LAS VIRGENES MUNICIPAL WATER DISTRICT

4232 Las Virgenes Road, Calabasas, CA 91302

AGENDA
REGULAR MEETING

Members of the public wishing to address the Board of Directors are advised that a statement of Public Comment Protocols is available from the Clerk of the Board. Prior to speaking, each speaker is asked to review these protocols and MUST complete a speakers' card and hand it to the Clerk of the Board. Speakers will be recognized in the order cards are received.

The Public Comments agenda item is presented to allow the public to address the Board on matters not on the agenda. The public may present comments on any agenda item at the time the item is called upon for discussion.

Materials prepared by the District in connection with subject matter on the agenda are available for public inspection at 4232 Las Virgenes Road, Calabasas, CA 91302. Materials prepared by the District and distributed to the Board during this meeting are available for public inspection at the meeting or as soon thereafter as possible. Materials presented to the Board by the public will be maintained as part of the records of these proceedings and are available upon written request to the Clerk of the Board.

5:00 PM June 26, 2018

PLEDGE OF ALLEGIANCE

1 **CALL TO ORDER AND ROLL CALL**

2 **APPROVAL OF AGENDA**

3 **PUBLIC COMMENTS**

Members of the public may now address the Board of Directors **ON MATTERS NOT APPEARING ON THE AGENDA**, but within the jurisdiction of the Board. No action shall be taken on any matter not appearing on the agenda unless authorized by Subdivision (b) of Government Code Section 54954.2

4 **CONSENT CALENDAR**

A **List of Demands: June 26, 2018 (Pg. 5)**
Ratify

B **Minutes: Regular Meeting of June 12, 2018 (Pg. 36)**
Approve

C **Request to Award Annual Purchase Orders (Pg. 46)**

Authorize the General Manager to issue annual purchase orders, in the specified amounts, to the vendors listed in Table 1 below for the period of July 1, 2018 through June 30, 2019; and authorize a 45-day extension, in the additional amount of $6,000, for an existing purchase order with Vince Barnes Automotive.

D **Fiscal Year 2018-19 Salary Resolution: Adoption (Pg. 49)**

Pass, approve and adopt Resolution No. 2537, establishing salaries for employees.

RESOLUTION NO. 2537

A RESOLUTION OF THE BOARD OF DIRECTORS OF LAS VIRGENES MUNICIPAL WATER DISTRICT ESTABLISHING SALARIES FOR EMPLOYEES

(Reference is hereby made to Resolution No. 2537 on file in the District's Resolution Book and by this reference the same is incorporated herein.)

5 **ILLUSTRATIVE AND/OR VERBAL PRESENTATION AGENDA ITEMS**

A **60th Anniversary Recognition of Partner in Service: Las Virgenes Enterprise**

B **Legislative and Regulatory Updates**

C **Water Supply Conditions Update**

6 **TREASURER**

7 **FACILITIES AND OPERATIONS**

A **Pure Water Demonstration Project: Equipment Procurement (Pg. 56)**
Waive the formal bidding requirement and authorize an informal, competitive process for procurement of the treatment equipment for the Pure Water Demonstration Project.

B **Tapia SCADA System Upgrade: Request for Proposals (Pg. 59)**
Authorize the issuance of a Request for Proposals to develop plans and specifications for the Tapia SCADA system upgrade using either Rockwell Automation PLCs with the Schneider Wonderware HMI or Schneider Modicon PLCs with the Schneider Wonderware HMI.

8 **RESOURCE CONSERVATION AND PUBLIC OUTREACH**

A **Resolution in Support of the Water Supply and Water Quality Act of 2018 (Pg. 105)**

Pass, approve, and adopt Resolution No. 2536, expressing support for the Water Supply and Water Quality Act of 2018.

RESOLUTION NO. 2536

A RESOLUTION OF THE BOARD OF DIRECTORS OF LAS VIRGENES MUNICIPAL WATER DISTRICT IN SUPPORT OF THE WATER SUPPLY INFRASTRUCTURE, WATER CONVEYANCE, ECOSYSTEM AND WATERSHED PROTECTION AND RESTORATION, AND DRINKING WATER PROTECTION ACT OF 2018

(Reference is hereby made to Resolution No. 2536 on file in the District's Resolution Book and by this reference the same is incorporated herein.)

B **Celebration of District's 60th Anniversary: Title Sponsorship of Reyes Adobe Days (Pg. 109)**

Authorize participation in Reyes Adobe Days, held from October 11 through 14, 2018, as a title sponsor, in the amount of $10,000.

9 **INFORMATION ITEMS**

A **Los Angeles County Safe, Clean Water Program Funding Measure (Pg. 111)**

B **Community Choice Aggregation: Clean Power Alliance (Pg. 115)**

10 **NON-ACTION ITEMS**

A **Organization Reports**

(1) MWD Representative Report

(2) Other

B **Director's Reports on Outside Meetings**

C **General Manager Reports**

(1) General Business

(2) Follow-Up Items

D **Director's Comments**

11 **FUTURE AGENDA ITEMS**

12 **PUBLIC COMMENTS**

Members of the public may now address the Board of Directors **ON MATTERS NOT**

APPEARING ON THE AGENDA, but within the jurisdiction of the Board. No action shall be taken on any matter not appearing on the agenda unless authorized by Subdivision (b) of Government Code Section 54954.2

13 **CLOSED SESSION**

A **Conference with District Counsel - Anticipated Litigation (Government Code Section 54956.9(d)(2) and (e)(3): EEOC Complaint**

14 **OPEN SESSION AND ADJOURNMENT**

Pursuant to Section 202 of the Americans with Disabilities Act of 1990 (42 U.S.C. Sec. 12132), and applicable federal rules and regulations, requests for a disability-related modification or accommodation, including auxiliary aids or services, in order to attend or participate in a meeting, should be made to the Executive Assistant/Clerk of the Board in advance of the meeting to ensure availability of the requested service or accommodation. Notices, agendas, and public documents related to the Board meetings can be made available in appropriate alternative format upon request.

LAS VIRGENES MUNICIPAL WATER DISTRICT

To: LEE RENGER, TREASURER

Payments for Board Meeting of : June 26, 2018

Deputy Treasurer has verified that all checks and wire transfers were issued in conformance with LVMWD Administrative Code Section 2-6.203.

Wells Fargo Bank A/C No. 4806-994448

Checks Nos. 79137 through 79286 were issued in the total amount of	$	970,265.40

Payments through wire transfers as follows:

Sub-Total Wires	$	-
Total Payments	$	970,265.40

(Reference is hereby to these demands on file in the District's Check Register and by this reference the same is incorporated herein and made a part hereof.)

CHECK LISTING FOR BOARD MEETING
06/26/18

Company Name	Company No.	Check No. 79137 thru 79207 06/12/18 Amount	Check No. 79208 thru 79286 06/19/18 Amount	Total
Potable Water Operations	101	111,490.50	21,773.50	133,264.00
Recycled Water Operations	102	511.99		511.99
Sanitation Operations	130	6,653.44	170.00	6,823.44
Potable Water Construction	201			-
Water Conservation Construction	203			
Sani- Construction	230			
Potable Water Replacement	301	3,780.00	36,872.58	40,652.58
Reclaimed Water Replace	302			-
Sanitation Replacement	330			
Internal Service	701	102,953.56	78,280.72	181,234.28
JPA Operations	751	225,571.21	55,853.67	281,424.88
JPA Construction	752			
JPA Replacement	754	5,889.59	324,538.00	330,427.59
				-
	Total Printed	**456,850.29**	**517,488.47**	**974,338.76**
Voided Checks/payment stopped:				
Check #76420	101	(242.76)		(242.76)
Check #76536	101	(82.34)		(82.34)
Check #77320	101	(3,748.26)		(3,748.26)
	Total Voids	**(4,073.36)**		**(4,073.36)**
	Net Total	**452,776.93**	**517,488.47**	**970,265.40**

Batch Number - 263105

Bank Account - 00146807 Cash-General

Payment Number	Payment Date	Address Number	Name	Payment Stub Message	Document Ty	Document Number	Key Itm	Key Co	Amount	Invoice Number
79137	06/12/18	19269	ACC BUSINESS	INTERNET 4/11~5/10/18	PV	158524	001	00701	916.45	181310493
				Payment Amount					916.45	
79138	06/12/18	19269	ACC BUSINESS	SCADA MLPS 4/11~5/10/18	PV	158525	001	00701	1,449.47	181338423
				SCADA MLPS 4/11~5/10/18	PV	158525	002	00701	800.21	181338423
				SCADA MLPS 4/11~5/10/18	PV	158525	003	00701	3,811.51	181338423
				SCADA MLPS 4/11~5/10/18	PV	158525	004	00701	148.83	181338423
				Payment Amount					6,210.02	
79139	06/12/18	17361	ACCURATE FIRST AID SERVICES	RLV FIRST AID SUPPLIES	PV	158430	001	00701	472.16	B-1788
				TAPIA FIRST AID SUPPLIES	PV	158431	001	00701	293.73	B-1789
				Payment Amount					765.89	
79140	06/12/18	2317	ACORN NEWSPAPER	LGL AD-TAPIA WRF REH	PV	158370	001	00701	216.00	M-0750
				LGL AD-AMENDMENT BID	PV	158371	001	00701	240.00	M-0751
				LGL AD-NIP PRINT SVC	PV	158432	001	00701	108.00	M-0753
				Payment Amount					564.00	
79141	06/12/18	8680	ADS, LLC	MAY'18 FLW MNTG	PV	158442	001	00701	725.00	22085.22-0518
				MAY'18 FLW MNTG	PV	158442	002	00701	2,175.00	22085.22-0518
				Payment Amount					2,900.00	
79142	06/12/18	20389	AIRGAS SPECIALTY PRODUCTS	32,240 LB AMMONIUM	PV	158508	001	00701	3,177.25	131542474
		Alt Payee	20559	AIRGAS SPECIALTY PRODUCTS P. O. BOX 934434 ATLANTA GA 31193-4434						
				Payment Amount					3,177.25	
79143	06/12/18	16224	ASBURY ENVIRONMENTAL	USED OIL SVC CHG-TAPIA	PV	158459	001	00751	35.00	I500-00328376

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			SERVICES							
				Payment Amount					35.00	
79144	06/12/18	2869	AT&T	SRV	PV	158419	001	00701	160.24	1984/052318
				5/23~6/22/18						
				SRV	PV	158420	001	00101	152.70	2430/052318
				5/23~6/22/18						
				SRV	PV	158421	001	00101	147.40	7426/052318
				5/23~6/22/18						
				Payment Amount					460.34	
79145	06/12/18	16253	AT&T MOBILITY	SRV	PV	158499	001	00701	122.91	9332/040318
				3/4/18~4/3/18						
				SRV	PV	158499	002	00701	19.44	9332/040318
				3/4/18~4/3/18						
				SRV	PV	158499	003	00701	72.49	9332/040318
				3/4/18~4/3/18						
				SRV	PV	158499	004	00701	303.90	9332/040318
				3/4/18~4/3/18						
				SRV	PV	158499	005	00701	31.98	9332/040318
				3/4/18~4/3/18						
				SRV	PV	158499	006	00701	83.40	9332/040318
				3/4/18~4/3/18						
				SRV	PV	158499	007	00701	42.50	9332/040318
				3/4/18~4/3/18						
				SRV	PV	158499	008	00701	13.61	9332/040318
				3/4/18~4/3/18						
				SRV	PV	158499	009	00701	5.83	9332/040318
				3/4/18~4/3/18						
				SRV	PV	158499	010	00701	83.40	9332/040318
				3/4/18~4/3/18						
				SRV	PV	158499	011	00701	342.96	9332/040318
				3/4/18~4/3/18						
				SRV	PV	158499	012	00701	34.19	9332/040318
				3/4/18~4/3/18						
				SRV	PV	158499	013	00701	85.00	9332/040318
				3/4/18~4/3/18						
				SRV	PV	158499	014	00701	524.94	9332/040318
				3/4/18~4/3/18						
				SRV	PV	158499	015	00701	36.44	9332/040318
				3/4/18~4/3/18						
				SRV	PV	158499	016	00701	19.44	9332/040318
				3/4/18~4/3/18						

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Payment Number	Payment Date	Address Number	Name	Payment Stub Message	Document Ty	Document Number	Key Itm	Key Co	Amount	Invoice Number
				SRV 3/4/18~4/3/18	PV	158499	017	00701	146.37	9332/040318
				SRV 3/4/18~4/3/18	PV	158499	018	00701	6.56	9332/040318
				SRV 3/4/18~4/3/18	PV	158499	019	00701	148.65	9332/040318
				SRV 3/4/18~4/3/18	PV	158499	020	00701	90.34	9332/040318
				Payment Amount				2,214.35		
79146	06/12/18	7965	B&B PALLET CO.	55 YDS WOOD CHIPS	PV	158444	001	00701	583.00	321156
				55 YDS WOOD CHIPS	PV	158445	001	00701	583.00	321165
				55 YDS WOOD CHIPS	PV	158446	001	00701	583.00	321171
				55 YDS WOOD CHIPS	PV	158447	001	00701	583.00	321174
				Payment Amount				2,332.00		
79147	06/12/18	4869	BIOVIR LABORATORIES, INC	CRYPTO TSTG 5/9/18	PV	158374	001	00101	365.00	180891
				Payment Amount				365.00		
79148	06/12/18	18071	BLUE DIAMOND MATERIALS	2.0TN PVNG MTL & EM BKT	PV	158443	001	00701	206.96	1180765
				Payment Amount				206.96		
79149	06/12/18	5224	C.E.R.T., INC.	SCBA & CNFD SPC/RSC	PV	158369	001	00701	2,790.00	20180040
				Payment Amount				2,790.00		
79150	06/12/18	7158	DAWN MARIE CALVIN	MS WORD EXAM-DC-6/1	PV	158424	001	00701	125.00	77-725WORD2016
				Payment Amount				125.00		
79151	06/12/18	7884	CHARLES CASPARY	EXP-ACWA CONF 5/8~5/11/18	PV	158475	001	00701	320.91	051118
				Payment Amount				320.91		
79152	06/12/18	20797	CHRIS' MOBILE TIRE SERVICE	VEH#863 (4) TIRES	PV	158427	001	00701	2,310.35	160918
				Payment Amount				2,310.35		
79153	06/12/18	20776	CHURCH PROPERTIES LLC	RFND CR BAL-CLOSED A/C	PV	153017	001	00101	242.76	057712
				Payment Amount				242.76		

