.139	0.169	0.191	0.213	0.239
64	0.097	0.136	0.165	0.186	0.209	0.233
65	0.140	0.197	0.240	0.271	0.302	0.339
66	0.092	0.130	0.157	0.177	0.198	0.222
67	0.129	0.181	0.220	0.249	0.277	0.311
68	0.092	0.129	0.156	0.177	0.197	0.221
69	0.092	0.130	0.158	0.178	0.199	0.224
70	0.103	0.144	0.175	0.198	0.221	0.248

Public Agency Miscellaneous 2% @ 60

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.010	0.013	0.015	0.018	0.019	0.021
51	0.009	0.011	0.014	0.016	0.017	0.019
52	0.011	0.014	0.017	0.020	0.022	0.024
53	0.010	0.012	0.015	0.017	0.020	0.021
54	0.015	0.019	0.023	0.025	0.029	0.031
55	0.022	0.029	0.035	0.040	0.045	0.049
56	0.018	0.024	0.028	0.033	0.036	0.040
57	0.024	0.032	0.038	0.043	0.049	0.053
58	0.027	0.036	0.043	0.049	0.055	0.061
59	0.033	0.044	0.054	0.061	0.068	0.076
60	0.056	0.077	0.092	0.105	0.117	0.130
61	0.071	0.097	0.118	0.134	0.149	0.166
62	0.117	0.164	0.198	0.224	0.250	0.280
63	0.122	0.171	0.207	0.234	0.261	0.292
64	0.114	0.159	0.193	0.218	0.244	0.271
65	0.150	0.209	0.255	0.287	0.321	0.358
66	0.114	0.158	0.192	0.217	0.243	0.270
67	0.141	0.196	0.238	0.270	0.301	0.337
68	0.103	0.143	0.174	0.196	0.219	0.245
69	0.109	0.153	0.185	0.209	0.234	0.261
70	0.117	0.162	0.197	0.222	0.248	0.277

Service Retirement

Public Agency Miscellaneous 2% @ 55

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.014	0.018	0.021	0.025	0.027	0.031
51	0.012	0.014	0.017	0.020	0.021	0.025
52	0.013	0.017	0.019	0.023	0.025	0.028
53	0.015	0.020	0.023	0.027	0.030	0.034
54	0.026	0.033	0.038	0.045	0.051	0.059
55	0.048	0.061	0.074	0.088	0.100	0.117
56	0.042	0.053	0.063	0.075	0.085	0.100
57	0.044	0.056	0.067	0.081	0.091	0.107
58	0.049	0.062	0.074	0.089	0.100	0.118
59	0.057	0.072	0.086	0.103	0.118	0.138
60	0.067	0.086	0.103	0.123	0.139	0.164
61	0.081	0.103	0.124	0.148	0.168	0.199
62	0.116	0.147	0.178	0.214	0.243	0.288
63	0.114	0.144	0.174	0.208	0.237	0.281
64	0.108	0.138	0.166	0.199	0.227	0.268
65	0.155	0.197	0.238	0.285	0.325	0.386
66	0.132	0.168	0.203	0.243	0.276	0.328
67	0.122	0.155	0.189	0.225	0.256	0.304
68	0.111	0.141	0.170	0.204	0.232	0.274
69	0.114	0.144	0.174	0.209	0.238	0.282
70	0.130	0.165	0.200	0.240	0.272	0.323

Public Agency Miscellaneous 2.5% @ 55

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.004	0.009	0.019	0.029	0.049	0.094
51	0.004	0.009	0.019	0.029	0.049	0.094
52	0.004	0.009	0.020	0.030	0.050	0.095
53	0.008	0.014	0.025	0.036	0.058	0.104
54	0.024	0.034	0.050	0.066	0.091	0.142
55	0.066	0.088	0.115	0.142	0.179	0.241
56	0.042	0.057	0.078	0.098	0.128	0.184
57	0.041	0.057	0.077	0.097	0.128	0.183
58	0.045	0.061	0.083	0.104	0.136	0.192
59	0.055	0.074	0.098	0.123	0.157	0.216
60	0.066	0.088	0.115	0.142	0.179	0.241
61	0.072	0.095	0.124	0.153	0.191	0.255
62	0.099	0.130	0.166	0.202	0.248	0.319
63	0.092	0.121	0.155	0.189	0.233	0.302
64	0.091	0.119	0.153	0.187	0.231	0.299
65	0.122	0.160	0.202	0.245	0.297	0.374
66	0.138	0.179	0.226	0.272	0.329	0.411
67	0.114	0.149	0.189	0.229	0.279	0.354
68	0.100	0.131	0.168	0.204	0.250	0.322
69	0.114	0.149	0.189	0.229	0.279	0.354
70	0.127	0.165	0.209	0.253	0.306	0.385

Service Retirement

Public Agency Miscellaneous 2.7% @ 55

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.004	0.009	0.014	0.035	0.055	0.095
51	0.002	0.006	0.011	0.030	0.050	0.090
52	0.006	0.012	0.017	0.038	0.059	0.099
53	0.010	0.017	0.024	0.046	0.068	0.110
54	0.032	0.044	0.057	0.085	0.113	0.160
55	0.076	0.101	0.125	0.165	0.205	0.265
56	0.055	0.074	0.093	0.127	0.160	0.214
57	0.050	0.068	0.086	0.118	0.151	0.204
58	0.055	0.074	0.093	0.127	0.161	0.215
59	0.061	0.082	0.102	0.138	0.174	0.229
60	0.069	0.093	0.116	0.154	0.192	0.250
61	0.086	0.113	0.141	0.183	0.225	0.288
62	0.105	0.138	0.171	0.218	0.266	0.334
63	0.103	0.135	0.167	0.215	0.262	0.329
64	0.109	0.143	0.177	0.226	0.275	0.344
65	0.134	0.174	0.215	0.270	0.326	0.401
66	0.147	0.191	0.235	0.294	0.354	0.433
67	0.121	0.158	0.196	0.248	0.300	0.372
68	0.113	0.147	0.182	0.232	0.282	0.352
69	0.117	0.153	0.189	0.240	0.291	0.362
70	0.141	0.183	0.226	0.283	0.341	0.418

Public Agency Miscellaneous 3% @ 60

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.012	0.018	0.024	0.039	0.040	0.091
51	0.009	0.014	0.019	0.034	0.034	0.084
52	0.014	0.020	0.026	0.043	0.044	0.096
53	0.016	0.023	0.031	0.048	0.050	0.102
54	0.026	0.036	0.045	0.065	0.070	0.125
55	0.043	0.057	0.072	0.096	0.105	0.165
56	0.042	0.056	0.070	0.094	0.103	0.162
57	0.049	0.065	0.082	0.108	0.119	0.180
58	0.057	0.076	0.094	0.122	0.136	0.199
59	0.076	0.100	0.123	0.157	0.175	0.244
60	0.114	0.148	0.182	0.226	0.255	0.334
61	0.095	0.123	0.152	0.190	0.214	0.288
62	0.133	0.172	0.211	0.260	0.294	0.378
63	0.129	0.166	0.204	0.252	0.285	0.368
64	0.143	0.185	0.226	0.278	0.315	0.401
65	0.202	0.260	0.318	0.386	0.439	0.542
66	0.177	0.228	0.279	0.340	0.386	0.482
67	0.151	0.194	0.238	0.292	0.331	0.420
68	0.139	0.179	0.220	0.270	0.306	0.391
69	0.190	0.245	0.299	0.364	0.414	0.513
70	0.140	0.182	0.223	0.274	0.310	0.396

Service Retirement

Public Agency Miscellaneous 2% @ 62

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.000	0.000	0.000	0.000	0.000	0.000
51	0.000	0.000	0.000	0.000	0.000	0.000
52	0.010	0.013	0.016	0.019	0.022	0.024
53	0.013	0.017	0.020	0.024	0.027	0.031
54	0.021	0.027	0.033	0.039	0.045	0.050
55	0.044	0.056	0.068	0.080	0.092	0.104
56	0.030	0.039	0.047	0.055	0.063	0.072
57	0.036	0.046	0.056	0.066	0.076	0.086
58	0.046	0.059	0.072	0.085	0.097	0.110
59	0.058	0.074	0.089	0.105	0.121	0.137
60	0.062	0.078	0.095	0.112	0.129	0.146
61	0.062	0.079	0.096	0.113	0.129	0.146
62	0.097	0.123	0.150	0.176	0.202	0.229
63	0.089	0.113	0.137	0.162	0.186	0.210
64	0.094	0.120	0.145	0.171	0.197	0.222
65	0.129	0.164	0.199	0.234	0.269	0.304
66	0.105	0.133	0.162	0.190	0.219	0.247
67	0.105	0.133	0.162	0.190	0.219	0.247
68	0.105	0.133	0.162	0.190	0.219	0.247
69	0.105	0.133	0.162	0.190	0.219	0.247
70	0.125	0.160	0.194	0.228	0.262	0.296

Service Retirement

Public Agency Fire ½ @ 55 and 2% @ 55

Age	Rate	Age	Rate
50	0.0159	56	0.1108
51	0.0000	57	0.0000
52	0.0344	58	0.0950
53	0.0199	59	0.0441
54	0.0413	60	1.00000
55	0.0751		

Public Agency Police ½ @ 55 and 2% @ 55

Age	Rate	Age	Rate
50	0.0255	56	0.0692
51	0.0000	57	0.0511
52	0.0164	58	0.0724
53	0.0272	59	0.0704
54	0.0095	60	1.0000
55	0.1667		

Service Retirement

Public Agency Police 2% @ 50

Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.005	0.005	0.005	0.005	0.017	0.089
51	0.005	0.005	0.005	0.005	0.017	0.087
52	0.018	0.018	0.018	0.018	0.042	0.132
53	0.044	0.044	0.044	0.044	0.090	0.217
54	0.065	0.065	0.065	0.065	0.126	0.283
55	0.086	0.086	0.086	0.086	0.166	0.354
56	0.067	0.067	0.067	0.067	0.130	0.289
57	0.066	0.066	0.066	0.066	0.129	0.288
58	0.066	0.066	0.066	0.066	0.129	0.288
59	0.139	0.139	0.139	0.139	0.176	0.312
60	0.123	0.123	0.123	0.123	0.153	0.278
61	0.110	0.110	0.110	0.110	0.138	0.256
62	0.130	0.130	0.130	0.130	0.162	0.291
63	0.130	0.130	0.130	0.130	0.162	0.291
64	0.130	0.130	0.130	0.130	0.162	0.291
65	1.000	1.000	1.000	1.000	1.000	1.000

- These rates also apply to Local Prosecutors, Local Sheriff, School Police, and Other Safety.

Service Retirement

Public Agency Fire 2% @ 50

Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.009	0.009	0.009	0.009	0.013	0.020
51	0.013	0.013	0.013	0.013	0.020	0.029
52	0.018	0.018	0.018	0.018	0.028	0.042
53	0.052	0.052	0.052	0.052	0.079	0.119
54	0.067	0.067	0.067	0.067	0.103	0.154
55	0.089	0.089	0.089	0.089	0.136	0.204
56	0.083	0.083	0.083	0.083	0.127	0.190
57	0.082	0.082	0.082	0.082	0.126	0.189
58	0.088	0.088	0.088	0.088	0.136	0.204
59	0.074	0.074	0.074	0.074	0.113	0.170
60	0.100	0.100	0.100	0.100	0.154	0.230
61	0.072	0.072	0.072	0.072	0.110	0.165
62	0.099	0.099	0.099	0.099	0.152	0.228
63	0.114	0.114	0.114	0.114	0.175	0.262
64	0.114	0.114	0.114	0.114	0.175	0.262
65	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement

Public Agency Police 3% @ 55

Age	Duration of Service 5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.004	0.004	0.004	0.004	0.015	0.086
51	0.014	0.014	0.014	0.014	0.034	0.114
52	0.026	0.026	0.026	0.026	0.060	0.154
53	0.038	0.038	0.038	0.038	0.083	0.188
54	0.071	0.071	0.071	0.071	0.151	0.292
55	0.061	0.061	0.061	0.061	0.131	0.261
56	0.072	0.072	0.072	0.072	0.153	0.295
57	0.065	0.065	0.065	0.065	0.140	0.273
58	0.066	0.066	0.066	0.066	0.142	0.277
59	0.118	0.118	0.118	0.118	0.247	0.437
60	0.065	0.065	0.065	0.065	0.138	0.272
61	0.084	0.084	0.084	0.084	0.178	0.332
62	0.108	0.108	0.108	0.108	0.226	0.405
63	0.084	0.084	0.084	0.084	0.178	0.332
64	0.084	0.084	0.084	0.084	0.178	0.332
65	1.000	1.000	1.000	1.000	1.000	1.000

- These rates also apply to Local Prosecutors, Local Sheriff, School Police, and Other Safety.

Service Retirement

Public Agency Fire 3% @ 55

Age	Duration of Service 5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.001	0.001	0.001	0.006	0.016	0.069
51	0.002	0.002	0.002	0.006	0.018	0.071
52	0.012	0.012	0.012	0.021	0.040	0.098
53	0.032	0.032	0.032	0.049	0.085	0.149
54	0.057	0.057	0.057	0.087	0.144	0.217
55	0.073	0.073	0.073	0.109	0.179	0.259
56	0.064	0.064	0.064	0.097	0.161	0.238
57	0.063	0.063	0.063	0.095	0.157	0.233
58	0.065	0.065	0.065	0.099	0.163	0.241
59	0.088	0.088	0.088	0.131	0.213	0.299
60	0.105	0.105	0.105	0.155	0.251	0.344
61	0.118	0.118	0.118	0.175	0.282	0.380
62	0.087	0.087	0.087	0.128	0.210	0.295
63	0.067	0.067	0.067	0.100	0.165	0.243
64	0.067	0.067	0.067	0.100	0.165	0.243
65	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement

Public Agency Police 3% @ 50

Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.050	0.050	0.050	0.099	0.240	0.314
51	0.034	0.034	0.034	0.072	0.198	0.260
52	0.033	0.033	0.033	0.071	0.198	0.259
53	0.039	0.039	0.039	0.080	0.212	0.277
54	0.045	0.045	0.045	0.092	0.229	0.300
55	0.052	0.052	0.052	0.105	0.248	0.323
56	0.042	0.042	0.042	0.087	0.221	0.289
57	0.043	0.043	0.043	0.088	0.223	0.292
58	0.054	0.054	0.054	0.109	0.255	0.333
59	0.054	0.054	0.054	0.108	0.253	0.330
60	0.060	0.060	0.060	0.121	0.272	0.355
61	0.048	0.048	0.048	0.098	0.238	0.311
62	0.061	0.061	0.061	0.122	0.274	0.357
63	0.057	0.057	0.057	0.115	0.263	0.343
64	0.069	0.069	0.069	0.137	0.296	0.385
65	1.000	1.000	1.000	1.000	1.000	1.000

- These rates also apply to Local Prosecutors, Local Sheriff, School Police, and Other Safety.

Service Retirement

Public Agency Fire 3% @ 50

Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.020	0.020	0.020	0.040	0.130	0.192
51	0.008	0.008	0.008	0.023	0.107	0.164
52	0.023	0.023	0.023	0.043	0.136	0.198
53	0.023	0.023	0.023	0.043	0.135	0.198
54	0.027	0.027	0.027	0.048	0.143	0.207
55	0.043	0.043	0.043	0.070	0.174	0.244
56	0.053	0.053	0.053	0.085	0.196	0.269
57	0.054	0.054	0.054	0.086	0.197	0.271
58	0.052	0.052	0.052	0.084	0.193	0.268
59	0.075	0.075	0.075	0.116	0.239	0.321
60	0.065	0.065	0.065	0.102	0.219	0.298
61	0.076	0.076	0.076	0.117	0.241	0.324
62	0.068	0.068	0.068	0.106	0.224	0.304
63	0.027	0.027	0.027	0.049	0.143	0.208
64	0.094	0.094	0.094	0.143	0.277	0.366
65	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement

Public Agency Police 2% @ 57

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.011	0.011	0.011	0.011	0.020	0.036
51	0.009	0.009	0.009	0.009	0.016	0.028
52	0.018	0.018	0.018	0.018	0.034	0.060
53	0.037	0.037	0.037	0.037	0.067	0.119
54	0.049	0.049	0.049	0.049	0.089	0.159
55	0.063	0.063	0.063	0.063	0.115	0.205
56	0.045	0.045	0.045	0.045	0.082	0.146
57	0.064	0.064	0.064	0.064	0.117	0.209
58	0.047	0.047	0.047	0.047	0.086	0.154
59	0.105	0.105	0.105	0.105	0.130	0.191
60	0.105	0.105	0.105	0.105	0.129	0.188
61	0.105	0.105	0.105	0.105	0.129	0.188
62	0.105	0.105	0.105	0.105	0.129	0.188
63	0.105	0.105	0.105	0.105	0.129	0.188
64	0.105	0.105	0.105	0.105	0.129	0.188
65	1.000	1.000	1.000	1.000	1.000	1.000

- These rates also apply to Local Prosecutors, Local Sheriff, School Police, and Other Safety.

Service Retirement

Public Agency Fire 2% @ 57

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.005	0.005	0.005	0.005	0.008	0.012
51	0.006	0.006	0.006	0.006	0.009	0.013
52	0.012	0.012	0.012	0.012	0.019	0.028
53	0.033	0.033	0.033	0.033	0.050	0.075
54	0.045	0.045	0.045	0.045	0.069	0.103
55	0.061	0.061	0.061	0.061	0.094	0.140
56	0.055	0.055	0.055	0.055	0.084	0.126
57	0.081	0.081	0.081	0.081	0.125	0.187
58	0.059	0.059	0.059	0.059	0.091	0.137
59	0.055	0.055	0.055	0.055	0.084	0.126
60	0.085	0.085	0.085	0.085	0.131	0.196
61	0.085	0.085	0.085	0.085	0.131	0.196
62	0.085	0.085	0.085	0.085	0.131	0.196
63	0.085	0.085	0.085	0.085	0.131	0.196
64	0.085	0.085	0.085	0.085	0.131	0.196
65	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement

Public Agency Police 2.5% @ 57

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.014	0.014	0.014	0.014	0.025	0.045
51	0.012	0.012	0.012	0.012	0.021	0.038
52	0.025	0.025	0.025	0.025	0.046	0.081
53	0.047	0.047	0.047	0.047	0.086	0.154
54	0.063	0.063	0.063	0.063	0.115	0.205
55	0.076	0.076	0.076	0.076	0.140	0.249
56	0.054	0.054	0.054	0.054	0.099	0.177
57	0.071	0.071	0.071	0.071	0.130	0.232
58	0.057	0.057	0.057	0.057	0.103	0.184
59	0.126	0.126	0.126	0.126	0.156	0.229
60	0.126	0.126	0.126	0.126	0.155	0.226
61	0.126	0.126	0.126	0.126	0.155	0.226
62	0.126	0.126	0.126	0.126	0.155	0.226
63	0.126	0.126	0.126	0.126	0.155	0.226
64	0.126	0.126	0.126	0.126	0.155	0.226
65	1.000	1.000	1.000	1.000	1.000	1.000

- These rates also apply to Local Prosecutors, Local Sheriff, School Police, and Other Safety.

Service Retirement

Public Agency Fire 2.5% @ 57

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.007	0.007	0.007	0.007	0.010	0.015
51	0.008	0.008	0.008	0.008	0.012	0.018
52	0.016	0.016	0.016	0.016	0.025	0.038
53	0.042	0.042	0.042	0.042	0.064	0.096
54	0.057	0.057	0.057	0.057	0.088	0.132
55	0.074	0.074	0.074	0.074	0.114	0.170
56	0.066	0.066	0.066	0.066	0.102	0.153
57	0.090	0.090	0.090	0.090	0.139	0.208
58	0.071	0.071	0.071	0.071	0.110	0.164
59	0.066	0.066	0.066	0.066	0.101	0.151
60	0.102	0.102	0.102	0.102	0.157	0.235
61	0.102	0.102	0.102	0.102	0.157	0.236
62	0.102	0.102	0.102	0.102	0.157	0.236
63	0.102	0.102	0.102	0.102	0.157	0.236
64	0.102	0.102	0.102	0.102	0.157	0.236
65	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement

Public Agency Police 2.7% @ 57

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.0138	0.0138	0.0138	0.0138	0.0253	0.0451
51	0.0123	0.0123	0.0123	0.0123	0.0226	0.0402
52	0.0249	0.0249	0.0249	0.0249	0.0456	0.0812
53	0.0497	0.0497	0.0497	0.0497	0.0909	0.1621
54	0.0662	0.0662	0.0662	0.0662	0.1211	0.2160
55	0.0854	0.0854	0.0854	0.0854	0.1563	0.2785
56	0.0606	0.0606	0.0606	0.0606	0.1108	0.1975
57	0.0711	0.0711	0.0711	0.0711	0.1300	0.2318
58	0.0628	0.0628	0.0628	0.0628	0.1149	0.2049
59	0.1396	0.1396	0.1396	0.1396	0.1735	0.2544
60	0.1396	0.1396	0.1396	0.1396	0.1719	0.2506
61	0.1396	0.1396	0.1396	0.1396	0.1719	0.2506
62	0.1396	0.1396	0.1396	0.1396	0.1719	0.2506
63	0.1396	0.1396	0.1396	0.1396	0.1719	0.2506
64	0.1396	0.1396	0.1396	0.1396	0.1719	0.2506
65	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

- These rates also apply to Local Prosecutors, Local Sheriff, School Police, and Other Safety.