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79154	06/12/18	3882	CH2M HILL, ENGINEERS, INC.	P/E 4/27 STRMWTR CAP	PV	158448	001	00701	13,819.00	381146474
				Payment Amount					13,819.00	
79155	06/12/18	2533	CITY OF AGOURA HILLS	1/9~5/21/18 ENCR PERMITS	PV	158464	001	00101	4,014.00	201805240984
				Payment Amount					4,014.00	
79156	06/12/18	2554	COASTLINE EQUIPMENT	VEH#709 1000HR SVC	PV	158529	001	00701	1,358.68	480510
				Payment Amount					1,358.68	
79157	06/12/18	20833	CPS HR CONSULTING	P/E 123017 COMP STDY	PV	158510	001	00701	41,186.25	INV358139
				Payment Amount					41,186.25	
79158	06/12/18	21012	DCH FORD OF THOUSAND OAKS	VEH#903 ELECTRL RPRS	PV	158462	001	00701	450.00	815353
				Payment Amount					450.00	
79159	06/12/18	11330	DIAL SECURITY	HQ BATTERY SVC	PV	158505	001	00701	225.00	325678
				Payment Amount					225.00	
79160	06/12/18	20685	DOCUMENT SYSTEMS INC	4/24~5/23/18 CANON MNT-C/S	PV	158507	001	00701	100.83	57682
				Payment Amount					100.83	
79161	06/12/18	18815	FASTENAL COMPANY	MAY BIN STOCK	PV	158460	001	00751	1,643.50	CACHA29809
				30 J-CLAMPS, 1/2 ID	PV	158461	001	00751	48.95	CACHA29637
	Alt Payee	18835	FASTENAL COMPANY P. O. BOX 1286 WINONA MN 55987-1286							
				Payment Amount					1,692.45	
79162	06/12/18	2658	FEDERAL EXPRESS CORP	1 PKG DELVIRED 5/16	PV	158426	001	00701	30.93	6-193-64507
				2 PKG DLVRD 5/24 & 5/25	PV	158533	001	00101	281.15	6-199-60701
				2 PKG DLVRD 5/24 & 5/25	PV	158533	002	00101	28.74	6-199-60701
				Payment Amount					340.82	
79163	06/12/18	2655	FERGUSON ENTERPRISES	CRDL 80-150 1 BS	PV	158463	001	00101	460.31	0633146
	Alt Payee	3207	FERGUSON ENTERPRISES, INC. #1083							

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Payment Number	Payment Date	Address Number	Name	Payment Stub Message	Document Ty	Document Number	Key Itm	Key Co	Amount	Invoice Number
			P. O. BOX 740827							
			LOS ANGELES CA 90074-0827							
				Payment Amount					460.31	
79164	06/12/18	2660	FISHER SCIENTIFIC	O & G 47MM DISKS	PV	158425	001	00701	309.29	6666414
		Alt Payee	3202 FISHER SCIENTIFIC							
			FILE #50129							
			LOS ANGELES CA 90074-0129							
				Payment Amount					309.29	
79165	06/12/18	4971	FUGRO USA LAND, INC.	P/E 5/17 QTR MNTG LRNZO	PV	158441	001	00701	2,195.00	04.62150074-17
		Alt Payee	6803 FUGRO USA LAND, INC.							
			P. O. BOX 301083							
			DALLAS TX 75303-1083							
				Payment Amount					2,195.00	
79166	06/12/18	6770	G.I. INDUSTRIES	6/18 HQ & SHOP DISPOSAL	PV	158527	001	00701	651.18	2859913-0283-4
				5/16~5/31/18 SHOP DISP	PV	158528	001	00701	631.31	2860081-0283-7
				6/18 WLK DISP	PV	158564	001	00701	292.54	2451365-0283-9
		Alt Payee	6771 G.I. INDUSTRIES							
			P. O. BOX 541065							
			LOS ANGELES CA 90054-1065							
				Payment Amount					1,575.03	
79167	06/12/18	16055	GOVERNMENTJOB S.COM, INC.	IE RNWL/JOB PSTG 6/18~6/19	PV	158526	001	00701	4,184.25	INV24173
				Payment Amount					4,184.25	
79168	06/12/18	2701	GRAINGER, INC.	PHASE MONITOR RELAY	PV	158428	001	00101	102.95	9768910623
				ENCLOSURE FILTER	PV	158429	001	00751	72.96	9768910615
		Alt Payee	5453 GRAINGER, INC.							
			DEPT 805178142							
			PALATINE IL 60038-0001							
				Payment Amount					175.91	
79169	06/12/18	2705	HACH COMPANY	VALVE ASSY	PV	158412	001	00701	1,701.72	10965452
		Alt Payee	6442 HACH COMPANY							

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			2207 COLLECTIONS CENTER DR								
			CHICAGO IL 60693								
				Payment Amount						1,701.72	
79170	06/12/18	16531	HAMILTON &	RFND	PV	158467	001	00101	758.77		9999292
			ASSOCIATES,	BAL-CLOSED							
			INC.	A/C							
				Payment Amount						758.77	
79171	06/12/18	18646	HDR	P/E	PV	158390	001	00701	3,532.90		1200122333
			ENGINEERING,	4/28-STDY-DL							
			INC.	DEVEL							
				Payment Amount						3,532.90	
79172	06/12/18	19370	ALAN HILL	CLAIM	PV	158477	001	00101	5,000.00		052317
				STL-4025							
				BLKBIRD							
				Payment Amount						5,000.00	
79173	06/12/18	21021	INNOVATIVE	RFND	PV	158468	001	00101	1,082.17		9999272
			CONSTRUCTION	BAL-CLOSED							
			SOLUTIONS	A/C							
				Payment Amount						1,082.17	
79174	06/12/18	2997	J G TUCKER &	H2S CYLINDER	PV	158543	001	00701	254.96		8365
			SONS								
				Payment Amount						254.96	
79175	06/12/18	2752	KAMAN	BUSHINGS/SHEA	PV	158435	001	00701	60.42		E482654
			INDUSTRIAL	VE							
			TECHNOLOGIES								
				HI PWR	PV	158436	001	00701	48.78		I560061
				V-BELTS							
				Payment Amount						109.20	
79176	06/12/18	20851	JOHN P.	RFND CR	PV	158465	001	00101	3,748.26		006015
			LAMORTE	BAL-OPEN A/C							
				Payment Amount						3,748.26	
79177	06/12/18	19396	JAY LEWITT	MLG-CLGS-LV	PV	158473	001	00701	14.39		051618
				FIN MTG 5/16							
				MLG-WTRWS MTG	PV	158474	001	00701	9.59		051718
				5/17/18							
				Payment Amount						23.98	
79178	06/12/18	21022	LON LUXENBERG	RFND	PV	158469	001	00101	35.01		008696
				BAL-CLOSED							
				A/C							
				Payment Amount						35.01	
79179	06/12/18	15714	MAXIMUS, INC.	MAXCARS MAINT	PV	158458	001	00701	2,050.00		001-2018

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Payment Number	Payment Date	Address Number	Name	Payment Stub Message	Document Ty	Document Number	Key Itm	Key Co	Amount	Invoice Number
				FY18-19						
				Payment Amount					2,050.00	
79180	06/12/18	2814	MCMASTER-CARR SUPPLY CO	FILTER BAGS	PV	158423	001	00701	74.91	63716337
		Alt Payee 3197	MC MASTER-CARR P. O. BOX 7690 CHICAGO IL 60680-7690							
				Payment Amount					74.91	
79181	06/12/18	14322	MILES CHEMICAL COMPANY, INC	9.12T FERRIC CHLORIDE	PV	158400	001	00701	4,961.67	525973
				Payment Amount					4,961.67	
79182	06/12/18	10037	MOUNTAINS RECREATION & CONSV AUTHORITY	RFND CR BAL-OPEN A/C	PV	158530	001	00101	17,570.63	059658
				Payment Amount					17,570.63	
79183	06/12/18	21010	NETSOURCE GLOBAL INC.	HP COLOR M750 PRNTR	PV	158373	001	00701	1,739.76	12035
				Payment Amount					1,739.76	
79184	06/12/18	20893	NEW WATER RESOURCES	CONCEPT DEVEL-PUREWTR	PV	158376	001	00701	5,889.59	1163
				Payment Amount					5,889.59	
79185	06/12/18	2302	OFFICE DEPOT	PAPER & MISC OFF SPPLY	PV	158500	001	00701	409.14	136732632001
				WIPES/PH BK/STAMP	PV	158501	001	00701	70.85	136732881001
				STAMP/SIGN	PV	158502	001	00701	46.50	136732882001
				STAND/PKG TAPE	PV	158503	001	00701	60.42	142816097001
				CALCULATORS & SPPLIES	PV	158504	001	00701	398.14	142816682001
				Payment Amount					985.05	
79186	06/12/18	16372	OLIN CORPORATION - CHLOR ALKALI	4,916 GAL HYPOCHLORITE	PV	158386	001	00701	3,036.64	2504114
				4,880 GAL HYPOCHLORITE	PV	158401	001	00701	3,014.40	2506613
				4,616 GAL HYPOCHLORITE	PV	158402	001	00701	2,851.33	2509239

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Payment Number	Payment Date	Address Number	Name	Payment Stub Message	Document Ty	Document Number	Key Itm	Key Co	Amount	Invoice Number
				4,940 GAL HYPOCHLORITE	PV	158403	001	00701	3,051.46	2511506
		Alt Payee	16373	OLIN CORPORATION - CHLOR ALKALI P.O. BOX 402766 ATLANTA GA 30384-2766						
				Payment Amount					11,953.83	
79187	06/12/18	13586	ORACLE AMERICA, INC.	JDE MAINT 2/23~5/22/18	PV	158385	001	00701	17,942.99	44131043
				Payment Amount					17,942.99	
79188	06/12/18	20581	PERFECT FIT ERGONOMICS LLC	2 ERGONOMIC CHAIRS	PV	158372	001	00701	860.54	1225
				Payment Amount					860.54	
79189	06/12/18	18821	LEONARD POLAN	O/P EXP-CASA CONF JAN'18	PD	158415	001	00701	209.31-	012618/RFND
				MLG-WTR SYMPSM 4/19/18	PV	158416	001	00701	26.81	041918
				EXP-ACWA CONF 5/8~12	PV	158417	001	00701	1,034.57	051218
				Payment Amount					852.07	
79190	06/12/18	13645	PSOMAS	SRV-STDBY CHG 18-19-APR	PV	158391	001	00701	3,780.00	140884
				Payment Amount					3,780.00	
79191	06/12/18	21023	MICHELLE RUMANES	RFND BAL-CLOSED A/C	PV	158470	001	00101	42.00	064476
				Payment Amount					42.00	
79192	06/12/18	20412	SHRED-IT USA LLC	MAY'18 DOC SHRDING SRV	PV	158375	001	00701	208.33	8124823408
				Payment Amount					208.33	
79193	06/12/18	2957	SOUTHERN CALIFORNIA EDISON	RW P/S 5/1~5/31/18	PV	158413	001	00751	43,606.38	4500-42/06011 8
				Payment Amount					43,606.38	
79194	06/12/18	2957	SOUTHERN CALIFORNIA EDISON	RLV CMPST PLNT 5/1~5/31/18	PV	158414	001	00751	25,689.05	5165-46/06011 8
				Payment Amount					25,689.05	
79195	06/12/18	2957	SOUTHERN	ENERGY CHGS	PV	158449	001	00101	1,734.01	2869/060218

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Payment Number	Payment Date	Address Number	Name	Payment Stub Message	Document Ty	Document Number	Key Itm	Key Co	Amount	Invoice Number
			CALIFORNIA EDISON	MAY'18						
				ENERGY CHGS MAY'18	PV	158449	002	00101	25.44	2869/060218
				ENERGY CHGS MAY'18	PV	158449	003	00101	454.17	2869/060218
				ENERGY CHGS MAY'18	PV	158449	004	00101	24.18	2869/060218
				ENERGY CHGS MAY'18	PV	158449	005	00101	79.87	2869/060218
				ENERGY CHGS MAY'18	PV	158449	006	00101	21.88	2869/060218
				ENERGY CHGS MAY'18	PV	158449	007	00101	15.59	2869/060218
				ENERGY CHGS MAY'18	PV	158449	008	00101	10.39	2869/060218
				ENERGY CHGS MAY'18	PV	158449	009	00101	24.18	2869/060218
				ENERGY CHGS MAY'18	PV	158449	010	00101	27.15	2869/060218
				ENERGY CHGS MAY'18	PV	158449	011	00101	25.44	2869/060218
				ENERGY CHGS MAY'18	PV	158449	012	00101	2,331.40	2869/060218
				ENERGY CHGS MAY'18	PV	158449	013	00101	7,517.62	2869/060218
				ENERGY CHGS MAY'18	PV	158449	014	00101	49.19	2869/060218
				ENERGY CHGS MAY'18	PV	158449	015	00101	2,616.44	2869/060218
				ENERGY CHGS MAY'18	PV	158449	016	00101	4,518.38	2869/060218
				ENERGY CHGS MAY'18	PV	158449	017	00101	23.93	2869/060218
				ENERGY CHGS MAY'18	PV	158449	018	00101	161.23	2869/060218
				ENERGY CHGS MAY'18	PV	158449	019	00101	4,029.39	2869/060218
				ENERGY CHGS MAY'18	PV	158449	020	00101	32,692.94	2869/060218
				ENERGY CHGS	PV	158449	021	00101	49,039.41	2869/060218

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Payment Number	Payment Date	Address Number	Name	Payment Stub Message	Document Ty	Document Number	Key Itm	Key Co	Amount	Invoice Number
				MAY'18						
				ENERGY CHGS	PV	158449	022	00101	26.29	2869/060218
				MAY'18						
				ENERGY CHGS	PV	158449	023	00101	827.39	2869/060218
				MAY'18						
				ENERGY CHGS	PV	158449	024	00101	1,038.89	2869/060218
				MAY'18						
				ENERGY CHGS	PV	158449	025	00101	4,506.52	2869/060218
				MAY'18						
				ENERGY CHGS	PV	158449	026	00101	545.86	2869/060218
				MAY'18						
				ENERGY CHGS	PV	158449	027	00101	956.43	2869/060218
				MAY'18						
				ENERGY CHGS	PV	158449	028	00101	899.31	2869/060218
				MAY'18						
				ENERGY CHGS	PV	158449	029	00101	3,122.82	2869/060218
				MAY'18						
				ENERGY CHGS	PV	158449	030	00101	27.70	2869/060218
				MAY'18						
				ENERGY CHGS	PV	158449	031	00101	1,080.85	2869/060218
				MAY'18						
				ENERGY CHGS	PV	158449	032	00101	28.70	2869/060218
				MAY'18						
				ENERGY CHGS	PV	158449	033	00101	333.92	2869/060218
				MAY'18						
				ENERGY CHGS	PV	158449	034	00101	26.57	2869/060218
				MAY'18						
				ENERGY CHGS	PV	158449	035	00101	7,316.02	2869/060218
				MAY'18						
				ENERGY CHGS	PV	158449	036	00101	1,626.23	2869/060218
				MAY'18						
				ENERGY CHGS	PV	158449	037	00101	8,586.25	2869/060218
				MAY'18						
				ENERGY CHGS	PV	158449	038	00101	1,280.08	2869/060218
				MAY'18						
				ENERGY CHGS	PV	158449	039	00101	2,796.83	2869/060218
				MAY'18						
				ENERGY CHGS	PV	158449	040	00101	11,401.41	2869/060218
				MAY'18						
				ENERGY CHGS	PV	158449	041	00101	4,017.39	2869/060218
				MAY'18						

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Payment Number	Payment Date	Address Number	Name	Payment Stub Message	Document Ty	Document Number	Key Itm	Key Co	Amount	Invoice Number
				ENERGY CHGS MAY'18	PV	158449	042	00101	5,517.03	2869/060218
				ENERGY CHGS MAY'18	PV	158449	043	00101	72.85	2869/060218
				ENERGY CHGS MAY'18	PV	158449	044	00101	678.93	2869/060218
				ENERGY CHGS MAY'18	PV	158449	045	00101	24.49	2869/060218
				ENERGY CHGS MAY'18	PV	158449	046	00101	64.07	2869/060218
				ENERGY CHGS MAY'18	PV	158449	047	00101	637.08	2869/060218
				ENERGY CHGS MAY'18	PV	158449	048	00101	1,542.52	2869/060218
				ENERGY CHGS MAY'18	PV	158449	049	00101	3,166.58	2869/060218
				ENERGY CHGS MAY'18	PV	158449	050	00101	24.18	2869/060218
				ENERGY CHGS MAY'18	PV	158449	051	00101	27.84	2869/060218
				ENERGY CHGS MAY'18	PV	158449	052	00101	26.44	2869/060218
				ENERGY CHGS MAY'18	PV	158449	053	00101	76.48	2869/060218
				ENERGY CHGS MAY'18	PV	158449	054	00101	28.06	2869/060218
				ENERGY CHGS MAY'18	PV	158449	055	00101	787.33	2869/060218
				ENERGY CHGS MAY'18	PV	158449	056	00101	511.99	2869/060218
				ENERGY CHGS MAY'18	PV	158449	057	00101	394.33	2869/060218
				ENERGY CHGS MAY'18	PV	158449	058	00101	2,158.75	2869/060218
				ENERGY CHGS MAY'18	PV	158449	059	00101	2,682.19	2869/060218
				Payment Amount					174,288.83	
79196	06/12/18	2958	SOUTHERN CALIFORNIA GAS CO	CONDUIT 3/21~4/19/18	PV	158422	001	00101	28.60	8400/052918
				Payment Amount					28.60	

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79197	06/12/18	21024	FRED STONE	RFND	PV	158471	001	00101	170.40	007360
				BAL-CLOSED						
				A/C						
				Payment Amount					170.40	
79198	06/12/18	3789	T & T TRUCK &	40 T	PV	158433	001	00701	5,670.00	0136050-IN
			CRANE SERVICE	CRANE/TRK						
				5/2~5/4						
				Payment Amount					5,670.00	
79199	06/12/18	19135	TRANSUNION	ONLN SRCH BAD	PV	158457	001	00701	123.00	974571/MAY18
			RISK &	DBT 5/18						
			ALTERNATIVE							
			DATA SOLUT							
				Payment Amount					123.00	
79200	06/12/18	3011	UNITED	AEROSOL	PV	158440	001	00701	273.64	83957
			SPECIALTIES	LUBRICANT						
				Payment Amount					273.64	
79201	06/12/18	17163	UNITED STATES	RFND	PV	158466	001	00101	269.59	061908
			REAL ESTATE	BAL-CLOSED						
			CORP	A/C						
				Payment Amount					269.59	
79202	06/12/18	20360	VELOCITY	RPLC HPF	PV	158531	001	00701	557.24	RA270001835:0
			TRUCK CENTER	SENSOR #851						1
				Payment Amount					557.24	
79203	06/12/18	2436	VINCE BARNES	BRKS/PLUGS/SR	PV	158377	001	00701	617.24	023255
			AUTOMOTIVE	V #892						
				SRV	PV	158378	001	00701	308.13	023256
				TRNS/OIL/FLTR						
				S#714						
				BTTRY/OIL/FLT	PV	158389	001	00701	294.75	023268
				RS#896						
				Payment Amount					1,220.12	
79204	06/12/18	3034	VORTEX	DOOR	PV	158509	001	00701	812.62	01-1238555-1
			INDUSTRIES	MAINTENANCE						
				DOOR	PV	158509	003	00701	849.56	01-1238555-1
				MAINTENANCE						
				DOOR	PV	158509	005	00701	110.82	01-1238555-1
				MAINTENANCE						
				Payment Amount					1,773.00	
79205	06/12/18	19685	W. LITTEN	SPRYFLD	PV	158387	001	00701	5,430.19	18031
			INC.	5/7~5/11/18						
				SPRYFLD	PV	158388	001	00701	4,938.80	18032

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				5/14~5/18/18 SPRYFLD 5/21~5/26	PV	158434	001	00701	5,186.89	18033
				Payment Amount					15,555.88	
79206	06/12/18	21025	KATHLEEN WAYMAN	RFND BAL-CLOSED A/C	PV	158472	001	00101	112.12	070041
				Payment Amount					112.12	
79207	06/12/18	18914	WECK LABORATORIES, INC.	COPPER/LEAD-8 D30088	PV	158379	001	00701	328.44	W8E1101-LV
				COPPER/LEAD-8 D30090	PV	158380	001	00701	171.36	W8E1103-LV
				COPPER/LEAD-8 E09131	PV	158381	001	00701	257.04	W8E1802-LV
				TAPIA EFFLNT-8E0911 2	PV	158382	001	00701	25.50	W8E1832-LV
				DIONIZED WTR-8E09113	PV	158383	001	00701	25.50	W8E1833-LV
				WLK RES-8E09114	PV	158384	001	00701	190.00	W8E1834-LV
				MALIBU CRK-8C06116	PV	158506	001	00701	3,333.16	W8D0002-LV
				Payment Amount					4,331.00	
				Total Amount of Payments Written					456,850.29	
				Total Number of Payments Written			71			

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79208	06/19/18	19071	A BEE MAN	BEE RMVL-5584 BONNEVILLE	PV	158633	001	00701	165.00	21040
				BEE RMVL-5303 LASHER	PV	158634	001	00701	125.00	21041
				BEE RMVL-30609 MAINMAST	PV	158635	001	00701	125.00	21026
				BEE RMVL-31565 RUSTIC OAK	PV	158636	001	00701	125.00	21056
				Payment Amount					540.00	
79209	06/19/18	20976	ACC CONSTRUCTION INC.	RFND BAL-CLOSED A/C	PV	158632	001	00101	417.83	9999182-1
				Payment Amount					417.83	
79210	06/19/18	2317	ACORN NEWSPAPER	BEYOND-RLV COMPOST AD	PV	158535	001	00751	1,152.00	870105/053118
				Payment Amount					1,152.00	
79211	06/19/18	19993	ALEXANDER'S CONTRACT SERVICES, INC.	5/1~5/25/18 MTR READS	PV	158491	001	00701	16,149.13	101667
				Payment Amount					16,149.13	
79212	06/19/18	2387	AMERRAY HYDRAULICS CORP	NPLS,BSHG,CPL G & ELB	PV	158652	001	00701	752.71	47572
				Payment Amount					752.71	
79213	06/19/18	5237	ARB INC.	RFND BAL-CLOSED A/C	PV	158630	001	00101	369.58	9999142-1
				Payment Amount					369.58	
79214	06/19/18	5625	ASSOC. OF WATER AGENCIES OF VENTURA CO	4 REG-CCWUC LNCH 5/23	PV	158536	001	00701	140.00	06-10886
				Payment Amount					140.00	
79215	06/19/18	16253	AT&T MOBILITY	ARV 5/4~6/3/18	PV	158698	001	00701	146.59	9332/060318
				ARV 5/4~6/3/18	PV	158698	002	00701	21.64	9332/060318
				ARV	PV	158698	003	00701	42.50	9332/060318

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				5/4~6/3/18 ARV	PV	158698	004	00701	330.00	9332/060318
				5/4~6/3/18 ARV	PV	158698	005	00701	31.98	9332/060318
				5/4~6/3/18 ARV	PV	158698	006	00701	83.40	9332/060318
				5/4~6/3/18 ARV	PV	158698	007	00701	42.50	9332/060318
				5/4~6/3/18 ARV	PV	158698	008	00701	13.61	9332/060318
				5/4~6/3/18 ARV	PV	158698	009	00701	5.83	9332/060318
				5/4~6/3/18 ARV	PV	158698	010	00701	83.40	9332/060318
				5/4~6/3/18 ARV	PV	158698	011	00701	344.66	9332/060318
				5/4~6/3/18 ARV	PV	158698	012	00701	15.68	9332/060318
				5/4~6/3/18 ARV	PV	158698	013	00701	85.00	9332/060318
				5/4~6/3/18 ARV	PV	158698	014	00701	480.40	9332/060318
				5/4~6/3/18 ARV	PV	158698	015	00701	19.91	9332/060318
				5/4~6/3/18 ARV	PV	158698	016	00701	19.44	9332/060318
				5/4~6/3/18 ARV	PV	158698	017	00701	147.50	9332/060318
				5/4~6/3/18 ARV	PV	158698	019	00701	149.65	9332/060318
				5/4~6/3/18 ARV	PV	158698	020	00701	90.34	9332/060318
				5/4~6/3/18 Payment Amount				2,154.03		
79216	06/19/18	18654	AT&T TELECONFERENCE SERVICES	CONF CALLS MAY 18	PV	158690	001	00701	122.47	806-013113
				CONF CALLS MAY 18	PV	158690	002	00701	37.43	806-013113
				CONF CALLS MAY 18	PV	158690	003	00701	136.57	806-013113