Service Retirement

Public Agency Fire 2.7% @ 57

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.0065	0.0065	0.0065	0.0065	0.0101	0.0151
51	0.0081	0.0081	0.0081	0.0081	0.0125	0.0187
52	0.0164	0.0164	0.0164	0.0164	0.0254	0.0380
53	0.0442	0.0442	0.0442	0.0442	0.0680	0.1018
54	0.0606	0.0606	0.0606	0.0606	0.0934	0.1397
55	0.0825	0.0825	0.0825	0.0825	0.1269	0.1900
56	0.0740	0.0740	0.0740	0.0740	0.1140	0.1706
57	0.0901	0.0901	0.0901	0.0901	0.1387	0.2077
58	0.0790	0.0790	0.0790	0.0790	0.1217	0.1821
59	0.0729	0.0729	0.0729	0.0729	0.1123	0.1681
60	0.1135	0.1135	0.1135	0.1135	0.1747	0.2615
61	0.1136	0.1136	0.1136	0.1136	0.1749	0.2618
62	0.1136	0.1136	0.1136	0.1136	0.1749	0.2618
63	0.1136	0.1136	0.1136	0.1136	0.1749	0.2618
64	0.1136	0.1136	0.1136	0.1136	0.1749	0.2618
65	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Service Retirement

Schools 2% @ 55

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.005	0.009	0.013	0.015	0.016	0.018
51	0.005	0.010	0.014	0.017	0.019	0.021
52	0.006	0.012	0.017	0.020	0.022	0.025
53	0.007	0.014	0.019	0.023	0.026	0.029
54	0.012	0.024	0.033	0.039	0.044	0.049
55	0.024	0.048	0.067	0.079	0.088	0.099
56	0.020	0.039	0.055	0.065	0.072	0.081
57	0.021	0.042	0.059	0.070	0.078	0.087
58	0.025	0.050	0.070	0.083	0.092	0.103
59	0.029	0.057	0.080	0.095	0.105	0.118
60	0.037	0.073	0.102	0.121	0.134	0.150
61	0.046	0.090	0.126	0.149	0.166	0.186
62	0.076	0.151	0.212	0.250	0.278	0.311
63	0.069	0.136	0.191	0.225	0.251	0.281
64	0.067	0.133	0.185	0.219	0.244	0.273
65	0.091	0.180	0.251	0.297	0.331	0.370
66	0.072	0.143	0.200	0.237	0.264	0.295
67	0.067	0.132	0.185	0.218	0.243	0.272
68	0.060	0.118	0.165	0.195	0.217	0.243
69	0.067	0.133	0.187	0.220	0.246	0.275
70	0.066	0.131	0.183	0.216	0.241	0.270

Miscellaneous

Internal Revenue Code Section 415

The limitations on benefits imposed by Internal Revenue Code Section 415 are taken into account in this valuation. Each year the impact of any changes in this limitation since the prior valuation is included and amortized as part of the actuarial gain or loss base. This results in lower contributions for those employers contributing to the Replacement Benefit Fund and protects CalPERS from prefunding expected benefits in excess of limits imposed by federal tax law.

Internal Revenue Code Section 401(a)(17)

The limitations on compensation imposed by Internal Revenue Code Section 401(a)(17) are taken into account in this valuation. Each year, the impact of any changes in the compensation limitation since the prior valuation is included and amortized as part of the actuarial gain or loss base. The compensation limit for classic members for the 2015 calendar year is $265,000.

APPENDIX B

PRINCIPAL PLAN PROVISIONS

The following is a description of the principal plan provisions used in calculating costs and liabilities. We have indicated whether a plan provision is standard or optional. Standard benefits are applicable to all members while optional benefits vary among employers. Optional benefits that apply to a single period of time, such as Golden Handshakes, have not been included. Many of the statements in this summary are general in nature, and are intended to provide an easily understood summary of the Public Employees' Retirement Law. The law itself governs in all situations.

Service Retirement

Eligibility

A classic CalPERS member or PEPRA Safety member becomes eligible for Service Retirement upon attainment of age 50 with at least 5 years of credited service (total service across all CalPERS employers, and with certain other retirement systems with which CalPERS has reciprocity agreements). For employees hired into a plan with the 1.5 percent at 65 formula, eligibility for service retirement is age 55 with at least 5 years of service. PEPRA miscellaneous members become eligible for service retirement upon attainment of age 52 with at least 5 years of service.

Benefit

The service retirement benefit is a monthly allowance equal to the product of the *benefit factor*, *years of service*, and *final compensation.*

- The *benefit factor* depends on the benefit formula specified in your agency's contract. The table below shows the factors for each of the available formulas. Factors vary by the member's age at retirement. Listed are the factors for retirement at whole year ages:

Miscellaneous Plan Formulas

Retirement Age	1.5% at 65	2% at 60	2% at 55	2.5% at 55	2.7% at 55	3% at 60	PEPRA 2% at 62
50	0.5000%	1.092%	1.426%	2.000%	2.000%	2.000%	N/A
51	0.5667%	1.156%	1.522%	2.100%	2.140%	2.100%	N/A
52	0.6334%	1.224%	1.628%	2.200%	2.280%	2.200%	1.000%
53	0.7000%	1.296%	1.742%	2.300%	2.420%	2.300%	1.100%
54	0.7667%	1.376%	1.866%	2.400%	2.560%	2.400%	1.200%
55	0.8334%	1.460%	2.000%	2.500%	2.700%	2.500%	1.300%
56	0.9000%	1.552%	2.052%	2.500%	2.700%	2.600%	1.400%
57	0.9667%	1.650%	2.104%	2.500%	2.700%	2.700%	1.500%
58	1.0334%	1.758%	2.156%	2.500%	2.700%	2.800%	1.600%
59	1.1000%	1.874%	2.210%	2.500%	2.700%	2.900%	1.700%
60	1.1667%	2.000%	2.262%	2.500%	2.700%	3.000%	1.800%
61	1.2334%	2.134%	2.314%	2.500%	2.700%	3.000%	1.900%
62	1.3000%	2.272%	2.366%	2.500%	2.700%	3.000%	2.000%
63	1.3667%	2.418%	2.418%	2.500%	2.700%	3.000%	2.100%
64	1.4334%	2.418%	2.418%	2.500%	2.700%	3.000%	2.200%
65	1.5000%	2.418%	2.418%	2.500%	2.700%	3.000%	2.300%
66	1.5000%	2.418%	2.418%	2.500%	2.700%	3.000%	2.400%
67 & up	1.5000%	2.418%	2.418%	2.500%	2.700%	3.000%	2.500%

Safety Plan Formulas

Retirement Age	½ at 55 *	2% at 55	2% at 50	3% at 55	3% at 50
50	1.783%	1.426%	2.000%	2.400%	3.000%
51	1.903%	1.522%	2.140%	2.520%	3.000%
52	2.035%	1.628%	2.280%	2.640%	3.000%
53	2.178%	1.742%	2.420%	2.760%	3.000%
54	2.333%	1.866%	2.560%	2.880%	3.000%
55 & Up	2.500%	2.000%	2.700%	3.000%	3.000%

* For this formula, the benefit factor also varies by entry age. The factors shown are for members with an entry age of 35 or greater. If entry age is less than 35, then the age 55 benefit factor is 50 percent divided by the difference between age 55 and entry age. The benefit factor for ages prior to age 55 is the same proportion of the age 55 benefit factor as in the above table.

PEPRA Safety Plan Formulas

Retirement Age	2% at 57	2.5% at 57	2.7% at 57
50	1.426%	2.000%	2.000%
51	1.508%	2.071%	2.100%
52	1.590%	2.143%	2.200%
53	1.672%	2.214%	2.300%
54	1.754%	2.286%	2.400%
55	1.836%	2.357%	2.500%
56	1.918%	2.429%	2.600%
57 & Up	2.000%	2.500%	2.700%

- The *years of service* is the amount credited by CalPERS to a member while he or she is employed in this group (or for other periods that are recognized under the employer's contract with CalPERS). For a member who has earned service with multiple CalPERS employers, the benefit from each employer is calculated separately according to each employer's contract, and then added together for the total allowance. An agency may contract for an optional benefit where any unused sick leave accumulated at the time of retirement will be converted to credited service at a rate of 0.004 years of service for each day of sick leave.

- The *final compensation* is the monthly average of the member's highest 36 or 12 consecutive months' full-time equivalent monthly pay (no matter which CalPERS employer paid this compensation). The standard benefit is 36 months. Employers had the option of providing a final compensation equal to the highest 12 consecutive months for classic plans only. Final compensation must be defined by the highest 36 consecutive months' pay under the 1.5% at 65 formula. PEPRA members have a cap on the annual salary that can be used to calculate final compensation for all new members based on the Social Security contribution and benefit base. For employees that participate in Social Security this cap is $117,020 for 2015 and for those employees that do not participate in Social Security the cap for 2015 is $140,424. Adjustments to the caps are permitted annually based on changes to the CPI for all urban consumers.

- Employees must be covered by Social Security with the 1.5% at 65 formula. Social Security is optional for all other benefit formulas. For employees covered by Social Security, the modified formula is the standard benefit. Under this type of formula, the final compensation is offset by $133.33 (or by one third if the final compensation is less than $400). Employers may contract for the full benefit with Social Security that will eliminate the offset applicable to the final compensation. For employees not covered by Social Security, the full benefit is paid with no offsets. Auxiliary organizations of the CSUC system may elect reduced contribution rates, in which case the offset is $317 if members are not covered by Social Security or $513 if members are covered by Social Security.

- The miscellaneous and PEPRA safety service retirement benefit is not capped. The classic service retirement benefit is capped at 90 percent of final compensation.

Vested Deferred Retirement

Eligibility for Deferred Status

A CalPERS member becomes eligible for a deferred vested retirement benefit when he or she leaves employment, keeps his or her contribution account balance on deposit with CalPERS, **and** has earned at least 5 years of credited service (total service across all CalPERS employers, and with certain other retirement systems with which CalPERS has reciprocity agreements).

Eligibility to Start Receiving Benefits

The CalPERS classic members and PEPRA safety members become eligible to receive the deferred retirement benefit upon satisfying the eligibility requirements for deferred status and upon attainment of age 50 (55 for employees hired into a 1.5% @ 65 plan). PEPRA miscellaneous members become eligible to receive the deferred retirement benefit upon satisfying the eligibility requirements for deferred status and upon attainment of age 52.

Benefit

The vested deferred retirement benefit is the same as the service retirement benefit, where the benefit factor is based on the member's age at allowance commencement. For members who have earned service with multiple CalPERS employers, the benefit from each employer is calculated separately according to each employer's contract, and then added together for the total allowance.

Non-Industrial (Non-Job Related) Disability Retirement

Eligibility

A CalPERS member is eligible for Non-Industrial Disability Retirement if he or she becomes *disabled* and has at least 5 years of credited service (total service across all CalPERS employers, and with certain other retirement systems with which CalPERS has reciprocity agreements). There is no special age requirement. *Disabled* means the member is unable to perform his or her job because of an illness or injury, which is expected to be permanent or to last indefinitely. The illness or injury does not have to be job related. A CalPERS member must be actively employed by any CalPERS employer at the time of disability in order to be eligible for this benefit.

Standard Benefit

The standard Non-Industrial Disability Retirement benefit is a monthly allowance equal to 1.8 percent of final compensation, multiplied by *service*, which is determined as follows:

- *Service* is CalPERS credited service, for members with less than 10 years of service or greater than 18.518 years of service; or

- *Service* is CalPERS credited service plus the additional number of years that the member would have worked until age 60, for members with at least 10 years but not more than 18.518 years of service. The maximum benefit in this case is 33 1/3 percent of final compensation.

Improved Benefit

Employers have the option of providing the improved Non-Industrial Disability Retirement benefit. This benefit provides a monthly allowance equal to 30 percent of final compensation for the first 5 years of service, plus 1 percent for each additional year of service to a maximum of 50 percent of final compensation.

Members who are eligible for a larger service retirement benefit may choose to receive that benefit in lieu of a disability benefit. Members eligible to retire, and who have attained the normal retirement age determined by their service retirement benefit formula, will receive the same dollar amount for disability retirement as that payable for service retirement. For members who have earned service with multiple CalPERS employers, the benefit attributed to each employer is the total disability allowance multiplied by the ratio of service with a particular employer to the total CalPERS service.

Industrial (Job Related) Disability Retirement

All safety members have this benefit. For miscellaneous members, employers have the option of providing this benefit. An employer may choose to provide the increased benefit option or the improved benefit option.

Eligibility

An employee is eligible for Industrial Disability Retirement if he or she becomes disabled while working, where disabled means the member is unable to perform the duties of the job because of a work-related illness or injury, which is expected to be permanent or to last indefinitely. A CalPERS member who has left active employment within this group is not eligible for this benefit, except to the extent described below.

Standard Benefit

The standard Industrial Disability Retirement benefit is a monthly allowance equal to 50 percent of final compensation.

Increased Benefit (75 percent of Final Compensation)

The increased Industrial Disability Retirement benefit is a monthly allowance equal to 75 percent final compensation for total disability.

Improved Benefit (50 percent to 90 percent of Final Compensation)

The improved Industrial Disability Retirement benefit is a monthly allowance equal to the Workman's Compensation Appeals Board permanent disability rate percentage (if 50 percent or greater, with a maximum of 90 percent) times the final compensation.

For a CalPERS member not actively employed in this group who became disabled while employed by some other CalPERS employer, the benefit is a return of accumulated member contributions with respect to employment in this group. With the standard or increased benefit, a member may also choose to receive the annuitization of the accumulated member contributions.

If a member is eligible for service retirement and if the service retirement benefit is more than the industrial disability retirement benefit, the member may choose to receive the larger benefit.

Post-Retirement Death Benefit

Standard Lump Sum Payment

Upon the death of a retiree, a one-time lump sum payment of $500 will be made to the retiree's designated survivor(s), or to the retiree's estate.

Improved Lump Sum Payment

Employers have the option of providing an improved lump sum death benefit of $600, $2,000, $3,000, $4,000 or $5,000.

Form of Payment for Retirement Allowance

Standard Form of Payment

Generally, the retirement allowance is paid to the retiree in the form of an annuity for as long as he or she is alive. The retiree may choose to provide for a portion of his or her allowance to be paid to any designated beneficiary after the retiree's death. CalPERS provides for a variety of such benefit options, which the retiree pays for by taking a reduction in his or her retirement allowance. Such reduction takes into account the amount to be provided to the beneficiary and the probable duration of payments (based on the ages of the member and beneficiary) made subsequent to the member's death.

Improved Form of Payment (Post-Retirement Survivor Allowance)

Employers have the option to contract for the post-retirement survivor allowance.

For retirement allowances with respect to service subject to the modified formula, 25 percent of the retirement allowance will automatically be continued to certain statutory beneficiaries upon the death of the retiree, without a reduction in the retiree's allowance. For retirement allowances with respect to service subject to the full or supplemental formula, 50 percent of the retirement allowance will automatically be continued to certain statutory beneficiaries upon the death of the retiree, without a reduction in the retiree's allowance. This additional benefit is referred to as post-retirement survivor allowance (PRSA) or simply as survivor continuance.

In other words, 25 percent or 50 percent of the allowance, the continuance portion, is paid to the retiree for as long as he or she is alive, and that same amount is continued to the retiree's spouse (or if no eligible spouse, to unmarried child(ren) until they attain age 18; or, if no eligible child(ren), to a qualifying dependent parent) for the rest of his or her lifetime. This benefit will not be discontinued in the event the spouse remarries.

The remaining 75 percent or 50 percent of the retirement allowance, which may be referred to as the option portion of the benefit, is paid to the retiree as an annuity for as long as he or she is alive. Or, the retiree may choose to provide for some of this option portion to be paid to any designated beneficiary after the retiree's death. Benefit options applicable to the option portion are the same as those offered with the standard form. The reduction is calculated in the same manner but is applied only to the option portion.

Pre-Retirement Death Benefits

Basic Death Benefit

This is a standard benefit.

Eligibility

An employee's beneficiary (or estate) may receive the basic death benefit if the member dies while actively employed. A CalPERS member must be actively employed with the CalPERS employer providing this benefit to be eligible for this benefit. A member's survivor who is eligible for any other pre-retirement death benefit may choose to receive that death benefit instead of this basic death benefit.

Benefit

The basic death benefit is a lump sum in the amount of the member's accumulated contributions, where interest is currently credited at 7.5 percent per year, plus a lump sum in the amount of one month's salary for each completed year of current service, up to a maximum of six months' salary. For purposes of this benefit, one month's salary is defined as the member's average monthly full-time rate of compensation during the 12 months preceding death.

1957 Survivor Benefit

This is a standard benefit.

Eligibility

An employee's *eligible survivor(s)* may receive the 1957 Survivor benefit if the member dies while actively employed, has attained at least age 50 for classic and safety PEPRA members and age 52 for miscellaneous PEPRA members, and has at least 5 years of credited service (total service across all CalPERS employers and with certain other retirement systems with which CalPERS has reciprocity agreements). A CalPERS member must be actively employed with the CalPERS employer providing this benefit to be eligible for this benefit. An eligible survivor means the surviving spouse to whom the member was married at least one year before death or, if there is no eligible spouse, to the member's unmarried child(ren) under age 18. A member's survivor who is eligible for any other pre-retirement death benefit may choose to receive that death benefit instead of this 1957 Survivor benefit.

Benefit

The 1957 Survivor benefit is a monthly allowance equal to one-half of the unmodified service retirement benefit that the member would have been entitled to receive if the member had retired on the date of his or her death. If the benefit is payable to the spouse, the benefit is discontinued upon the death of the spouse. If the benefit is payable to dependent child(ren), the benefit will be discontinued upon death or attainment of age 18, unless the child(ren) is disabled. The total amount paid will be at least equal to the basic death benefit.

Optional Settlement 2W Death Benefit

This is an optional benefit.

Eligibility

An employee's *eligible survivor* may receive the Optional Settlement 2W Death benefit if the member dies while actively employed, has attained at least age 50 for classic and safety PEPRA members and age 52 for miscellaneous PEPRA members, and has at least 5 years of credited service (total service across all CalPERS employers and with certain other retirement systems with which CalPERS has reciprocity agreements). A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married at least one year before death. A member's survivor who is eligible for any other pre-retirement death benefit may choose to receive that death benefit instead of this Optional Settlement 2W Death benefit.

Benefit

The Optional Settlement 2W Death benefit is a monthly allowance equal to the service retirement benefit that the member would have received had the member retired on the date of his or her death and elected Optional Settlement 2W. (A retiree who elects Optional Settlement 2W receives an allowance that has been reduced so that it will continue to be paid after his or her death to a surviving beneficiary.) The allowance is payable as long as the surviving spouse lives, at which time it is continued to any unmarried child(ren) under age 18, if applicable. The total amount paid will be at least equal to the basic death benefit.

Special Death Benefit

This is a standard benefit for safety members. An employer may elect to provide this benefit for miscellaneous members.

Eligibility

An employee's *eligible survivor(s)* may receive the special death benefit if the member dies while actively employed and the death is job-related. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married prior to the onset of the injury or illness that resulted in death. If there is no eligible spouse, an eligible survivor means the member's unmarried child(ren) under age 22. An eligible survivor who chooses to receive this benefit will not receive any other death benefit.

Benefit

The special death benefit is a monthly allowance equal to 50 percent of final compensation, and will be increased whenever the compensation paid to active employees is increased but ceasing to increase when the member would have attained age 50. The allowance is payable to the surviving spouse until death at which time the allowance is continued to any unmarried child(ren) under age 22. There is a guarantee that the total amount paid will at least equal the basic death benefit.

If the member's death is the result of an accident or injury caused by external violence or physical force incurred in the performance of the member's duty, and there are *eligible* surviving child(ren) (*eligible* means unmarried child(ren) under age 22) in addition to an eligible spouse, then an **additional monthly allowance** is paid equal to the following:

- if 1 eligible child: 12.5 percent of final compensation
- if 2 eligible children: 20.0 percent of final compensation
- if 3 or more eligible children: 25.0 percent of final compensation

Alternate Death Benefit for Local Fire Members

This is an optional benefit available only to local fire members.

Eligibility

An employee's *eligible survivor(s)* may receive the alternate death benefit in lieu of the basic death benefit or the 1957 Survivor benefit if the member dies while actively employed and has at least 20 years of total CalPERS service. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married prior to the onset of the injury or illness that resulted in death. If there is no eligible spouse, an eligible survivor means the member's unmarried child(ren) under age 18.

Benefit

The Alternate Death benefit is a monthly allowance equal to the service retirement benefit that the member would have received had the member retired on the date of his or her death and elected Optional Settlement 2W. (A retiree who elects Optional Settlement 2W receives an allowance that has been reduced so that it will continue to be paid after his or her death to a surviving beneficiary.) If the member has not yet attained age 50, the benefit is equal to that which would be payable if the member had retired at age 50, based on service credited at the time of death. The allowance is payable as long as the surviving spouse lives, at which time it is continued to any unmarried child(ren) under age 18, if applicable. The total amount paid will be at least equal to the basic death benefit.

Cost-of-Living Adjustments (COLA)

Standard Benefit

Retirement and survivor allowances are adjusted each year in May for cost of living, beginning the second calendar year after the year of retirement. The standard cost-of-living adjustment (COLA) is 2 percent. Annual adjustments are calculated by first determining the lesser of 1) 2 percent compounded from the end of the year of retirement or 2) actual rate of inflation. The resulting increase is divided by the total increase provided in prior years. For any particular year, the COLA adjustment may be less than 2 percent (when the rate of inflation is low), may be greater than the rate of inflation (when the rate of inflation is low after several years of high inflation) or may even be greater than 2 percent (when inflation is high after several years of low inflation).

Improved Benefit

Employers have the option of providing a COLA of 3 percent, 4 percent, or 5 percent, determined in the same manner as described above for the standard 2 percent COLA. An improved COLA is not available with the 1.5% at 65 formula.

Purchasing Power Protection Allowance (PPPA)

Retirement and survivor allowances are protected against inflation by PPPA. PPPA benefits are cost-of-living adjustments that are intended to maintain an individual's allowance at 80 percent of the initial allowance at retirement adjusted for inflation since retirement. The PPPA benefit will be coordinated with other cost-of-living adjustments provided under the plan.

Employee Contributions

Each employee contributes toward his or her retirement based upon the retirement formula. The standard employee contribution is as described below.

- The percent contributed below the monthly compensation breakpoint is 0 percent.
- The monthly compensation breakpoint is $0 for full and supplemental formula members and $133.33 for employees covered by the modified formula.
- The percent contributed above the monthly compensation breakpoint depends upon the benefit formula, as shown in the table below.

Benefit Formula	Percent Contributed above the Breakpoint
Miscellaneous, 1.5% at 65	2%
Miscellaneous, 2% at 60	7%
Miscellaneous, 2% at 55	7%
Miscellaneous, 2.5% at 55	8%
Miscellaneous, 2.7% at 55	8%
Miscellaneous, 3% at 60	8%
Miscellaneous, 2% at 62	50% of the Total Normal Cost
Miscellaneous, 1.5% at 65	50% of the Total Normal Cost
Safety, 1/2 at 55	Varies by entry age
Safety, 2% at 55	7%
Safety, 2% at 50	9%
Safety, 3% at 55	9%
Safety, 3% at 50	9%
Safety, 2% at 57	50% of the Total Normal Cost
Safety, 2.5% at 57	50% of the Total Normal Cost
Safety, 2.7% at 57	50% of the Total Normal Cost

The employer may choose to "pick-up" these contributions for classic members (Employer Paid Member Contributions or EPMC). EPMC is prohibited for new PEPRA members.

An employer may also include Employee Cost Sharing in the contract, where employees agree to share the cost of the employer contribution. These contributions are paid in addition to the member contribution.

Auxiliary organizations of the CSUC system may elect reduced contribution rates, in which case the offset is $317 and the contribution rate is 6 percent if members are not covered by Social Security. If members are covered by Social Security, the offset is $513 and the contribution rate is 5 percent.

Refund of Employee Contributions

If the member's service with the employer ends, and if the member does not satisfy the eligibility conditions for any of the retirement benefits above, the member may elect to receive a refund of his or her employee contributions, which are credited with 6 percent interest compounded annually.