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				CONF CALLS MAY 18	PV	158690	004	00701	4.40	806-013113
				Payment Amount					300.87	
79217	06/19/18	9067	AUSTIN-MAC, INC.	SCREW-SLUDGE CONVEYOR	PV	158597	001	00701	14,353.00	28619
				SCRW SLDG TRNF CNVYR	PV	158598	001	00701	9,475.00	28620
				Payment Amount					23,828.00	
79218	06/19/18	21011	AXALTA COATING SYSTEMS, LLC	WHT URETHANE PAINT	PV	158655	001	00701	263.23	7503008623
				Payment Amount					263.23	
79219	06/19/18	7965	B&B PALLET CO.	55 YDS WOOD CHIPS	PV	158586	001	00701	583.00	321180
				55 YDS WOOD CHIPS	PV	158587	001	00701	583.00	321182
				55 YDS WOOD CHIPS	PV	158588	001	00701	583.00	117832
				55 YDS WOOD CHIPS	PV	158589	001	00701	583.00	117833
				55 YDS WOOD CHIPS	PV	158590	001	00701	583.00	117827
				55 YDS WOOD CHIPS	PV	158591	001	00701	583.00	117828
				55 YDS WOOD CHIPS	PV	158592	001	00701	583.00	117829
				Payment Amount					4,081.00	
79220	06/19/18	21026	HEATHER BALSTON	RFND BAL-CLOSED A/C	PV	158618	001	00101	52.50	075767
				Payment Amount					52.50	
79221	06/19/18	3665	BERRY GENERAL ENGINEERING CONTRACTOR	RFND BAL-CLOSED A/C	PV	158628	001	00101	354.30	9999022-1
				Payment Amount					354.30	
79222	06/19/18	18893	BILLTRUST	ONLN/FISERV-MAY'18	PV	158585	001	00701	3,270.89	184428
				Payment Amount					3,270.89	
79223	06/19/18	21027	BRECKENRIDGE PROPERTY FUND 2016, LLC	RFND BAL-CLOSED A/C	PV	158619	001	00101	98.66	074230

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Payment Number	Payment Date	Address Number	Name	Payment Stub Message	Document Ty	Document Number	Key Itm	Key Co	Amount	Invoice Number
				Payment Amount					98.66	
79224	06/19/18	2964	CA DEPARTMENT OF TAX&FEE ADMINISTRATIO N	SALES/USE TAX-MAY'18	PV	158669	001	00701	744.00	097-817885/05 3118
				Payment Amount					744.00	
79225	06/19/18	18739	CALIFORNIA HAZARDOUS SERVICES, INC.	JUN'18 OP SITE VISIT	PV	158595	001	00701	105.00	62852
				Payment Amount					105.00	
79226	06/19/18	18992	CDW GOVERNMENT	COMP ROOM CABELING	PV	158485	001	00701	240.90	MWC1257
		Alt Payee 19010	CDW GOVERNMENT 75 REMITTANCE DR., SUITE 1515 CHICAGO IL 60675-1515							
				Payment Amount					240.90	
79227	06/19/18	2522	CERTIFIED LABS	2 CS LUBRICANT	PV	158654	001	00701	853.99	3137591
		Alt Payee 6563	CERTIFIED LABS 23261 NETWORK PLACE CHICAGO IL 60673-1232							
				Payment Amount					853.99	
79228	06/19/18	2844	CHEMSEARCH	RUST CONVERTER	PV	158653	001	00701	289.08	3137304
		Alt Payee 3196	CHEMSEARCH 23261 NETWORK PLACE CHICAGO IL 60673-1232							
				Payment Amount					289.08	
79229	06/19/18	2565	CONEJO AWARDS	(4) 60TH ANNIV AWARDS	PV	158670	001	00101	858.00	94452
				Payment Amount					858.00	
79230	06/19/18	15755	CORE & MAIN LP	BRASS NIPPLES	PV	158696	001	00701	118.98	I721456
		Alt Payee 15948	CORE & MAIN LP P. O. BOX 28330 ST. LOUIS MO 63146							
				Payment Amount					118.98	
79231	06/19/18	2547	COUNTY	TAPIA MAY	PV	158651	001	00751	726.72	48892/053118

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			SANITATION DISTRICTS OF LA COUNTY	GRIT HAULING							
				Payment Amount						726.72	
79232	06/19/18	18917	CRITERION ENVIRONMENTAL , INC.	ASBESTOS & MOLD TSTG	PV	158671	001	00751	960.00		14962
				Payment Amount						960.00	
79233	06/19/18	16364	D&H WATER SYSTEMS INC.	PROBE MICRO 200	PV	158641	001	00101	1,031.25		I 2018-0558
				Payment Amount						1,031.25	
79234	06/19/18	18933	DAVIS WHOLESALE ELECTRIC, INC.	MCC BKT-HQ CMP CTR	PV	158673	001	00301	1,806.75		1021-433572
				FUSES-HQ CMP CTR	PV	158674	001	00301	90.83		1021-433767
				PTTY PAD, BOXES & RINGS	PV	158684	001	00701	34.26		1021-433698
				Payment Amount						1,931.84	
79235	06/19/18	19033	DENOVO VENTURES, LLC	JUL'18 DIST RCVRY	PV	158609	001	00701	4,592.00		52184
				Payment Amount						4,592.00	
79236	06/19/18	18111	ELECSYS INTERNATIONAL CORPORATION	JUL'18 MTR DVC MAINT	PV	158456	001	00701	310.00		0000000001778 71
				Payment Amount						310.00	
79237	06/19/18	14591	EMISSION COMPLIANT CONTROLS CORP.	ELEMENT CLNG & SVC	PV	158676	001	00701	3,089.00		PSO4212
	Alt Payee	15750	EMISSION COMPLIANT CONTROLS CORP. P. O. BOX 16727 IRVINE CA 92623-6727								
				Payment Amount						3,089.00	
79238	06/19/18	18815	FASTENAL COMPANY	FALL PROTECTION	PV	158537	001	00701	3,149.33		CACHA29985
	Alt Payee	18835	FASTENAL COMPANY P. O. BOX 1286 WINONA MN 55987-1286								

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Payment Number	Payment Date	Address Number	Name	Payment Stub Message	Document Ty	Document Number	Key Itm	Key Co	Amount	Invoice Number
				Payment Amount					3,149.33	
79239	06/19/18	2658	FEDERAL EXPRESS CORP	1 PKG DLVRD 5/29/18	PV	158694	001	00701	16.74	6-206-52620
				Payment Amount					16.74	
79240	06/19/18	19397	FIRST CHOICE SERVICES	HQ COFFEE SUPPLIES	PV	158647	001	00701	206.80	306911
				OPS COFFEE SUPPLIES	PV	158648	001	00701	90.08	306912
				RLV COFFEE SUPPLIES	PV	158649	001	00701	69.12	306913
				TAPIA COFFEE SUPPLIES	PV	158650	001	00701	103.81	306914
				Payment Amount					469.81	
79241	06/19/18	6770	G.I. INDUSTRIES	5/16~5/31/18 WLK DE DISP	PV	158599	001	00701	1,179.09	2451487-0283-1
				6/18 RLV FARM DISP	PV	158642	001	00751	88.38	2859912-0283-6
				6/18 RLV DISP	PV	158643	001	00751	88.38	2859911-0283-8
				6/18 TAPIA DISP	PV	158686	001	00701	917.58	2529865-0283-6
				5/16~5/31/18 TP RAGS DISP	PV	158688	001	00701	504.75	2529881-0283-3
				6/18 TAPIA GRIT DISP	PV	158691	001	00701	703.04	2529868-0283-0
	Alt Payee	6771	G.I. INDUSTRIES P. O. BOX 541065 LOS ANGELES CA 90054-1065							
				Payment Amount					3,481.22	
79242	06/19/18	20970	GARDA CL WEST, INC.	6/18 ARMORED TRNSP SVC	PV	158646	001	00701	294.84	10402867
				4/18 ARMOR TRNS SRV	PV	158689	001	00701	257.70	20300993
				Payment Amount					552.54	
79243	06/19/18	21028	JENNIFER GILLIS	RFND BAL-CLOSED A/C	PV	158620	001	00101	124.13	073601
				Payment Amount					124.13	
79244	06/19/18	2701	GRAINGER, INC.	GREASE RELIEF FTTNGS	PV	158481	001	00101	25.15	9787321844

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Payment Number	Payment Date	Address Number	Name	Payment Stub Message	Document Ty	Document Number	Key Itm	Key Co	Amount	Invoice Number
				2 SFTY HARNESSES	PV	158482	001	00701	820.49	9790765102
				FLUID EVACUATOR	PV	158483	001	00751	137.82	9794576695
				7 SPARE SHELVES	PV	158484	001	00701	135.82	9792216922
		Alt Payee	5453 GRAINGER, INC. DEPT 805178142 PALATINE IL 60038-0001							
				Payment Amount					1,119.28	
79245	06/19/18	3511	ICE MACHINE SALES & SERVICE CO.	RPR ICE MCHN-HQ	PV	158486	001	00701	282.00	0185528-IN
				Payment Amount					282.00	
79246	06/19/18	20838	IKES PUMP AND DRILLING	RFND BAL-CLOSED A/C	PV	158627	001	00101	381.54	9999037
				Payment Amount					381.54	
79247	06/19/18	20662	INPLANT SALES, LLC	VICTAULIC GASKETS	PV	158490	001	00751	150.23	15069
				Payment Amount					150.23	
79248	06/19/18	20856	INTERNATIONAL PRINTING & TYPESETTING INC	PSTG-WTR QLTY RPT	PV	158675	001	00701	8,262.00	21680
				Payment Amount					8,262.00	
79249	06/19/18	20823	INVOICE CLOUD INC.	ONLN BILL PMT-MAY'18	PV	158492	001	00701	5,589.50	964-2018_5
				Payment Amount					5,589.50	
79250	06/19/18	16393	JACK HENRY & ASSOCIATES, INC.	AUDIOTEL MNT-FY 18-19	PV	158683	001	00701	3,107.90	2851938
				Payment Amount					3,107.90	
79251	06/19/18	7133	JOHN DEERE FINANCIAL	NIPPLE, LUBE	PV	158700	001	00751	16.57	P19132
				Payment Amount					16.57	
79252	06/19/18	21029	ROCCO LAMURA	RFND BAL-CLOSED A/C	PV	158621	001	00101	9.69	075651
				Payment Amount					9.69	

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Payment Number	Payment Date	Address Number	Name	Payment Stub Message	Document Ty	Document Number	Key Itm	Key Co	Amount	Invoice Number
79253	06/19/18	3352	LAS VIRGENES MUNICIPAL WATER DISTRICT	RLV 4/27~5/25/18	PV	158487	001	00751	282.65	0909/053018
				WLK FLT 4/27~5/25/18	PV	158488	001	00101	164.78	0907/053018
				EQS TNK 4/24~5/22/18	PV	158489	001	00101	241.59	0896/053018
				Payment Amount					689.02	
79254	06/19/18	3483	DAVID LIPPMAN	CELL PHN EXP-5/4~6/3/18	PV	158668	001	00701	100.00	7898/060318
				Payment Amount					100.00	
79255	06/19/18	21030	CASA LUNA	RFND BAL-CLOSED A/C	PV	158622	001	00101	9.33	073482
				Payment Amount					9.33	
79256	06/19/18	7427	SUSAN MAC INNES	RFND BAL-CLOSED A/C	PV	158626	001	00101	48.02	074459
				Payment Amount					48.02	
79257	06/19/18	2842	NAPA AUTO PARTS	SPK PLUG BOOT/OXGN SNR	PV	158453	001	00701	77.72	4206-890891
				SPK PLUG TERM CBL	PV	158454	001	00701	15.89	4206-890896
				Payment Amount					93.61	
79258	06/19/18	20736	NATIONWIDE	SURETY BOND 5/18~5/19	PV	158638	001	00701	250.00	BD7900692571
				Payment Amount					250.00	
79259	06/19/18	18575	OAKSTONE GLASS CORPORATION	SRVR RM STORE FNT PART	PV	158455	001	00701	5,370.00	64077
				Payment Amount					5,370.00	
79260	06/19/18	20728	OLIVAREZ MADRUGA LEMIEUX & O'NEILL	LEGAL SRV-RETAINER 5/18	PV	158677	001	00701	7,000.00	3887
				LGL SRV-5/18 SP TRANS	PV	158678	001	00701	180.00	3883
				LGL SRV-5/18 LV v HARP	PV	158679	001	00701	2,795.29	3884

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Payment Number	Payment Date	Address Number	Name	Payment Stub Message	Document Ty	Document Number	Key Itm	Key Co	Amount	Invoice Number
				LGL SRV-5/18 ZUSSER	PV	158680	001	00701	9,264.48	3885
				LGL SRV- 5/18 SD2 v MWD	PV	158681	001	00701	151.13	4125
				LGL SRV-5/18 SD5 v MWD	PV	158682	001	00701	56.10	4115
				Payment Amount					19,447.00	
79261	06/19/18	21031	BETH OSLANDER	RFND BAL-CLOSED A/C	PV	158623	001	00101	71.27	074806
				Payment Amount					71.27	
79262	06/19/18	15824	OUTBACK FOOTWEAR	PTRC F/WEAR-BAIRD	PV	158584	001	00701	225.00	34430
				Payment Amount					225.00	
79263	06/19/18	18946	PACIFIC ADVANCED CIVIL ENGINEERING, INC.	P/E 5/31-DIGESTOR #1	PV	158493	001	00701	2,535.00	1582
				P/E 5/31 PROCESS AIR UPG	PV	158494	001	00701	9,223.00	1581
				Payment Amount					11,758.00	
79264	06/19/18	18874	PACIFIC HYDROTECH CORPORATION	RETENTN#4-DGS TR#1	PD	158639	001	00754	15,639.00-	RTN#4/10565
				PMT#4-DGSTR#1 REHAB	PV	158640	001	00701	312,780.00	10565/PMT#4
				Payment Amount					297,141.00	
79265	06/19/18	18181	PACIFIC WESTERN BANK	RETENTION#4-D GSTR#1	PV	158637	001	00754	15,639.00	10565/RTN#4
				Payment Amount					15,639.00	
79266	06/19/18	19164	DONALD PATTERSON	CELL EXP 3/1~6/28/18	PV	158645	001	00701	318.52	CELL/030118~0 62818
				Payment Amount					318.52	
79267	06/19/18	8484	PRAXAIR DISTRIBUTION, INC	CYLNDR RNT 4/20~5/20/18	PV	158576	001	00101	160.92	83089961

Alt Payee 8898 PRAXAIR DISTRIBUTION INC.
DEPT. LA 21511

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Payment Number	Payment Date	Address Number	Name	Payment Stub Message	Document Ty	Document Number	Key Itm	Key Co	Amount	Invoice Number
			PASADENA CA 91185-1511							
				Payment Amount					160.92	
79268	06/19/18	20334	PRUDENTIAL	5/18	PV	158544	001	00701	56.20	170833081
			OVERALL	UNFRMS/MATS/T						
			SUPPLY	WLS						
				5/18	PV	158544	002	00701	60.07	170833081
				UNFRMS/MATS/T						
				WLS						
				5/18	PV	158545	001	00701	56.20	170834553
				UNFRMS/MATS/T						
				WLS						
				5/18	PV	158545	002	00701	60.07	170834553
				UNFRMS/MATS/T						
				WLS						
				5/18	PV	158546	001	00701	56.20	170836148
				UNFRMS/MATS/T						
				WLS						
				5/18	PV	158546	002	00701	60.07	170836148
				UNFRMS/MATS/T						
				WLS						
				5/18	PV	158547	001	00701	56.20	170837646
				UNFRMS/MATS/T						
				WLS						
				5/18	PV	158547	002	00701	60.07	170837646
				UNFRMS/MATS/T						
				WLS						
				5/18	PV	158548	001	00701	71.34	170839138
				UNFRMS/MATS/T						
				WLS						
				5/18	PV	158548	002	00701	60.07	170839138
				UNFRMS/MATS/T						
				WLS						
				5/18	PV	158549	001	00701	9.60	170833076
				UNFRMS/MATS/T						
				WLS						
				5/18	PV	158549	002	00701	21.44	170833076
				UNFRMS/MATS/T						
				WLS						
				5/18	PV	158550	001	00701	9.60	170834548
				UNFRMS/MATS/T						
				WLS						

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Payment Number	Payment Date	Address Number	Name	Payment Stub Message	Document Ty	Document Number	Key Itm	Key Co	Amount	Invoice Number
				5/18 UNFRMS/MATS/T WLS	PV	158550	002	00701	21.44	170834548
				5/18 UNFRMS/MATS/T WLS	PV	158551	001	00701	9.60	170836143
				5/18 UNFRMS/MATS/T WLS	PV	158551	002	00701	21.44	170836143
				5/18 UNFRMS/MATS/T WLS	PV	158552	001	00701	9.60	170837641
				5/18 UNFRMS/MATS/T WLS	PV	158552	002	00701	21.44	170837641
				5/18 UNFRMS/MATS/T WLS	PV	158553	001	00701	9.60	170839133
				5/18 UNFRMS/MATS/T WLS	PV	158553	002	00701	21.44	170839133
				5/18 UNFRMS/MATS/T WLS	PV	158554	001	00701	236.23	170833079
				5/18 UNFRMS/MATS/T WLS	PV	158555	001	00701	235.53	170834551
				5/18 UNFRMS/MATS/T WLS	PV	158556	001	00701	235.53	170836146
				5/18 UNFRMS/MATS/T WLS	PV	158557	001	00701	235.53	170837644
				5/18 UNFRMS/MATS/T WLS	PV	158558	001	00701	244.90	170839136
				5/18 UNFRMS/MATS/T WLS	PV	158559	001	00701	32.80	170833080
				5/18 UNFRMS/MATS/T WLS	PV	158559	002	00701	30.83	170833080
				5/18 UNFRMS/MATS/T						

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Payment Number	Payment Date	Address Number	Name	Payment Stub Message	Document Ty	Document Number	Key Itm	Key Co	Amount	Invoice Number
				WLS						
				5/18	PV	158560	001	00701	32.80	170834552
				UNFRMS/MATS/T						
				WLS						
				5/18	PV	158560	002	00701	30.83	170834552
				UNFRMS/MATS/T						
				WLS						
				5/18	PV	158561	001	00701	32.80	170836147
				UNFRMS/MATS/T						
				WLS						
				5/18	PV	158561	002	00701	30.83	170836147
				UNFRMS/MATS/T						
				WLS						
				5/18	PV	158562	001	00701	32.80	170837645
				UNFRMS/MATS/T						
				WLS						
				5/18	PV	158562	002	00701	30.83	170837645
				UNFRMS/MATS/T						
				WLS						
				5/18	PV	158563	001	00701	32.80	170839137
				UNFRMS/MATS/T						
				WLS						
				5/18	PV	158563	002	00701	30.83	170839137
				UNFRMS/MATS/T						
				WLS						
				Payment Amount					2,257.56	
79269	06/19/18	20779	SAND MATERIALS & AGGREGATE SALES, INC	26.08 T FILL SAND	PV	158450	001	00701	511.35	65408
				Payment Amount					511.35	
79270	06/19/18	2948	SMITH PIPE & SUPPLY	CAPS & ELLS	PV	158695	001	00701	153.02	3290570
				Payment Amount					153.02	
79271	06/19/18	16120	SOIL CONTROL LAB	RANCHO CMPST TSTG	PV	158534	001	00751	349.00	8050411
				Payment Amount					349.00	
79272	06/19/18	2958	SOUTHERN CALIFORNIA GAS CO	JBR P/S 5/1~5/31/18	PV	158578	001	00101	15.65	1200/060418
				HQ & OPS	PV	158579	001	00701	936.79	3600/060618

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Payment Number	Payment Date	Address Number	Name	Payment Stub Message	Document Ty	Document Number	Key Itm	Key Co	Amount	Invoice Number
				5/3~6/4/18						
				TAPIA	PV	158580	001	00751	450.41	4000/060618
				5/3~6/4/18						
				RANCHO	PV	158581	001	00751	755.78	4200/060618
				5/3~6/4/18						
				CORNELL	PV	158582	001	00101	717.29	0400/060618
				5/3~6/4/18						
				WLK P/S	PV	158583	001	00101	16.15	9400/060118
				5/1~6/1/18						
				Payment Amount					2,892.07	
79273	06/19/18	21032	IRIS SPIVAK	RFND	PV	158624	001	00101	102.86	074485
				BAL-CLOSED						
				A/C						
				Payment Amount					102.86	
79274	06/19/18	16271	SPOK, INC.	PAGER SRV	PV	158697	001	00701	70.91	B0143084R
				6/11~7/10/18						
				PAGER SRV	PV	158697	002	00701	.49	B0143084R
				6/11~7/10/18						
				PAGER SRV	PV	158697	003	00701	42.19	B0143084R
				6/11~7/10/18						
				Payment Amount					113.59	
79275	06/19/18	14479	STEPHEN'S	VIDEO SRV LV	PV	158451	001	00701	547.50	5-30-18
			VIDEO	MTG MAY'18						
			PRODUCTIONS							
				VIDEO SRV JPA	PV	158452	001	00701	547.50	5-31-18
				MTG MAY'18						
				Payment Amount					1,095.00	
79276	06/19/18	20813	TETRA TECH,	RFND	PV	158631	001	00101	371.93	9998932-1
			INC.	BAL-CLOSED						
				A/C						
				Payment Amount					371.93	
79277	06/19/18	17645	TORO	RFND	PV	158629	001	00101	354.30	9999007-1
			ENTERPRISES	BAL-CLOSED						
			INC.	A/C						
				Payment Amount					354.30	
79278	06/19/18	20935	US METRO	JANTRL SRV	PV	158497	001	00701	8,267.50	96297
			GROUP, INC.	MAY'18						
				JANTRL SRV	PV	158497	003	00701	2,325.83	96297
				MAY'18						
				JANTRL SRV	PV	158497	005	00701	190.83	96297
				MAY'18						

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Payment Number	Payment Date	Address Number	Name	Payment Stub Message	Document Ty	Document Number	Key Itm	Key Co	Amount	Invoice Number
				Payment Amount				10,784.16		
79279	06/19/18	18923	VAULT ACCESS SOLUTIONS	(6) ACCESS HATCHES	PV	158600	001	00701	34,975.00	458
				Payment Amount				34,975.00		
79280	06/19/18	13326	VILLA ESPERANZA SERVICES	LANDSCAPE SRV-MAY'18	PV	158498	001	00701	1,404.15	LVMWD-2018-5
				LANDSCAPE SRV-MAY'18	PV	158498	002	00701	3,968.25	LVMWD-2018-5
				LANDSCAPE SRV-MAY'18	PV	158498	004	00701	732.60	LVMWD-2018-5
				Payment Amount				6,105.00		
79281	06/19/18	3035	VWR SCIENTIFIC	GLASS FLASKS	PV	158577	001	00701	262.77	8082179171
		Alt Payee 3216	VWR INTERNATIONAL, INC P. O. BOX 640169 PITTSBURGH PA 15264-0169							
				Payment Amount				262.77		
79282	06/19/18	3048	WEST COAST AIR CONDITIONING	PM & FLTRS-BD#8	PV	158511	001	00701	650.00	S92344
				SRV CHILLER ALARM-BD#8	PV	158512	001	00701	272.00	S92426
				PM/FLTRS-RANCHO	PV	158513	001	00701	385.00	S92347
				RPLC BELTS-RANCHO	PV	158514	001	00701	29.13	S92588
				PM/FLTRS-BD#2	PV	158515	001	00701	30.00	S92011
				PM/FLTRS-BD#7	PV	158516	001	00701	265.00	S92340
				BELT-BD#7	PV	158517	001	00701	30.01	S92591
				PM/FLTRS-LV2	PV	158518	001	00701	115.00	S92343
				PM/FLTR-CORNELL	PV	158519	001	00701	50.00	S92345
				PM/FLTRS-L/S#1	PV	158520	001	00701	108.00	S92348
				PM/FLTRS-L/S#2	PV	158521	001	00701	62.00	S92349
				PM/FLTRS-WFP	PV	158522	001	00701	45.00	S92004
				PM/FLTRS-TAPIA	PV	158523	001	00701	135.00	S92346

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Payment Number	Payment Date	Address Number	Name	Payment Stub Message	Document Ty	Document Number	Key Itm	Key Co	Amount	Invoice Number
				Payment Amount					2,176.14	
79283	06/19/18	21035	WESTLAKE PROPERTIES, INC.	ESTMNT-APN 2060-001-019	PV	158667	001	00101	1.00	2060-001-019
				Payment Amount					1.00	
79284	06/19/18	3067	XEROX CORPORATION	4/18 LEASE-HQ & TAPIA	PV	158476	001	00701	402.16	702195551
				4/18 LEASE-HQ & TAPIA	PV	158476	002	00701	84.08	702195551
				4/18 LEASE-HQ & TAPIA	PV	158476	003	00701	46.19	702195551
				4/18 LEASE-HQ & TAPIA	PV	158476	004	00701	76.09	702195551
				4/18 LEASE-HQ & TAPIA	PV	158476	005	00701	508.86	702195551
				4/18 LEASE-HQ & TAPIA	PV	158476	006	00701	106.38	702195551
				4/18 LEASE-HQ & TAPIA	PV	158476	007	00701	58.45	702195551
				4/18 LEASE-HQ & TAPIA	PV	158476	008	00701	12.07	702195551
				4/18 LEASE-HQ & TAPIA	PV	158476	009	00701	130.79	702195551
				4/18 LEASE-HQ & TAPIA	PV	158476	010	00701	63.02	702195551
				4/18 LEASE-HQ & TAPIA	PV	158476	011	00701	18.41	702195551
				4/18 LEASE-HQ & TAPIA	PV	158476	012	00701	5.43	702195551
				4/18 LEASE-HQ & TAPIA	PV	158476	013	00701	537.96	702195551
				4/18 LEASE-HQ & TAPIA	PV	158476	014	00701	112.47	702195551
				4/18 LEASE-HQ & TAPIA	PV	158476	015	00701	61.79	702195551
				4/18 LEASE-HQ & TAPIA	PV	158476	016	00701	447.25	702195551
				4/18 LEASE-HQ & TAPIA	PV	158476	017	00701	114.15	702195551
				4/18 LEASE-HQ & TAPIA	PV	158476	018	00701	23.86	702195551

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Payment Number	Payment Date	Address Number	Name	Payment Stub Message	Document Ty	Document Number	Key Itm	Key Co	Amount	Invoice Number
				4/18 LEASE-HQ	PV	158476	019	00701	13.12	702195551
				& TAPIA						
				Payment Amount				2,822.53		
79285	06/19/18	20592	YORK RISK SERVICES GROUP, INC.	BANK FEES &. OMLO CHGS	PV	158644	001	00101	4,306.74	LVMWD-053118
				Payment Amount				4,306.74		
79286	06/19/18	21033	SHERRY ZAMUDIO	RFND BAL-CLOSED A/C	PV	158625	001	00101	45.79	070209
				Payment Amount				45.79		
				Total Amount of Payments Written				517,488.47		
				Total Number of Payments Written			79			

LAS VIRGENES MUNICIPAL WATER DISTRICT

4232 Las Virgenes Road, Calabasas CA 91302

MINUTES
REGULAR MEETING

5:00 PM June 12, 2018

PLEDGE OF ALLEGIANCE

The Pledge of Allegiance to the Flag was led by Lynda Lo-Hill.

1. CALL TO ORDER AND ROLL CALL

The meeting was called to order at **5:00 p.m.** by Board President Peterson in the Board Room at Las Virgenes Municipal Water District headquarters at 4232 Las Virgenes Road, Calabasas, CA 91302. Josie Guzman, Clerk of the Board, conducted the roll call.