1959 Survivor Benefit

This is a pre-retirement death benefit available only to members not covered by Social Security. Any agency joining CalPERS subsequent to 1993 is required to provide this benefit if the members are not covered by Social Security. The benefit is optional for agencies joining CalPERS prior to 1994. Levels 1, 2 and 3 are now closed. Any new agency or any agency wishing to add this benefit or increase the current level may only choose the 4th or Indexed Level.

This benefit is not included in the results presented in this valuation. More information on this benefit is available on the CalPERS website at www.calpers.ca.gov.

APPENDIX C

PARTICIPANT DATA

- **SUMMARY OF VALUATION DATA**
- **ACTIVE MEMBERS**
- **TRANSFERRED AND TERMINATED MEMBERS**
- **RETIRED MEMBERS AND BENEFICIARIES**

Summary of Valuation Data

	June 30, 2014	June 30, 2015
1. **Active Members**		
a) Counts	129	134
b) Average Attained Age	47.67	47.33
c) Average Entry Age to Rate Plan	35.05	35.58
d) Average Years of Service	12.62	11.75
e) Average Annual Covered Pay	$ 107,299	$ 108,178
f) Annual Covered Payroll	13,841,577	14,495,883
g) Projected Annual Payroll for Contribution Year	15,125,065	15,840,043
h) Present Value of Future Payroll	100,990,539	109,608,724
2. **Transferred Members**		
a) Counts	37	37
b) Average Attained Age	50.59	50.14
c) Average Years of Service	5.29	5.36
d) Average Annual Covered Pay	$ 103,097	$ 106,919
3. **Terminated Members**		
a) Counts	30	29
b) Average Attained Age	43.99	45.07
c) Average Years of Service	3.31	3.32
d) Average Annual Covered Pay	$ 63,857	$ 61,441
4. **Retired Members and Beneficiaries**		
a) Counts	155	162
b) Average Attained Age	68.14	68.33
c) Average Annual Benefits	$ 32,603	$ 35,466
5. **Active to Retired Ratio** [(1a) / (4a)]	0.83	0.83

Counts of members included in the valuation are counts of the records processed by the valuation. Multiple records may exist for those who have service in more than one valuation group. This does not result in double counting of liabilities.

Average Annual Benefits represents benefit amounts payable by this plan only. Some members may have service with another agency and would therefore have a larger total benefit than would be included as part of the average shown here.

Active Members

Counts of members included in the valuation are counts of the records processed by the valuation. Multiple records may exist for those who have service in more than one valuation group. This does not result in double counting of liabilities.

Distribution of Active Members by Age and Service

	Years of Service at Valuation Date						
Attained Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-25**	**25+**	**Total**
15-24	2	0	0	0	0	0	2
25-29	4	0	0	0	0	0	4
30-34	10	4	1	0	0	0	15
35-39	6	7	6	0	0	0	19
40-44	3	5	2	1	0	1	12
45-49	10	8	4	2	3	0	27
50-54	2	2	5	6	3	5	23
55-59	1	1	2	3	4	4	15
60-64	1	3	1	0	0	2	7
65 and over	0	1	2	2	3	2	10
All Ages	**39**	**31**	**23**	**14**	**13**	**14**	**134**

Distribution of Average Annual Salaries by Age and Service

	Years of Service at Valuation Date						
Attained Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-25**	**25+**	**Average**
15-24	$44,596	$0	$0	$0	$0	$0	$44,596
25-29	78,029	0	0	0	0	0	78,029
30-34	93,380	96,450	100,895	0	0	0	94,700
35-39	87,721	107,592	122,254	0	0	0	105,947
40-44	153,221	111,960	100,569	123,116	0	195,887	128,300
45-49	91,496	94,789	106,091	130,823	169,212	0	106,182
50-54	121,085	106,870	113,774	115,805	141,922	107,267	116,596
55-59	114,741	91,233	134,189	100,516	103,515	140,280	116,739
60-64	104,115	139,870	102,181	0	0	97,319	117,220
65 and over	0	116,822	113,472	90,561	68,041	136,104	100,122
All Ages	**$94,797**	**$106,402**	**$114,187**	**$111,590**	**$119,353**	**$125,728**	**$108,178**

Transferred and Terminated Members

Distribution of Transfers to Other CalPERS Plans by Age and Service

Attained Age	Years of Service at Valuation Date 0-4	5-9	10-14	15-19	20-25	25+	Total	Average Salary
15-24	0	0	0	0	0	0	0	$0
25-29	0	0	0	0	0	0	0	0
30-34	1	0	0	0	0	0	1	100,134
35-39	2	1	0	0	0	0	3	104,773
40-44	3	1	0	0	0	0	4	88,362
45-49	6	2	0	0	0	0	8	107,110
50-54	5	3	1	0	0	1	10	114,386
55-59	2	6	1	1	0	0	10	106,912
60-64	0	0	0	0	0	0	0	0
65 and over	1	0	0	0	0	0	1	118,231
All Ages	**20**	**13**	**2**	**1**	**0**	**1**	**37**	**106,919**

Distribution of Terminated Participants with Funds on Deposit by Age and Service

Attained Age	Years of Service at Valuation Date 0-4	5-9	10-14	15-19	20-25	25+	Total	Average Salary
15-24	0	0	0	0	0	0	0	$0
25-29	1	0	0	0	0	0	1	42,482
30-34	3	1	0	0	0	0	4	72,839
35-39	5	1	0	0	0	0	6	64,468
40-44	4	0	0	0	0	0	4	54,229
45-49	1	1	1	0	0	0	3	60,805
50-54	5	1	0	1	1	0	8	61,115
55-59	2	0	0	0	0	0	2	43,462
60-64	1	0	0	0	0	0	1	85,967
65 and over	0	0	0	0	0	0	0	0
All Ages	**22**	**4**	**1**	**1**	**1**	**0**	**29**	**61,441**

Retired Members and Beneficiaries

Distribution of Retirees and Beneficiaries by Age and Retirement Type*

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	0	0	0	0	0	0	0
30-34	0	0	0	0	0	0	0
35-39	0	0	0	0	0	0	0
40-44	0	0	0	0	0	0	0
45-49	0	1	0	0	0	0	1
50-54	3	0	0	0	0	0	3
55-59	21	2	0	0	0	2	25
60-64	33	1	0	0	0	2	36
65-69	34	2	0	0	0	1	37
70-74	19	0	0	0	0	2	21
75-79	14	2	0	0	0	2	18
80-84	9	2	0	0	0	3	14
85 and Over	4	1	0	0	0	2	7
All Ages	**137**	**11**	**0**	**0**	**0**	**14**	**162**

Distribution of Average Annual Amounts for Retirees and Beneficiaries by Age and Retirement Type*

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Average
Under 30	$0	$0	$0	$0	$0	$0	$0
30-34	0	0	0	0	0	0	0
35-39	0	0	0	0	0	0	0
40-44	0	0	0	0	0	0	0
45-49	0	22,127	0	0	0	0	22,127
50-54	56,381	0	0	0	0	0	56,381
55-59	28,558	16,536	0	0	0	12,265	26,293
60-64	36,140	26,052	0	0	0	9,049	34,355
65-69	40,981	25,109	0	0	0	119,911	42,256
70-74	48,119	0	0	0	0	27,853	46,189
75-79	36,100	14,012	0	0	0	48,817	35,059
80-84	27,385	4,889	0	0	0	29,900	24,710
85 and Over	28,694	17,052	0	0	0	8,911	21,379
All Ages	**$37,487**	**$16,938**	**$0**	**$0**	**$0**	**$30,243**	**$35,466**

Retired Members and Beneficiaries (continued)

Distribution of Retirees and Beneficiaries by Years Retired and Retirement Type*

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Yrs	45	0	0	0	0	6	51
5-9	30	1	0	0	0	6	37
10-14	32	0	0	0	0	0	32
15-19	17	4	0	0	0	1	22
20-24	5	2	0	0	0	1	8
25-29	5	1	0	0	0	0	6
30 and Over	3	3	0	0	0	0	6
All Years	**137**	**11**	**0**	**0**	**0**	**14**	**162**

Distribution of Average Annual Amounts for Retirees and Beneficiaries by Years Retired and Retirement Type*

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Average
Under 5 Yrs	$39,405	$0	$0	$0	$0	$34,435	$38,820
5-9	42,469	22,127	0	0	0	24,701	39,038
10-14	36,616	0	0	0	0	0	36,616
15-19	36,276	19,351	0	0	0	36,941	33,229
20-24	33,488	26,020	0	0	0	31,641	31,390
25-29	17,926	7,921	0	0	0	0	16,259
30 and Over	14,336	8,943	0	0	0	0	11,639
All Years	**$37,487**	**$16,938**	**$0**	**$0**	**$0**	**$30,243**	**$35,466**

* Counts of members do not include alternate payees receiving benefits while the member is still working. Therefore, the total counts may not match information on page 25 of the report. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

APPENDIX D

DEVELOPMENT OF PEPRA MEMBER CONTRIBUTION RATES

Development of PEPRA Members Contribution Rates

The table below shows the determination of the Member contribution rates based on 50 percent of the Total Normal Cost for each respective plan on June 30, 2015.

Assembly Bill (AB) 340 created PEPRA that implemented new benefit formulas and a final compensation period as well as new contribution requirements for new employees. In accordance with Section Code 7522.30(b), "new members ... shall have an initial contribution rate of at least 50 percent of the normal cost rate." The normal cost for the plan is dependent on the benefit levels, actuarial assumptions and demographics of the plan particularly the entry age into the plan. The PEPRA total normal cost for the plan is calculated assuming the entire active population, including classic members, is subject to the adopted PEPRA formula and applicable compensation limits. Should the total normal cost of the plan change by one percent or more from the base total normal cost established for the plan, the new member rate shall be 50% of the new normal cost rounded up to the next highest quarter percent.

		Basis for Current Rate		Rates Effective July 1, 2017			
Rate Plan Identifier	**Plan**	**Total Normal Cost**	**Member Rate**	**Total Normal Cost**	**Change**	**Change Needed**	**Member Rate**
26482	Miscellaneous PEPRA	12.500%	6.250%	11.835%	(0.665%)	No	6.250%

APPENDIX E

GLOSSARY OF ACTUARIAL TERMS

Glossary of Actuarial Terms

Accrued Liability *(also called Actuarial Accrued Liability or Entry Age Normal Accrued Liability)*
The total dollars needed as of the valuation date to fund all benefits earned in the past for *current* members.

Actuarial Assumptions
Assumptions made about certain events that will affect pension costs. Assumptions generally can be broken down into two categories: demographic and economic. Demographic assumptions include such things as mortality, disability and retirement rates. Economic assumptions include discount rate, salary growth and inflation.

Actuarial Methods
Procedures employed by actuaries to achieve certain funding goals of a pension plan. Actuarial methods include funding method, setting the length of time to fund the Accrued Liability and determining the Value of Assets.

Actuarial Valuation
The determination, as of a valuation date of the Normal Cost, Accrued liability, and related actuarial present values for a pension plan. These valuations are performed annually or when an employer is contemplating a change to their plan provisions.

Amortization Bases
Separate payment schedules for different portions of the Unfunded Liability. The total Unfunded Liability of a Risk Pool or non-pooled plan can be segregated by "cause," creating "bases" and each such base will be separately amortized and paid for over a specific period of time. However, all bases are amortized using investment and payroll assumptions from the current valuation. This can be likened to a home having a first mortgage of 24 years remaining payments and a second mortgage that has 10 years remaining payments. Each base or each mortgage note has its own terms (payment period, principal, etc.)