Present:	Directors Charles Caspary, Len Polan, Glen Peterson, and Lee Renger.
Absent:	Director Jay Lewitt
Staff Present:	David Pedersen, General Manager
	David Lippman, Director of Facilities and Operations
	Joe McDermott, Director of Resource Conservation and Public Outreach
	Don Patterson, Director of Finance and Administration
	Josie Guzman, Clerk of the Board
	Wayne Lemieux, District Counsel

2. APPROVAL OF AGENDA

General Manager David Pedersen asked the Board to consider adding an item to the agenda for Closed Session, Anticipated Litigation, pursuant to Government Code Section 54956.9(d)(2) and (e)(3). He stated that the need to add the item arose after the agenda was posted and action was required prior to the next Regular Board Meeting.

Director Renger moved to add the Closed Session item and approve the agenda as amended. Motion seconded by Director Polan. Motion carried by the following vote:

AYES: Caspary, Peterson, Polan, Renger
NOES: None
ABSTAIN: None
ABSENT: Lewitt

3. PUBLIC COMMENTS

None.

4. CONSENT CALENDAR

Board President Peterson noted that a letter was submitted by Armorcast Products Company for Item 4E requesting that the award of water utility boxes and covers be denied due to concerns with the proposed plastic meter boxes. He also noted that a letter was submitted from Indian Hills Mobile Home Village for Item 4F, which included additional information regarding the contractor who installed the new pressure regulator equipment. Director Caspary asked to pull Item 4E for discussion.

A List of Demands: June 12, 2018: Ratify

B Minutes: Regular Meeting of May 22, 2018: Approve

C Directors' Per Diem – May 2018: Ratify

D Monthly Cash and Investment Report – April 2018

Receive and file the Monthly Cash and Investment Report for April 2018.

F Claim by Indian Hills Mobile Home Village, et al.

Deny nine claims from the Indian Hills Mobile Home Village and residents.

G Renewal of Dog Park Agreement with the City of Calabasas

Execute an Agreement for the Management of the Dog Park on District Property with the City of Calabasas, in the amount of $1 annually, with expiration of a five-year term on September 30, 2023.

Director Polan moved to approve the Consent Calendar as amended. Motion seconded by Director Caspary. Motion carried by the following vote:

AYES: Caspary, Peterson, Polan, Renger
NOES: None
ABSTAIN: None

ABSENT: Lewitt

4. CONSENT CALENDAR – Separate Action Item

E Water Utility Boxes and Covers: Award

Accept the bid from Dangelo Company and authorize the General Manager to issue a one-year purchase order, in the amount of $68,427.65, with four one-year renewal options.

Director Caspary inquired whether staff had investigated Armorcast Product Company's (Armorcast) concerns with the proposed plastic meter boxes. Darrell Johnson, Customer Service Supervisor, responded that staff had not contacted other agencies regarding the claims submitted by Armorcast on concerns with plastic meter boxes; however, the H-20 rated boxes were selected due to their higher traffic rating and ability to reduce injuries to employees from lifting. Don Patterson, Director of Finance and Administration, added that the Request for Proposals required the supplier to provide independent verification of meeting the H-20 standards set by the American National Standards Institute Society of Telecommunication Engineers. He noted that the respondent to the Request for Proposals provided independent verification that their boxes met the specified standards. He also noted that Armorcast did not submit a proposal.

Director Caspary moved to approve Item 4E. Motion seconded by Director Renger. Motion carried by the following vote:

AYES: Caspary, Peterson, Polan, Renger
NOES: None
ABSTAIN: None
ABSENT: Lewitt

5. ILLUSTRATIVE AND/OR VERBAL PRESENTATION AGENDA ITEMS

A Legislative and Regulatory Updates

Joe McDermott, Director of Resource Conservation and Public Outreach, presented the report. He noted that SB 623, the water tax/budget trailer bill, was not included in the Governor's budget; however, the bill could move forward as a standalone bill with no appropriation. He reported that on May 31st, Governor Brown signed SB 606 and AB 1606 related to *Making Conservation as a California Way of Life*. He stated that staff would bring back information regarding how these new laws would impact the District's 20 percent by 2020 mandate and District operations. He also reported that SB 998, Discontinuance of Residential Water Service, moved to the Assembly Committee on Environmental Safety and Toxic Materials. He noted that letters in opposition were sent to Senator Stern and Assemblymember Bloom, and copies of the letters were provided to the Board. He also reported that AB 2050, the Small Water System Authority Act, moved to the Senate with minor amendments. He reported that Senator Kamala Harris introduced federal legislation for the Water Affordability Act of 2018, which would include

a program for low-income sewer and water assistance and award grants to water agencies. He noted that the Association of California Water Agencies (ACWA) supports this bill.

B Water Supply Conditions Update

Joe McDermott, Director of Resource Conservation and Public Outreach, presented the report.

C Las Virgenes Municipal Water District Comprehensive Water Conservation Plan Fiscal Years 2018-19

Receive and file the Comprehensive Water Conservation Plan (CWCP) for Fiscal Years 2018-20, and provide feedback to staff for potential refinements to the CWCP.

Dave Roberts, Resource Conservation Manager, presented a PowerPoint presentation. He noted that he and Mike McNutt, Public Affairs and Communications Manager, met with staff from the City of Beverly Hills regarding its high water use account review and one-on-one customer consultation program. He responded to questions regarding the effectiveness of the City of Beverly Hills' program in reducing individuals' water usage through personal outreach to property house managers, tenants, and homeowners. He also responded to a question regarding the basis of the data used in developing the criteria for Options 1, 2 and 3 for the Weather Based Irrigation Controller (WBIC) program by stating that the data was based on staff's experience. He stated that staff would provide an update after the WBIC program is implemented. He also responded to a question regarding the selection of the WBIC supplier by stating that staff would seek a WBIC that has a flow meter associated with it to determine how much water is used indoors as compared to outdoors.

Director Caspary inquired regarding the number of rain barrels given away to customers. He noted that he had previously suggested reaching out to customers who were given rain barrels to determine whether they continue to use them, and if not perhaps give them to someone else. Dave Roberts, Resource Conservation Manager, responded that approximately 350 rain barrels were given away in 2016 and MWD gave away approximately 50 rain barrels the previous five years. He stated that staff could include in the outreach program to reach out to the customers who received rain barrels to determine whether or not they are being used, and if not they could be repurposed. He also noted that staff is looking to select more aesthetically-pleasing barrels.

A video entitled "Southern California Inland Native Garden", depicting the use of native plants for landscaping, was presented to the Board.

Director Renger moved to receive and file Item 5C. Motion seconded by Director Caspary.

A discussion ensued regarding staff obtaining copies of other agencies' staff reports on turnkey WBIC programs to see what issues they faced and learn from their experience.

Another discussion ensued regarding the proposed WBIC program and the need for customers to have WIFI access so that information could be transmitted to their smartphone or computer.

Motion carried by the following vote:

AYES: Caspary, Peterson, Polan, Renger
NOES: None
ABSTAIN: None
ABSENT: Lewitt

6. TREASURER

Director Renger stated that the Treasurer's report was in order.

7. GENERAL MANAGER

A Unrepresented Employees Compensation

Authorize the General Manager to execute revisions to the Management Handbook and to implement a 3.5 percent increase to base salaries for unrepresented employees.

General Manager David Pedersen presented the report.

Director Caspary moved to approve Item 7A. Motion seconded by Director Polan.

A discussion ensued regarding the amount of time off given by other agencies for jury duty service and concerns with granting unlimited time off for jury duty service.

Director Caspary moved to amend the motion to include that up to 240 hours per fiscal year be granted for jury duty service. Motion seconded by Director Renger.

Motion carried by the following vote:

AYES: Caspary, Peterson, Polan, Renger
NOES: None
ABSTAIN: None
ABSENT: Lewitt

Board President requested that consideration for a "most favored nation" clause be given for this group in the future.

8. FINANCE AND ADMINISTRATION

A Approval of Memoranda of Understanding with Management and the Supervisor, Professional, and Confidential Units: June 1, 2018 through December 31, 2018

Authorize the General Manager to execute Memoranda of Understanding with the Management Unit and Supervisor, Professional, and Confidential Unit for a term of June 1, 2018 through December 31, 2018.

General Manager David Pedersen presented the report. He noted typographical errors in Article 6 Compensation in both MOUs, which should indicate that they would be effective the first pay period in June 2018.

Director Renger moved to approve Item 9A as amended. Motion seconded by Director Caspary. Motion carried by the following vote:

AYES: Caspary, Peterson, Polan, Renger
NOES: None
ABSTAIN: None
ABSENT: Lewitt

9. RESOURCE CONSERVATION AND PUBLIC OUTREACH

A State Water Supply Infrastructure, Water Conveyance, Ecosystem and Watershed Protection and Restoration and Drinking Water Protection Act of 2018

Receive an oral presentation and direct staff to return to the Board with a resolution supporting the State Water Supply Infrastructure, Water Conveyance Ecosystem and Watershed Protection and Restoration and Drinking Water Protection Act of 2018.

Joe McDermott, Director of Resource Conservation and Public Outreach, presented the report. He responded to a question regarding whether grants or loans would be funded from this bond by stating that grants would be funded for recycling projects, which would be administered by the State Water Resources Control Board (State Board). He noted that the State Board would seek a minimum 50 percent match.

Director Polan moved to approve Item 9A. Motion seconded by Director Renger. Motion carried by the following vote:

AYES: Caspary, Peterson, Polan, Renger
NOES: None
ABSTAIN: None
ABSENT: Lewitt

10. NON-ACTION ITEMS

A Organization Reports

(1) MWD Representative Report/Agenda(s)

Board President Peterson noted that the Colorado River Board would meet on June 13th to elect a new Chair. He reported that he attended the MWD Board meeting earlier in the day, and noted that Board Member Mark Gold objected to Congressman Ken Calvert and Congressman David Valadao's riders in the draft spending budget related to exempting the California WaterFix from judicial review. He also noted that Board Member Gold requested an agenda item for the MWD Board to take a position on this matter; however, a majority of the Executive Committee would need to support taking a position. He also reported that the MWD Board approved payment in the amount of $708,800 to support the Colorado River Board for the coming fiscal year.

(2) Other

Director Caspary reported that the Santa Monica Bay Restoration Committee and the Watershed Advisory Council would meet on June 21st to review the Work Plan for the Bay Restoration Project. He noted that the Environmental Protection Agency mandated several changes to the plan, and there are competing interests who want to have funds dedicated to the Ballona Wetlands Restoration or some other restoration project. He noted that Proposition 84 provided grant funds for environmental restoration projects, and the California Coastal Conservancy determined that several project would not be able to meet the deadline to use those funds. He stated that these grant funds would be repurposed and identified for other projects. He also stated that subsequently it was determined that Proposition 50 funding included the same sunset issue as Proposition 84, and the California Coastal Conservancy would need to provide notice that Proposition 50 funds will become available.

B Director's Reports on Outside Meetings

None.

C General Manager Reports

(1) General Business

General Manager David Pedersen reported staff had followed up on Proposition 12 funding and found that projects anticipated to receive those funds would not meet the deadline. He noted that staff discussed Proposition 12 guidelines and proposed submitting a grant application for the Pure Water Demonstration Project and a grant application for the Summertime Compliance Nitrogen Removal Project at the Tapia Water Reclamation Facility. He also stated that staff would follow-up on Proposition 50 and Proposition 84 funding. He further reported that approval was received today for the required flow augmentation to Malibu Creek, which would begin later in the week to trim the flow in Malibu Creek up to 2.5 cubic feet per second (CFS).

(2) Follow-Up Items

D Directors' Comments

None.

11. FUTURE AGENDA ITEMS

Board President Peterson requested an item to discuss a tribute to recognize former Director Hal Helsley. He noted that Director Helsley served on the Board for 20 years and he implemented the composting plant. Director Renger suggested also discussing taking part in the grove that will be planted at King Gillette Ranch.

12. PUBLIC COMMENTS

Jason Schulz, resident of the Indian Hills Mobile Home Village, stated that he understood the developer would be responsible for his claim and inquired whether he could expect to be contacted by the developer. David Lippman, Director of Facilities and Operations, responded that either the developer or the contractor would contact Mr. Schulz. He noted that staff spoke with the developer's representative who is working with their contractor to accept the responsibility. He also noted that the developer assured staff they had withheld payment to their contractor to cover the cost of the claims.

Mr. Schulz spoke in support of all District employees being provided the same amount of time off for jury duty service. He also inquired whether the residents of the Indian Hills Mobilehome Village would be eligible for the District's water conservation programs. General Manager David Pedersen responded that staff would follow-up with Mr. Schulz. Board President Peterson suggested that Mr. Schulz visit the bewaterwise.com website for water conservation information.

13. CLOSED SESSION

Added Item:

Conference with District Counsel - Anticipated Litigation (Government Code Section 54956.9(d)(2) and (e)(3): EEOC Complaint

A Public Employee Performance Evaluation (Government Code Section 54957):

Title: General Manager

B Conference with Labor Negotiators (Government Code Section 54957.6):

Agency Designated Representatives: Las Virgenes Municipal Water District Board of Directors

Unrepresented Employee: General Manager

The Board recessed to Closed Session at **6:21 p.m.** and reconvened to Open Session at **6:44 p.m.**

For the added Closed Session Item related to Anticipated Litigation, District Counsel Wayne Lemieux reported that the Board authorized the General Manager and District Counsel to proceed.

There was no reportable action for Closed Session Item 13A.