Generally, in an actuarial valuation, the separate bases consist of changes in unfunded liability due to contract amendments, actuarial assumption changes, actuarial methodology changes, and/or gains and losses. Payment periods are determined by Board policy and vary based on the cause of the change.

Amortization Period
The number of years required to pay off an Amortization Base.

Classic Member (under PEPRA)
A classic member is a member who joined CalPERS prior to January, 1, 2013 and who is not defined as a new member under PEPRA. (See definition of new member below)

Discount Rate Assumption
The actuarial assumption that was called "investment return" in earlier CalPERS reports or "actuarial interest rate" in Section 20014 of the California Public Employees' Retirement Law (PERL).

Entry Age
The earliest age at which a plan member begins to accrue benefits under a defined benefit pension plan. In most cases, this is the age of the member on their date of hire.

Entry Age Normal Cost Method
An actuarial cost method designed to fund a member's total plan benefit over the course of his or her career. This method is designed to yield a rate expressed as a level percentage of payroll.
(The assumed retirement age less the entry age is the amount of time required to fund a member's total benefit. Generally, the older a member on the date of hire, the greater the entry age normal cost. This is mainly because there is less time to earn investment income to fund the future benefits.)

Fresh Start
A Fresh Start is when multiple amortization bases are collapsed to one base and amortized together over a new funding period.

Funded Status
A measure of how well funded, or how "on track" a plan or risk pool is with respect to assets versus accrued liabilities. A ratio greater than 100% means the plan or risk pool has more assets than liabilities and a ratio less than 100% means liabilities are greater than assets.

GASB 68
Statement No. 68 of the Governmental Accounting Standards Board. The accounting standard governing a state or local governmental employer's accounting and financial reporting for pensions. GASB 68 replaces GASB 27 effective the first fiscal year beginning after June 15, 2014.

New Member (under PEPRA)
A new member includes an individual who becomes a member of a public retirement system for the first time on or after January 1, 2013, and who was not a member of another public retirement system prior to that date, and who is not subject to reciprocity with another public retirement system.

Normal Cost
The annual cost of service accrual for the upcoming fiscal year for active employees. The normal cost should be viewed as the long term contribution rate.

Pension Actuary
A business professional that is authorized by the Society of Actuaries, and the American Academy of Actuaries to perform the calculations necessary to properly fund a pension plan.

PEPRA
The California Public Employees' Pension Reform Act of 2013

Prepayment Contribution
A payment made by the employer to reduce or eliminate the year's required employer contribution.

Present Value of Benefits (PVB)
The total dollars needed as of the valuation date to fund all benefits earned in the past or expected to be earned in the future for *current* members.

Superfunded
A condition existing when a plan's Actuarial Value of Assets exceeds its Present Value of Benefits. Prior to the passage of PEPRA, when this condition existed on a given valuation date for a given plan, employee contributions for the rate year covered by that valuation could be waived.

Unfunded Liability (UAL)
When a plan or pool's Value of Assets is less than its Accrued Liability, the difference is the plan or pool's Unfunded Liability. If the Unfunded Liability is positive, the plan or pool will have to pay contributions exceeding the Normal Cost.

CalPERS

Actuarial
Circular Letter

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January 19, 2017

Circular Letter: 200-004-17
Distribution: VI

To: **All Public Agency Employers**

Subject: **Discount Rate Change**

The purpose of this Circular Letter is to inform you of recent changes to the CalPERS discount rate assumption and the impact these changes are expected to have on required employer and PEPRA member contributions. This Circular Letter will assist you in calculating projected pension cost increases in future years. The June 30, 2016, annual valuations will provide updated projections of expected future year pension contributions. These reports will be available this summer.

At the December 21, 2016, meeting, the CalPERS Board of Administration approved lowering the CalPERS discount rate assumption, the long-term rate of return, from 7.50 percent to 7.00 percent over the next three years. This will increase public agency employer contribution costs beginning in Fiscal Year 2018-19.

The phase-in of the discount rate change approved by the Board for the next three Fiscal Years is as follows:

Valuation Date	Fiscal Year for Required Contribution	Discount Rate
June 30, 2016	2018-19	7.375%
June 30, 2017	2019-20	7.25%
June 30, 2018	2020-21	7.00%

Lowering the discount rate means plans will see increases in both the normal costs (the cost of pension benefits accruing in one year for active members) and the accrued liabilities. These increases will result in higher required employer contributions.

In addition, active members hired after January 1, 2013, under the Public Employees' Pension Reform Act (PEPRA) may also see their contribution rates rise.

The benefits of reducing the discount rate include:

- Strengthening long-term sustainability of the fund
- Reducing negative cash flows; additional contributions will help to offset the cost to pay pensions
- Reducing the long-term probability of funded ratios falling below undesirable levels
- Improving the likelihood of CalPERS investments earning our assumed rate of return
- Reducing the risk of contribution increases in the future from volatile investment markets

Results

Employer contribution increases as a result of the discount rate changes are estimated below by Normal Cost and required Unfunded Accrued Liability (UAL) payment. The Total Employer Contribution is the sum of the Normal Cost Rate applied to reported payroll plus the Unfunded Accrued Liability payment. The Normal Cost portion of the Employer Contribution is expected to increase by the listed percentages of payroll. Increases to the UAL payments are provided as relative increases to be applied to the projected UAL payments in the June 30, 2015, valuation report.

		Normal Cost		UAL Payments	
Valuation Date	Fiscal Year Impact	Misc. Plans	Safety Plans	Misc. Plans	Safety Plans
6/30/2016	2018-19	0.25% - 0.75%	0.5% - 1.25%	2% - 3%	2% - 3%
6/30/2017	2019-20	0.5% - 1.5%	1.0% - 2.5%	4% - 6%	4% - 6%
6/30/2018	2020-21	1.0% - 3.0%	2.0% - 5.0%	10% - 15%	10% - 15%
6/30/2019	2021-22	1.0% - 3.0%	2.0% - 5.0%	15% - 20%	15% - 20%
6/30/2020	2022-23	1.0% - 3.0%	2.0% - 5.0%	20% - 25%	20% - 25%
6/30/2021	2023-24	1.0% - 3.0%	2.0% - 5.0%	25% - 30%	25% - 30%
6/30/2022	2024-25	1.0% - 3.0%	2.0% - 5.0%	30% - 40%	30% - 40%

The changes to the Unfunded Accrued Liability (UAL) due to changes of actuarial assumptions are amortized over a fixed 20-year period with a 5-year ramp up at the beginning and a 5-year ramp down at the end of the amortization period. The 5-year ramp up means that the payments in the first four years of the amortization schedule are 20 percent, 40 percent, 60 percent and 80 percent of the ultimate payment, which begins in year five. The 5-year ramp down means that the reverse is true and the payments in the final four years are ramped down by the above percentages. A new ramp is established with each change to the discount rate. There will be three ramps established in the first three years. As a result of the 5-year ramp up and effective date of the increase, it will be seven years until the full impact of the discount rate change is completely phased in. The shaded rows above are the expected increases beyond the five year projection quoted in your June 30, 2015, valuation report.

To illustrate how this table can be used as a guide to include the change in the discount rate in the calculation of pension contributions, a Miscellaneous plan with a current normal cost of 15 percent of payroll can expect an increase to 15.25 percent to 15.75 percent of payroll in the first year (Fiscal Year 2018-19), and 16 percent to 18 percent in the fifth year (Fiscal Year 2022-23). For the UAL payment, a plan with a projected payment of $500,000 in Fiscal Year 2018-19 and $600,000 in Fiscal Year 2022-23 can expect the revised payment to be $510,000 - $515,000 ($500,000x2.00%/$500,000x3.00%) for Fiscal Year 2018-19, and $720,000 - $750,000 ($600,000x20%/$600,000x25%) for Fiscal Year 2022-23. These estimated increases incorporate both the impact of the discount rate change and the ramp up.

Please keep in mind the above table is a tool for you to calculate broad estimates and should only be used as a general guide. The annual valuation report that will be released this summer will provide updated projections for your specific plan.

If you have any questions about the information provided or how to apply it to your current valuations, please call our CalPERS Customer Contact Center at **888 CalPERS** (or **888**-225-7377) and ask to have your plan actuary contact you.

Scott Terando
Chief Actuary

UNION SANITARY DISTRICT

Summary of the EBDA Commission Meeting
Thursday, February 16, 2017, at 9:30 a.m.
Prepared by: P. Eldredge

- Commissioners Becker, Peixoto, Johnson, Cutter, and Toy were present.

- The Consent Calendar was approved unanimously and included the Commission Meeting Minutes, List of Disbursements, and Treasurer's Report.

- The Commission unanimously approved the reports from the Financial Management, Regulatory Affairs, Operations & Maintenance, and Ad Hoc committees. The following items were discussed:

- **General Managers Report -** The General Manager deferred comments to specific agenda items.

- **Managers Advisory Committee (MAC)** – met with the General Manager on February 15, 2017. The MAC discussed the Strategic Plan Workshop. The Managers reviewed the administrative draft of the NPDES permit and provided comments for the Water Board.

- **Financial Management Committee** met with the General Manager on February 14, 2017 and approved the January list of disbursements and Treasurer's Reports. The Committee reviewed second quarter expenses for fiscal year 2016/17 and noted expenses are under budget by about $104K (9%), which is mostly due to lower permit fees. Although mid-year expenses are under budget, spending by year-end may exceed budget projections due to the hiring of a replacement O&M Manager.

  Eric Casher, the Authority's Legal Counsel, advised the Commission that each of the agencies that Meyers Nave represents will be asked to sign a Conflict Waiver. Meyers Nave will create an ethical wall within the firm to keep attorneys representing a member agency from communicating about the EBDA JPA amendment. Should a litigation issue arise, and at any point, EBDA and each member agency respectively could hire independent counsel outside of Meyers Nave for any issues related to the JPA amendment. The Commission approved Meyers Nave's request for the General Manager to sign a Conflict Waiver regarding the Fourth Amended Joint Exercise of Powers Agreement.

  The Commission reviewed rate assumptions for the FY 2017/18 budget. The Commission discussed a staff recommendation to increase the Renewal and Replacement Fund budget from $450,000 to $500,000. The Commission requested staff research additional funding options that would keep the RRF annual assessment at $450,000.

- **Regulatory Affairs Committee** met with the General Manager on February 14, 2017. The Committee discussed permit compliance and reviewed the NPDES annual report. The Committee recommended the Commission authorize Amendment No. 1 to the EOA, Inc. agreement in the amount of $10,000 for assistance in developing comments for the draft NPDES permit.

- **Operations and Maintenance (O&M) Committee** met with the General Manager on February 13, 2017 and discussed the status of EBDA facilities. The Committee was updated on the status of the AEPS No. 1 Effluent Pump, Hayward MCC replacement project, and OLEPS fuel tank replacement. The Superintendent of O&M advised the Committee that the Skywest pump station No. 1 distribution pump was inspected by the OLSD maintenance department. The distribution pump was found to have damage with an estimated repair cost of $10,000.

  The Committee discussed the renewal of a memorandum of understanding between EBDA and the City of Hayward for use of the Hayward Ponds. The Committee expressed its support for Commission approval of a resolution authorizing the renewal of the memorandum of understanding with the City of Hayward for the use of the Hayward Ponds for emergency overflow.

- **Ad Hoc Committee -** The Ad Hoc Committee met with the General Manager on February 15, 2017. Michele Tamayo of Tamayo Group, Inc. joined the Committee via telephone to review her report on EBDA's strategic plan workshop that took place on January 25, 2017. Several key issues that were identified are: the length of term of the agreement, an escape clause for agencies to exit the agreement and spending cap on capital expenses in the transport system, as well as different models for appropriating costs among the member agencies. To continue the process the Consultant recommends that the MAC meet to discuss the results of the workshop and provide specific options for the Commission to consider.

  The Commission asked the Authority's legal counsel to discuss the process by which termination of the EBDA JPA might occur if it is not renewed in January 2020 and the impact on the member agencies. Counsel advised that the EBDA JPA and government code are silent on the issue of a member agency having to fund EBDA if it has no flow entering the EBDA system. Two options were discussed: 1) have the member agencies negotiate the JPA agreement and find consensus on this issue, or 2) litigate the issue to allow the courts to decide. The Commission requested the MAC discuss the key points identified during the Strategic Plan workshop and propose specific language for the JPA renewal.

- **Closed Session** - The Commission met in closed session pursuant to Government Code Section 54956(d)(2) to discuss anticipated litigation. After reconvening to open session, it was announced that the reportable action taken in closed session was to notify the IRS of payroll adjustment issue.

- **Items from the Commission and Staff** - The Commission welcomed Pauline Russo Cutter to the EBDA Commission.

- **Resolution Authorizing the General Manager to Issue Amendment No. 1 to the Eisenberg, Olivieri, and Associates, Inc. Agreement for Additional Professional Services Associated with the NPDES Permit Renewal in the Amount of $10,000**

  Commissioner Peixoto introduced the resolution authorizing Amendment No. 1 to the EOA, Inc. agreement for services associated with NPDES permit renewal in the amount of $10,000. The motion was seconded by Commissioner Becker and carried unanimously, 5-0.

  Ayes: Commissioners Becker, Peixoto, Cutter, Toy, and Chair Johnson
  Noes: None
  Absent: None
  Abstain: None

- **Resolution Authorizing the General Manager to Execute a Memorandum of Understanding Between East Bay Dischargers Authority and the City of Hayward for Use of the Hayward Ponds**

  Commissioner Peixoto introduced the resolution authorizing the renewal of a MOU between EBDA and the City of Hayward for the use of the Hayward Ponds for emergency overflow. The motion was seconded by Commissioner Toy and carried unanimously, 5-0.

  Ayes: Commissioners Becker, Peixoto, Cutter, Toy, and Chair Johnson
  Noes: None
  Absent: None
  Abstain: None

SFGATE

Despite deluge, California water regulations aren’t going anywhere

By Michael Bodley, San Francisco Chronicle

Updated 6:04 pm, Wednesday, February 8, 2017

Despite weeks of rain and a growing perception that the California drought is dead or dying, state officials Wednesday largely extended the water regulations that have become the new normal in cities and towns throughout the state.

The rainy season that began in October is still far from over, and little is guaranteed when it comes to weather, regulators argued, adding that the Sierra snowpack that has built up to 154 percent of normal could melt quickly come warmer weather.

The regulations impose conservation on urban suppliers and threaten fines for noncompliance. Among other rules, watering lawns within 48 hours after rainfall is prohibited. Restaurants, meanwhile, are required to ask diners if they’d like a glass of water before serving it.

In an hours-long meeting of the State Water Resources Control Board, dozens of people opposed to the regulations said they had become unnecessary and damaging to public trust, given all the rain that’s fallen. But the board was unanimous.

It’s a “steady as she goes approach,” said Max Gomberg, the climate and conservation manager for the board. Steven Moore, a board member, said that “the drought could be over, but the need to conserve water is not.”

“I believe allowing the regulation to expire is like making an airplane landing without deploying the landing gear,” Moore said. “We’ll survive, but how will the airplane look?” The rules, which had been set to expire at the end of February, were extended for up to 270 days, but the board plans to revisit the matter in May, a spokesman said.

Felicia Marcus, the water board’s chair, made it clear that her agency has been “watching the weather,” adding that the “excellent” spate of recent rain — including California’s seventh-wettest January on record, according to the National Weather Service — has been promising.

But she pointed out that many groundwater reserves are not back to normal.
“It’s an interesting picture,” Marcus said. “It’s a promising picture, and I guess my main point is that reasonable minds actually can and do differ on what we should do next.”

Many of California’s reservoirs have filled, leading water suppliers to call on Gov. Jerry Brown to lift his emergency declaration of drought. If Brown lifts the declaration, the restrictions would no longer apply.

Nancy Vogel, a spokeswoman for the California Natural Resources Agency, which monitors drought, noted that one of the state’s largest reservoirs, Lake Cachuma in Santa Barbara County, was at 13 percent capacity.

“Although this year may end up being wet ... we can’t say whether it’s just going to be one wet year in another string of dry ones,” Vogel said.

According to the latest U.S. Drought Monitor figures released Feb. 2, about 39 percent of California was without any drought status, compared with 0 percent last year.

About half the state, though, remained in at least “moderate drought,” with 20 percent in “severe drought” and nearly 2 percent in “extreme drought.”

State Sen. Jim Nielsen, R-Gerber (Tehama County), an outspoken opponent of the drought regulations, called the measures “draconian.”

Michael Bodley is a San Francisco Chronicle staff writer.
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The Press Democrat

Winter storms send sewage overflows into Russian River, Sonoma Valley creeks

DEREK MOORE
THE PRESS DEMOCRAT | February 9, 2017

Heavy downpours in the North Bay this winter have once again triggered significant sewage overflows into creeks and rivers, including an estimated 200,000 gallons of untreated wastewater that flowed this week into Sonoma Valley tributaries feeding San Pablo Bay, according to water officials.

Wastewater also overflowed into the Russian River this week at Guernewood Park, near Vacation Beach, where the Russian River County Sanitation District operates a lift or pumping station.

Brad Sherwood, a spokesman for the Sonoma County Water Agency, said Thursday the agency is still determining how much wastewater made its way into the river.

“Most likely it’s a drop in the bucket compared to the flow in the river today,” he said. During large storms, it’s not uncommon for water to penetrate cracked sewer lines, sending a fetid brew of untreated wastewater up through manholes.

Aging pipes also have been known to break entirely, as was the case in February 2014, when a 16-inch steel pipe burst in a rural neighborhood outside Guerneville, spilling an estimated 100,000 gallons of raw sewage into the river.

That spill — the largest along the river in a decade — and frequent sewage overflows during major storms cast light on the precarious state of miles of underground wastewater pipes.

Water management officials say they are working to address the problem. That includes, in the Russian River County Sanitation District, rebuilding a pump station every year over the next decade, according to Sherwood.

He said the district, which serves about 3,200 accounts, is “by far” the most complicated collection system pipeline network in the county, requiring 11 separate pumping stations to transfer wastewater from homes and businesses to a treatment plant.

“These stations require constant maintenance and frequent pump rebuilds, and periodically their high-voltage electrical systems must be completely replaced,” Sherwood said.

Sonoma County Supervisor Susan Gorin, a water agency director, said people need to acknowledge that this year has been an extraordinary one in terms of rainfall.

“That makes it very, very difficult for any water treatment plant to keep up,” Gorin said. “This challenge is not unique to Sonoma Valley. It occurs in Santa Rosa and just about every city and county because the infrastructure is old and getting older.”

Besides generating public health concerns, sewage overflows can result in hefty fines for water management agencies.

The Sonoma Valley County Sanitation District was slapped with a $732,000 fine last year following a series of sewage overflows in 2010 and 2014.

The amount of the 2014 overflows was estimated to be 145,860 gallons —– roughly 45,000 gallons less than what is believed to have occurred in Sonoma Valley this week. This week’s totals didn’t include two additional overflows that occurred Thursday afternoon on Boyes Boulevard and Vailetti Drive.

Crews were dispatched to the sites to vacuum up the sewage and take it to a treatment plant. The Sonoma Valley district in January approved an ordinance requiring home and business owners to have sewer laterals that are 30 years or older inspected and repaired.

The ordinance was mandated by the San Francisco Bay Regional Water Quality Control Board as part of the enforcement action for the 2010 and 2014 sewage overflows.

The Sonoma Valley district serves 17,000 households and businesses from roughly Aqua Caliente Road to the city of Sonoma.

An estimated two-thirds of the sewer laterals in that area are at least 30 years old and likely in need of repair.

The sanitation district will offer free inspections of private sewer laterals and for a limited time offer rebates of up to $1,000 for repairs.

A low-interest loan program also is being considered that would allow qualified property owners to pay for repairs over a period of several years, according to Sherwood.

The program is expected to begin during the summer of 2017. Property owners will be notified when inspections are planned for their neighborhoods.

Gorin, who serves on the sanitation district’s board, acknowledged it will take years for such fixes to be put in place.

"It's not going to be a fast process, but if we do it methodically over the next decade, then I think we can stay in front of it," she said.

Sherwood said homeowners across Sonoma County can help reduce the risk of sewage overflows by curbing indoor water use, even during periods of heavy rainfall.

"During these major storms, if we reduce indoor water use, we reduce pressure on the system," Sherwood said.

You can reach Staff Writer Derek Moore at 707-521-5336 or derek.moore@pressdemocrat.com. On Twitter @deadlinederek.

EAST BAY TIMES

EAST OAKLAND: SINKHOLE OPENS BENEATH CAR; NO ONE HURT

By Harry Harris | hharris@bayareanewsgroup.com |
PUBLISHED: February 12, 2017

EAST OAKLAND — A sinkhole possibly 30 feet deep opened up Sunday morning, sucking a BMW car partially below the surface, officials said.

The car's owner was not in the vehicle, which was parked in the 2600 block of East 27th Street in the lower Dimond district when the sinkhole opened about 9:45 a.m. Sunday.

Authorities believe the sinkhole, which goes out almost 20 feet from the curb, may have resulted from underground erosion caused by Sausal Creek, a portion of which runs under the street.

There was no apparent damage to water, sewer or electrical lines. Authorities said the BMW, which may have suffered rear end damage, would have to be towed before repair work could start.

Firefighters were briefly on the scene, but the repair work was to be handled by city public works and sewer department personnel.

The car was parked outside the Gladman Mental Health Rehabilitation Center. East 27th Street was closed between Barry Place and 26th Avenue while repair work was done. It was not known if the Gladman facility was affected or how long the road would be closed. Buses and other vehicle traffic was being rerouted. Check back for updates.

***UPDATE* – 2/14/2017**

Repairs underway to repair large sinkhole

Workers from several agencies Monday were continuing to repair a large sinkhole that appeared Sunday morning in East Oakland, damaging utility lines and partially swallowing a parked car, officials said.

The hole, about 25 feet wide, 25 feet long and 20 feet deep, opened about 9:21 a.m. in the 2600 block of East 27th Street in the lower Dimond district.

No one was in a parked 1991 BMW that was left partly submerged. It was later towed out.

On Monday, workers from the city, PG& E and a private contractor were at the scene. It was not known when the hole would be refilled and all repairs completed, but crews were working around the clock to expedite the repairs, officials said.

Some underground sewer and storm drain lines were damaged as well as the roadway, officials said. All utilities in the vicinity are currently operating, they said.

Tamar Sarkissian, a PG& E spokeswoman, said the supports to a 6-inch gas line were damaged but no gas escaped. She said 41 customers in the area lost gas service after the utility decided to shut down the line to make repairs. PG& E also “de-energized” some streetlights at the request of the city. Workers created a temporary bypass, allowing customers to have their gas service restored.

The exact cause of the sinkhole is still being investigated. Officials had said Sunday it may have been triggered by underground erosion from Sausal Creek, which runs under East 27th Street.