For Closed Session Item 13B, Director Caspary moved to authorize the Board President to sign an amendment to the General Manager's employment agreement reflecting a salary of $280,000 annually, effective at the beginning of the next pay period. Motion seconded by Director Polan. Motion carried by the following vote:

AYES: Caspary, Peterson, Polan, Renger
NOES: None
ABSTAIN: None
ABSENT: Lewitt

14. OPEN SESSION AND ADJOURNMENT

Seeing no further business to come before the Board, the meeting was duly adjourned at **6:45 p.m.**

GLEN PETERSON, President
Board of Directors
Las Virgenes Municipal Water District

ATTEST:

JAY LEWITT, Secretary
Board of Directors
Las Virgenes Municipal Water District

(SEAL)

June 26, 2018 LVMWD Regular Board Meeting

TO: Board of Directors

FROM: Finance & Administration

Subject : Request to Award Annual Purchase Orders

SUMMARY:

Annual purchase orders provide staff with flexibility when responding to operation and maintenance related matters that are of a routine and frequent nature.

RECOMMENDATION(S):

Authorize the General Manager to issue annual purchase orders, in the specified amounts, to the vendors listed in Table 1 below for the period of July 1, 2018 through June 30, 2019; and authorize a 45-day extension, in the additional amount of $6,000, for an existing purchase order with Vince Barnes Automotive.

FISCAL IMPACT:

Yes

ITEM BUDGETED:

Yes

FINANCIAL IMPACT:

The total cost of the purchase orders requiring Board approval is $318,000. The amounts are based on historical activity and projected business needs. Sufficient funds are available in the adopted Fiscal Year 2018-19 Budget.

DISCUSSION:

Maintenance, laboratory, construction and fleet functions require staff to be able to immediately select vendors who can respond to a variety of situations, including unexpected and

emergency work, throughout the year. Staff regularly seeks and screens for the most qualified and cost-effective vendors to provide the necessary services using the following criteria to evaluate potential vendors:

- Pricing
- Response time
- Capabilities and staffing
- Quality of services provided

The District's updated Purchasing Code calls for a competitive process at least once every five years for all annual purchase orders and contracts. Staff is accomplishing the objective over a five-year period that began in Fiscal Year 2016-17. Each year, 20% of the purchase orders from the original list are reviewed through a competitive process. After five years, all of the annual purchase orders, previously approved by the Board annually, will have been reviewed through a competitive process, and will continue to be reviewed at least once every five years. The list of purchase orders requiring Board approval for Fiscal Year 2018-19 totals $312,000.

A competitive process is currently underway for automobile service and maintenance. As a result, staff recommends a 45-day extension, in the additional amount of $6,000, to the existing purchase order with Vince Barnes Automotive, pending completion of the process. Upon selection of a new vendor, staff will recommend Board approval of the purchase order for automobile service and maintenance.

Below is a listing of the proposed vendors, purchase order amounts and a brief description of the service or material to be provided for the annual purchase orders requiring Board approval.

Table 1:

Supplier Name	Line Description	Amount
HACH COMPANY	Lab Instrumentation and Control	$ 85,000
WECK LABORATORIES, INC.	Lab Services	$ 65,000
CED CONSOLIDATED ELECTRICAL DIST	Electrical Supplies	$ 60,000
WEST COAST AIR CONDITIONING	HVAC Maintenance	$ 52,000
AQUATIC BIOASSAY & CONSULTING	Toxicity Testing, Bio Monitoring	$ 50,000
		$ 312,000

GOALS:

Ensure Effective Utilization of the Public's Assets and Money

Prepared by: Gretchen Bullock, Purchasing Supervisor

June 26, 2018 LVMWD Regular Board Meeting

TO: Board of Directors

FROM: Finance & Administration

Subject : Fiscal Year 2018-19 Salary Resolution: Adoption

SUMMARY:

Annually, the Board adopts a resolution establishing salary ranges for all District positions, effective for the following fiscal year. The attached Resolution No. 2537 establishes salaries effective July 1, 2018.

RECOMMENDATION(S):

Pass, approve and adopt Resolution No. 2537, establishing salaries for employees.

RESOLUTION NO. 2537

A RESOLUTION OF THE BOARD OF DIRECTORS OF LAS VIRGENES MUNICIPAL WATER DISTRICT ESTABLISHING SALARIES FOR EMPLOYEES

(Reference is hereby made to Resolution No. 2537 on file in the District's Resolution Book and by this reference the same is incorporated herein.)

FISCAL IMPACT:

Yes

ITEM BUDGETED:

Yes

FINANCIAL IMPACT:

Sufficient funds are included in the adopted Fiscal Year 2018-19 Budget for employee salaries.

DISCUSSION:

Annually, as part of the budget process, the Board adopts a resolution to document the salaries to be paid to District employees the following fiscal year. When the Board adopted the Fiscal Year 2018-19 Budget on May 22, 2018, a salary resolution was not included due to the timing of negotiations and need for approval of Memoranda of Understanding. The attached Resolution No. 2537 reflects salaries approved by the Board for all groups and employees through June 13, 2018.

GOALS:

Ensure Effective Utilization of the Public's Assets and Money

Prepared by: Donald Patterson, Director of Finance and Administration

ATTACHMENTS:

Proposed Resolution No. 2537

RESOLUTION NO: 2537

A RESOLUTION OF THE BOARD OF DIRECTORS OF LAS VIRGENES MUNICIPAL WATER DISTRICT ESTABLISHING SALARIES FOR EMPLOYEES

BE IT RESOLVED BY THE BOARD OF DIRECTORS OF LAS VIRGENES MUNICIPAL WATER DISTRICT as follows:

Section 1. Purpose and Scope

This resolution establishes salary levels for employees.

Section 2. General and Office Unit Classifications: Effective July 1, 2018

(a) Effective July 1, 2018, classifications in the General Unit and Office Unit shall be paid between the following starting and ending hourly salaries.

Classification	Starting Salary	Ending Salary
Account Clerk I	$19.997	$27.569
Account Clerk II	$22.309	$30.759
Accounting Technician	$25.392	$35.007
Buyer	$28.610	$39.446
Chief Water Treatment Plant Operator	$35.608	$49.099
Collections Systems Technician	$26.951	$37.163
Compliance Inspector	$28.610	$39.446
Computer Support Specialist	$28.610	$39.446
Cross Connection Inspector	$29.766	$41.042
Customer Service Representative	$23.658	$32.616
Electrical/Instrumentation Technician I	$28.045	$38.670
Electrical/Instrumentation Technician II	$32.884	$45.344
Facilities Inspector	$31.288	$43.141
Facilities Maintenance Worker	$21.440	$29.560
Field Customer Service Representative I	$21.229	$29.268
Field Customer Service Representative II	$23.447	$32.328
Fleet Technician	$28.045	$38.670
GIS Coordinator	$32.884	$45.344
Laboratory Assistant	$21.872	$30.156
Laboratory Technician I	$25.901	$35.711
Laboratory Technician II	$30.370	$41.874
Maintenance Mechanic I	$25.901	$35.711
Maintenance Mechanic II	$30.370	$41.874
Planning & New Development Technician	$30.669	$42.284
Receptionist/Office Assistant	$21.204	$29.237
Secretary	$25.088	$34.590
Senior Account Clerk	$23.682	$32.653
Senior Accounting Technician	$27.769	$38.288

Senior Electrical/Instrumentation Technician	$35.608	$49.099
Senior Field Customer Service Representative	$29.186	$40.238
Senior Maintenance Mechanic	$32.884	$45.344
Senior Water Distribution Operator	$34.219	$47.183
Senior Water Reclamation Plant Operator	$34.219	$47.183
Senior Water Worker	$29.186	$40.238
Storekeeper	$26.947	$37.156
Systems Coordinator	$32.884	$45.344
Technical Services Support Specialist	$27.494	$37.533
Water Reclamation Plant Operator I	$25.392	$35.007
Water Reclamation Plant Operator II	$31.602	$43.573
Water Reclamation Plant Operator in Training	$23.447	$32.328
Water Treatment Plant Operator II	$26.951	$37.163
Water Treatment Plant Operator III	$30.978	$42.715
Water Worker I	$21.229	$29.268
Water Worker II	$23.447	$32.328
Water Worker III	$26.951	$37.163

(b) Whenever possible, personnel will be hired at the above listed starting salary. With the approval of the General Manager, advanced step placement is possible to recruit an exceptionally well qualified candidate or to complete a difficult recruitment. Employees will be subject to annual merit review for possible increases.

Section 3. Supervisor, Professional & Confidential Unit Classifications: Effective July 1, 2018

(a) Effective July 1, 2018, classifications in the Supervisor, Professional & Confidential Unit shall be paid between the following starting and ending hourly salaries.

Classification	Starting Salary	Ending Salary
Administrative Services Coordinator	$43.222	$56.188
Assistant Engineer	$41.533	$53.993
Associate Engineer	$47.271	$61.452
Chief Water Reclamation Plant Operator	$45.425	$59.052
Civil Engineering Assistant	$39.128	$50.867
Civil Engineering Associate	$47.271	$61.452
Compost Operations Supervisor	$43.222	$56.188
Construction Supervisor	$43.222	$56.188
Customer Service Operations Supervisor	$43.222	$56.188
Customer Service Program Supervisor	$43.222	$56.188
Electrical/Instrumentation Supervisor	$43.222	$56.188
Environmental Analyst I	$34.041	$44.253
Environmental Analyst II	$39.518	$51.373
Facilities Maintenance Supervisor	$43.222	$56.188

Financial Analyst	$43.222	$56.188
Human Resources Analyst I	$34.041	$44.253
Human Resources Analyst II	$39.518	$51.373
Junior Engineer	$36.495	$47.443
Laboratory Supervisor	$45.425	$59.052
Management Analyst I	$34.041	$44.253
Management Analyst II	$39.518	$51.373
Public Affairs Associate	$41.950	$54.535
Purchasing Supervisor	$34.041	$44.253
SCADA Analyst	$41.533	$53.993
Senior Accountant	$39.518	$51.373
Senior Engineer	$51.052	$66.367
Systems Analyst	$42.792	$55.630
Technical Services Support Supervisor	$43.222	$56.188
Water Conservation Coordinator	$43.222	$56.188
Water Systems Supervisor	$43.222	$56.188

(b) Starting and ending figures establish pay limits with no fixed intermediate steps. Movement of an employee between the figures shall be based on performance and in accordance with the Unit's collective bargaining agreement.

Section 4. Management Unit Classifications: Effective July 1, 2018

(a) Effective July 1, 2018, classifications in the Management Unit shall be paid between the following starting and ending hourly salaries.

Classification	Starting Salary	Ending Salary
Executive Assistant/Clerk of the Board	$44.529	$62.340
Customer Services Manager	$52.734	$73.828
Finance Manager	$52.734	$73.828
Information Systems Manager	$55.424	$77.593
Principal Engineer	$57.104	$79.945
Public Affairs & Communications Manager	$52.734	$73.828
Resource Conservation Manager	$52.734	$73.828
Water Reclamation Manager/Engineer	$57.104	$79.945
Water Systems & Facilities Manager	$57.104	$79.945

(b) Starting and ending figures establish pay limits with no fixed intermediate steps. Movement of an employee between the figures shall be based on performance and in accordance with the Unit's collective bargaining agreement.

Section 5. Unrepresented Classifications: Effective July 1, 2018

(a) Effective July 1, 2018, classifications that are unrepresented shall be paid between the following starting and ending hourly salaries.

Classification	Starting Salary	Ending Salary
Director of Facilities & Operations	$69.423	$105.938
Director of Finance & Administration	$69.423	$105.938
Director of Resource Conservation & Public Outreach	$69.423	$105.938
Human Resources Manager	$55.424	$78.370

(b) Starting and ending figures establish pay limits with no fixed intermediate steps. Movement of an employee between the figures shall be based on performance and with the approval of the General Manager.

Section 6. Employment Contract Positions

(a) The General Manager position will be paid in accordance with a signed and approved employment contract to be amended by the Board as deemed necessary.

Classification	Hourly Rate	Annual Salary
General Manager	$134.615	$280,000

Section 7. Temporary Positions

(a) Temporary positions are not eligible for benefits other than salary; and temporary part-time positions shall be paid in accordance with the type of work performed.

(b) Student Workers shall be paid in accordance with the current California Minimum Wage.

(c) Interns:
  (1) Upper division candidates for Bachelor degree programs shall be paid $14.00 to $18.00 per hour.
  (2) Candidates for Master degree programs shall be paid $16.00 to $20.00 per hour.
  (3) Candidates for Doctoral degree programs shall be paid $16.00 to $22.00 per hour.

PASSED, APPROVED AND ADOPTED this 26th day of June 2018.

Glen Peterson, President

ATTEST:

Jay Lewitt, Secretary

APPROVED AS TO FORM:

W. Keith Lemieux
Olivarez Madruga Lemieux and O'Neill
District Counsel

(SEAL)

June 26, 2018 LVMWD Regular Board Meeting

TO: Board of Directors

FROM: Facilities & Operations

Subject : Pure Water Demonstration Project: Equipment Procurement

SUMMARY:

Staff proposes to pre-select and procure the treatment equipment for the Pure Water Demonstration Project to allow for final design of the project to be based on the selected equipment configuration and to reduce costs by eliminating the contractor markup for equipment. The treatment equipment consists of modules for ultrafiltration/nanofiltration (UF/NF), reserves osmosis (RO) and ultraviolet light/advanced oxidation (UV/AOP), at an estimated cost of $560,000.