— *Harry Harris, Staff*

EAST BAY TIMES

ILLEGAL DRAINING OF WATER CREATES HAVOC FOR IRONHOUSE SANITARY DISTRICT

By Roni Gehlke |
PUBLISHED: February 13, 2017

BETHEL ISLAND — The recent string of storms has led to saturated ground and standing water here, but residents illegally draining the excess water into the sewer system are wreaking havoc within the Ironhouse Sanitary District sewer collection and treatment systems.

Bethel Island residents have been hit especially hard by drains that have backed up and to fix the problem, some have removed their sewer clean-out covers, redirecting hundreds of thousands of gallons of water to enter into an already inundated sewer system, Ironhouse officials say.

District crews have also seen some residents connecting pumps to their private sewer laterals and pumping surface water off of their property into the sewer system. This illegal activity directly causes sewer overflows downstream at pump stations and within the sewer system, according to Ironhouse officials. It also overloads the treatment facility, leading to water quality violations, they say.

“Ironhouse does not run a combined sewer-storm system,” Chad Davisson, ISD general manager said. “This illegal activity of draining or pumping storm water into the sewer system has already led to sanitary sewer overflows, which the District has reported to the State of California Water Resources Control Board. It also leads to considerable added costs in overtime and energy consumption by pumping storm water from flooded properties.”

ISD rules prohibit residents from pumping storm water from flooded properties into the sewer system, and there are strict penalties for violation. Violation of the ordinance is a crime punishable by fines of $1,000 and/or 30 days in jail. Violations can also result in immediate disconnection of sewer service.

The District has issued several cease-and-desist notices to individuals who it has observed engaging in prohibited conduct.

“If the District’s treatment capacity is exceeded, inadequately treated waste could be discharged into the San Joaquin River, which can be a health and safety issue.” Davisson said.

Davisson asks that residents share this information with friends and neighbors to help prevent further costly and unhealthy sewer overflows on island neighborhoods. For more information, contact Ironhouse Sanitary District at 925-625-2279.

RENEWABLE ENERGY MAGAZINE
At the heart of clean energy journalism

U.S. Energy Department to provide $1.2 million for hydrothermal wastewater project in California

Wednesday, 15 February 2017

Dan McCue

Southern California Gas Co. will receive up to $1.2 million from the U.S. Energy Department for a pilot hydrothermal wastewater processing project.

SoCalGas is part of a consortium conducting the pilot, which will be required to share the cost at a minimum of 50 percent in order to receive federal funds. The consortium is being led by the Water Environment & Reuse Foundation.

A news release from SoCalGas stated the project will use hydrothermal processing technology to convert wastewater solids into biocrude and methane gas. The biocrude oil replaces fossil oil, providing green fuels with nearly zero net new carbon emissions. The methane gas can be used in the same ways as fossil natural gas.

The Central Contra Costa Sanitary District, near Oakland, California, will host the pilot system. In addition to WE&RF, which represents many of the 16,000 wastewater systems in the U.S, the consortium also includes Genifuel Corp. with technology from DOE's Pacific Northwest National Laboratory, Merrick & Co., Tesoro Corp., Metro Vancouver, MicroBio Engineering, Brown and Caldwell, and over a dozen utility partners.

Jeff Reed, SoCalGas' director of business strategy and advanced technology, said, "This new technology could have an enormous impact on energy and waste. Converting the wastewater solids produced by treatment plants in the U.S. with hydrothermal processing could produce about 128 billion cubic feet of natural gas per year and save treatment utilities $2.2 billion in solids disposal costs."

For additional information:

Southern California Gas Co.

Napa Valley Register

Sewage overflow contaminates Napa's Lake Park

KEVIN COURTNEY kcourtney@napanews.com

2/17/2017

Heavy storms this month have overwhelmed Napa Sanitation District lines near Stonehouse Drive, causing raw sewage to overflow into Lake Park in central Napa.

Following the Feb. 9 spill, the district put up “DANGER!” signs around the park, announcing “CONTAMINATED WATER KEEP OUT.”

Neighbors have begun to refer to Lake Park as “Lake Poop,” said Kim Korte, who lives within view of the sewage spill.

The neighborhood park is designed to fill with storm runoff during heavy rains, relieving pressure on the Napa River, then drain into the river when water levels have dropped.

This year's above-average rainfall totals have overwhelmed a separate system, Napa Sanitation's sewer lines. According to neighbors, sewage bubbled up at the intersection of Stonehouse and Edgewater drives and mixed with storm water ponding in Lake Park.

"During the first few days, it was quite smelly," Korte said of conditions earlier this month.

Since then, the temporary lake has shrunk in size and the odor has significantly abated, Korte said Thursday.

Napa Sanitation said in a news release Thursday afternoon that 25,000 gallons of dilute wastewater had flowed into a detention basin containing 5 million gallons of stormwater.

As soon as this happened, the district put up warning signs and reported the spill to the California Office of Emergency Services, the district said.

"There will be no long-term contamination effects in the area related to the sewer overflow. NapaSan will continue to monitor the Lake Park neighborhood in the coming storms and alert residents to any overflow incidents or threats to public health," the release said.

Water samples showed that enterococcus bacteria were present in the water within Lake Park. Enterococcus bacteria do not have a long survival period once outside of their host, because water temperature and exposure to ultraviolet light will kill the bacteria, the district said.

"Additionally, when water percolates into the grass and soil, the plant roots and soil itself naturally filter out contaminants, so it is not necessary to perform a formal cleanup effort," the district said.

In their posts on the Nextdoor social media site, neighbors expressed frustration that neither Napa Sanitation nor the city of Napa had done outreach to fully explain the situation.

John Coates, the director of the city's Parks and Recreation Services Department, said Thursday that the problem and the solution are in the hands of Napa Sanitation.

On Thursday, Tim Healy, Napa Sanitation's general manager, said the district would distribute a letter to residents on Friday that explained the situation in greater detail. The district could have done a better job at neighborhood outreach, he said.

Healy said the sewer system had been hit hard by this winter's drenching rains, with stormwater and water from an elevated water table entering cracked or damaged sewer pipes.

The treatment plant has handled up to 55 million gallons on some days, compared to 6 million gallons in the dry season, he said.

The area around Lake Park is a low point in the system, so water seeping into lines in other neighborhoods will tend to bubble up here, Healy said.

As far as he knew, this was the only time this winter that a sewage spill had occurred at this location, Healy said. There are about a dozen locations in the system where this has happened this winter, he said.

A year ago, the district's board of directors raised rates and set a more ambitious line replacement schedule. This summer, 5.7 miles of lines will be replaced to reduce stormwater intrusion, he said.

Most of the year, Lake Park is heavily used by the neighborhood for recreation. "When it's not raining, it's used for games, people throw their footballs, people play with their dogs," Korte said.

EAST BAY TIMES

Storms pour pollution into bay, Delta

More than 120 sewage overflows reported in three rainy weeks in January

By Denis Cuff

dcuff@bayareanewsgroup.com

The heavy storms that have washed away California's drought this season have come with a side effect: large slugs of pollution and sewage washing into San Francisco Bay and the Delta.

More than 120 sewage overflows were reported in three stormy weeks in January, and 85 sent waste into the bay or waterways leading to the bay, according to a report by the San Francisco Regional Water Quality Board, the state water pollution agency for the region.

In one case, the West Contra Costa Sanitary District plant in Richmond spilled 9 million gallons of partially treated effluent into a marsh leading to the bay when its effluent ponds proved too small to handle the waste in a storm.

Vallejo's sewer system discharged about 2 million gallons into the bay. The city of San Mateo spilled 260,000 gallons, the board said.

The East Bay Municipal Utility District spilled 5 million gallons of untreated sewage into the bay. Part of the blame for EBMUD's spills went to power and equipment failures, and part to rainwater infiltrating leaky pipes and overwhelming the sewage system, officials said.

"The storms absolutely are a time of high pollution into the bay," said Ian Wren, a staff scientist at San Francisco Baykeeper, an environmental group. "I think the sewage brings the pathogens that are the most risk to people."

Anne Sasaki, of San Francisco, discovered that firsthand. She ended up swallowing some bay water last week, got sick and threw up for the first time in 27 years of swimming in the bay.

"I attribute getting sick to all these things washing into the bay," Sasaki said. "The bay has gotten cleaner and cleaner over the years and decades, but maybe I should be more concerned about what's in the water after the storms."

Indeed, swimmers are advised to steer clear of body contact with open bay waters after a big storm.

"The common advice we give people is to avoid swimming in the three days after a big storm," said Hal MacLean, water management supervisor for the East Bay Regional

Park District. It manages bay swim areas at Keller Beach in the Miller Knox Regional Park in Richmond and Crown Beach in Alameda.

San Francisco Baykeeper has participated in negotiating legal agreements requiring the city of San Jose and EBMUD to take measures to reduce the sewage overflows.

“The sewage agencies haven’t done enough to prevent it,” Wren said, “but they are doing more now, and the problem is getting better.”

The impacts from sewage overflows are localized and near the shore, not throughout the whole bay, said Thomas Mumley, the regional water board’s assistant executive officer.

“We don’t advocate that dilution is the solution to pollution,” Mumley said, “but, fortunately, wet weather sewage overflows are highly diluted.”

San Francisco Bay has become much cleaner overall since the 1970s because of pollution controls and upgrades in sewer plants.

The regional board, however, is pressing sewage dischargers to continue reducing the overflows in ways such as improving public sewage pipes and equipment, and getting homeowners to replace leaky lateral sewage pipes that allow rain to seep into and overtax sewage systems.

Fixes can take years and millions of dollars, another price tag of upgrading infrastructure in the United States.

EBMUD, for example, has budgeted $5.6 million in the next year to reduce sewage overflows during wet weather and plans to spend a similar amount each year for the next 22 years, said Andrea Pook, a spokeswoman for the district.

The district also is taking more aggressive responses to sewage overflows and is notifying kayakers and boat-cleaning crews of spills near bay waters they use, Pook said.

In addition to the sewage, the bay and the Sacramento- San Joaquin River Delta receive big doses of chemicals, bacterial pollutants, pesticides, heavy metals, grit and debris that wash off streets.

Despite fears of pollution, much of the material that washes into the bay and Delta during big storms is dirt and sand that can benefit the environment, scientists and engineers say.

The sediment provides material to rebuild wetlands important as habitat for fish and birds, and to provide a first line of defense against shoreline flooding risks due to rising sea levels, they say.

So much sediment has washed into the bay this winter that the waterway has turned brown. A plume of sediment reaches well past the Golden Gate Bridge into the Pacific Ocean.

One environmental scientist said the sediment provides wetland rebuilding materials that have became scarcer since the construction of dams that blocked the flow of sediment downstream from the Sierra and other mountains.

But the sediment also is believed to carry some toxic mercury from mercury and gold mines that operated long ago, said Lester McKee, a senior scientist at the San Francisco Estuary Institute.

“The sediment is a good thing. The sediment is a bad thing,” he said. “We need the sediment. Unfortunately, the bay is very good at retaining these legacy pollutants. It’s like a bathtub.”

Cities and counties in the Bay Area have invested millions in controlling or preventing pollutants in urban runoff, he added.

Even though Ilana Peterson finds the bay murkier and dirtier after a big storm, the former triathlete won’t abandon her regular swims in the waters.

“I figure the pollution is very diluted,” the Berkeley woman said of her swim spots at Richmond and San Francisco beaches. “And many of us open-water swimmers feel we have a full body vaccination from swimming in the bay for many years. I haven’t gotten sick from it.”

Contact Denis Cuff at 925-943-8267.