The Las Virgenes Municipal Water District Code requires that goods included in the current budget and costing over $35,000 be purchased using a formal bidding process. Formal bidding requires the development of specifications that are advertised and open to bid by any firm that believes it can meet the requirements of the specifications. Informal bidding also involves the development of specifications, but only select vendors are invited to submit bids. Both bidding processes are competitive in nature.

The treatment equipment for the demonstration project will be unique in a variety of ways that make the use of an informal bidding process most appropriate. The equipment will be unique in size and flowrates, must be flexible to allow for testing, have a proven record of performance and available on a short schedule for project completion. Based on Carollo Engineers' experience, there are a limited number of firms that can provide the equipment for use in the proposed demonstration project.

As a result, staff recommends that formal bidding be waived and informal bidding be used for procurement of the treatment equipment for the project.

RECOMMENDATION(S):

Waive the formal bidding requirement and authorize an informal, competitive process for procurement of the treatment equipment for the Pure Water Demonstration Project.

FISCAL IMPACT:

No

ITEM BUDGETED:

Yes

FINANCIAL IMPACT:

There is no financial impact associated with waiving the formal bidding requirement. A sufficient number of firms will be invited to submit bids on the equipment such that the District obtains competitive pricing.

DISCUSSION:

The treatment equipment for the Pure Water Demonstration Project is estimated to cost $560,000. The Las Virgenes Municipal Water District Code requires that goods included in the current budget and costing over $35,000 be purchased using a formal bidding process. Formal bidding requires the development of specifications that are advertised over a two-week period and open to any firm that believes it can meet the requirements of the specifications. Informal bidding also involves the development of specifications but only select vendors are invited to submit bids. There is often a fair amount of clarification of the specifications during informal bidding, allowing for flexibility in defining the goods.

The UF/NF, RO and UV/AOP equipment for the demonstration project will be unique in the following ways:

- Size: The equipment will need to be sized to fit in Building No. 1, while still providing enough flow for testing and training.
- Flexibility: The equipment, in particular the UF/NF process, will need to be flexible so different equipment, manufacturers and operating modes can be tested.
- Proven Performance: The equipment will need to have a proven record of quality performance, so the testing is valid and rigorous to comply with the requirements of the U.S. Bureau of Reclamation (BOR) grant.
- Current Technology: The equipment will need to use current technology, so operator training is based on current technology, in particular instrumentation and controls.
- Schedule: The completion date for the demonstration project is December 2019 in the BOR grant and mid-May 2019 in the TMDL Implementation Plan, so a shortened procurement time is necessary.

Based on unique aspects of the equipment and the short schedule, staff recommends that formal bidding be waived and informal bidding be used for procurement of the treatment equipment for the demonstration project. Any purchase agreement for equipment will be submitted for approval by the Board. This action is solely for the purchase of equipment, not installation or other construction services. These services will be procured as required by the Las Virgenes Municipal Water District Code and applicable laws.

Carollo Engineers, the firm hired to design the demonstration project, recommends that treatment equipment bids be solicited from the following firms:

1. Ultrafiltration/Nanofiltration
    a. Biwater
    b. H2O Innovations
    c. WesTech Engineering, Inc.
2. Reverse Osmosis
    a. Biwater
    b. Harn
    c. H2O Innovations
3. Ultraviolet/Advanced Oxidation Process
    a. Trojan UV
    b. Wedeco/Xylem, Inc.
    c. Calgon Carbon Corporation

GOALS:

Lead in Sanitation and Recycled Water Services Focusing on Maximum Reuse

Prepared by: David R. Lippman, P.E., Director of Facilities and Operations

June 26, 2018 LVMWD Regular Board Meeting

TO: Board of Directors

FROM: Facilities & Operations

Subject : Tapia SCADA System Upgrade: Request for Proposals

SUMMARY:

The District uses a Supervisory Control and Data Acquisition (SCADA) system for its wastewater treatment, potable water and recycled water enterprises. The SCADA system provides automation of processes, alarm protocol, data collection for analysis and reporting, and remote control and monitoring of processes and equipment. The SCADA network includes field instruments, programmable logic controllers (PLC), a communication network, and a human machine interface (HMI).

Most of the PLCs installed at the Tapia Water Reclamation Facility and for the water systems are obsolete and no longer available or supported by the manufacturer. The District's current HMI is also obsolete and cumbersome due to its age and modifications that have been made over time. An Ovation Distributed Control System (DCS) was installed at the Rancho Las Virgenes Composting Facility, and the system currently remains fully functional with sufficient available parts and support.

Due to obsolescence of the existing PLCs and HMI for Tapia and the water systems, staff has been planning an upgrade of the SCADA system through a phased approach that would begin with Tapia. Standardization of the PLCs and HMI across the enterprises would provide consistency in equipment and programming and allow staff to focus on specific training and skill sets. To select a standard platform, four PLC/HMI platforms were evaluated taking into consideration the following factors: reliability, life-cycle cost, ease of use, ease of integration and availability of long-term support. Three systems were very close in rating and life-cycle cost. The fourth system had the lowest rating because it has yet to be deployed and had the highest life-cycle cost.

In the mid 1990s, the District had trouble with proprietary software and hardware used to control its SCADA systems. As a result, the District implemented the Wonderware InTouch SCADA software as its HMI and Historian to communicate with all of the different PLCs installed throughout the system, eventually standardizing on the use of Modicon PLCs.

With the exception of the Emerson Ovation system, all of the platforms were very close in ratings and life-cycle cost; however, the two platforms using the Wonderware HMI would provide a distinct advantage to the District by leveraging the investment already made in the earlier version of the Wonderware software.

Staff recommends issuing a request for proposals to develop plans and specifications for the Tapia SCADA system upgrade allowing the use of either Rockwell Automation PLCs with the Schneider Wonderware HMI or Schneider Modicon PLCs with the Schneider Wonderware HMI.

RECOMMENDATION(S):

Authorize the issuance of a Request for Proposals to develop plans and specifications for the Tapia SCADA system upgrade using either Rockwell Automation PLCs with the Schneider Wonderware HMI or Schneider Modicon PLCs with the Schneider Wonderware HMI.

FISCAL IMPACT:

No

ITEM BUDGETED:

Yes

FINANCIAL IMPACT:

There is no financial impact associated with issuing a request for proposals. The SCADA upgrades are proposed to be phased with Tapia planned for Fiscal Years 2018-20, the water and recycled water systems in Fiscal Years 2020-22, followed by the Westlake Filtration Plant in Fiscal Year 2022-23. Upgrading the SCADA system for the water system will also require an upgrade of the radio-based communication system. Sufficient funds are provided in the adopted Fiscal Years 2018-20 Two-Year Budget Plan for the SCADA system upgrade at Tapia.

DISCUSSION:

The District uses a SCADA system for all three of its enterprises: wastewater treatment, potable water and recycled water. The SCADA system provides automation of processes, alarm protocol, data collection for analysis and reporting, and remote control and monitoring of processes and equipment. Remote control and monitoring is particularly useful in the potable water system with its scattered sites and for stand-by staff who can remotely monitor the system and respond to alarms. Employees organized into four different stand-by shifts (Tapia, Rancho, the water system, and Westlake Filter Plant, when it is in operation) use laptop computers for remote monitoring and control of the systems. The stand-by shifts coupled with use of the SCADA system provide significant cost-savings to the District by avoiding the need for a second shift to provide 24-hour coverage.

The SCADA network includes field instruments, programmable logic controllers (PLC), a communication network, and a human machine interface (HMI). Tapia, Westlake, and the

water systems share a common SCADA platform using Modicon PLCs and the Wonderware InTouch HMI. At Rancho, an Ovation Distributed Control System (DCS) was installed when the plant was constructed. The system has been upgraded several times and remains fully functional.

Most of the PLCs installed at Tapia and for the water systems are obsolete and no longer available or supported by the manufacturer. The current HMI is also obsolete and cumbersome due to its age and modifications that have been made over time. The Ovation DCS at Rancho still has sufficient parts availability and support.

Due to obsolescence of the existing PLCs and HMI for Tapia and the water systems, staff has been planning an upgrade of the SCADA system through a phased approach that would begin with Tapia. Standardization of the PLCs and HMI across the enterprises would provide for consistency in equipment and programming and allow staff to focus on specific training and skill sets. Cannon Consultants assisted staff to perform an evaluation of the following four PLC/HMI platforms:

- Rockwell Automation PLCs/Rockwell Automation HMI
- Rockwell Automation PLCs/Schneider Wonderware HMI
- Schneider Modicon PLCs/Schneider Wonderware HMI
- Emerson Ovation OC100

The evaluation considered the following four criteria: operational function and reliability, life-cycle cost, ease of use and integration and availability of long-term support. Importance factors of five, four and three, respectively, were assigned to each criteria, which were then rated on a scale of 1 to 10 with 10 being the highest or best rating. The importance factor and rating were multiplied for a point total with a maximum of 150 points possible. The results were as follows:

Platform	Total Points
Rockwell Automation PLC/Rockwell Automation HMI	118.75
Rockwell Automation PLC/Schneider Wonderware HMI	115.50
Schneider Modicon PLC/Schneider Wonderware HMI	114.43
Emerson Ovation OC100	89.75

As shown in the table above, the Rockwell Automation PLCs/Rockwell Automation HMI has the highest total points, closely followed by the Rockwell Automation PLCs/Schneider Wonderware HMI and Schneider Modicon PLCs/Schneider Wonderware HMI. The Emerson Ovation OC100 system had not yet been deployed, and only Emerson could provide programming and support services, resulting in the lowest total points. The Ovation platform had the highest life cycle cost, while the other three platforms had similar life cycle costs, as shown below.

Platform	Life Cycle Cost
Emerson Ovation OC100	$1,922,333
Rockwell Automation PLC/Rockwell Automation HMI	$1,668,610
Rockwell Automation PLC/Schneider Wonderware HMI	$1,658,410
Schneider Modicon PLC/Schneider Wonderware HMI	$1,556,925

The Rockwell Automation PLCs/Rockwell Automation HMI platform had the highest point total and second highest life cycle cost. This platform is a fully integrated system that has proven to be highly reliable, and Rockwell Automation provides excellent long-term support. However, if this platform was implemented at Tapia and the conversion of the water systems did not proceed, the District would be left with three different SCADA platforms to manage and maintain. As a result, this platform is not recommended.

In the mid 1990s, the District had trouble with the proprietary software and hardware used to control its SCADA systems. As a result, the District adopted the Wonderware InTouch SCADA software as its HMI and Historian to communicate with all of the different PLCs installed throughout the system, eventually standardizing on Modicon PLCs.

The Rockwell Automation PLCs/Schneider Wonderware HMI platform would leverage the reliability and support of Rockwell Automation, while continuing the use of Wonderware for the HMI. The Schneider Modicon PLCs/Schneider Wonderware HMI platform would also continue the use of Wonderware for the HMI with Modicon PLCs, which are very similar to the Rockwell PLCs based on the evaluation.

All the platforms, with the exception of the Emerson Ovation platform, were very close in ratings and life-cycle cost; however, the two platforms using the Wonderware HMI would leverage the investment the District has already made in the software. The Wonderware Intouch System is a tag-based system, and Wonderware's latest system, called System Platform, is an object-oriented system. As a part of the upgrade, the HMI would be upgraded to the object-oriented system.

Staff recommends issuing a request for proposals to develop plans and specifications for the Tapia SCADA system upgrade using either Rockwell Automation PLCs with the Schneider Wonderware HMI or Schneider Modicon PLCs with the Schneider Wonderware HMI.

Attached for reference is a copy of the SCADA Evaluation Technical Report.

GOALS:

Provide Safe and Quality Water with Reliable Services

Prepared by: David R. Lippman, P.E., Director of Facilities and Operations

ATTACHMENTS:

SCADA Evaluation Technical Report

May 25, 2018

Mr. Eric Schlageter
Senior Engineer
Las Virgenes Municipal Water District
4232 Las Virgenes Road
Calabasas, CA 91302

PROJECT: LAS VIRGENES MUNICIPAL WATER DISTRICT - SCADA EVALUATION

Dear Mr. Schlageter:

Las Virgenes Municipal Water District (LVMWD or District) selected Cannon to conduct a SCADA evaluation of the hardware and software implemented at the LVMWD water and wastewater systems. Currently, the District's water and wastewater systems have a variety of manufacturers and ages of equipment. The outcome of this evaluation will give the District an objective report for selecting the future PLC and HMI platforms. This report is a result of investigation, collaboration with the District, collaboration with vendors, and Cannon's experience with industry best practices and municipal water/wastewater SCADA systems.

The goal of this report is to provide an objective conclusion for standardization and modernization of the District's SCADA systems to provide high reliability, best life-cycle cost, and ease of support for long-term maintenance and expansion.

This report focuses on our findings and the technical data collected during site investigations. The embedded documentation details our evaluation of the different vendors' options for the District's SCADA system. We used a decision matrix to appropriately weight and objectively compare the four major criteria identified by the District in the kickoff meeting and evaluation workshop.

Within the attached document our project understanding and approach explains how we reached the conclusion to our evaluation. I will follow up with you soon about this evaluation. Please feel free to contact me if you would like to further discuss our findings, or if you have any questions about the content of this report.

Sincerely,

David Dutcher, PE
Sr. Principal Controls Engineer
Automation & Electrical Division

Table of Contents

Common Acronyms and Abbreviations

CIP	Common Internet Protocol
DCS	Distributed Control System
DHS	Department of Homeland Security
HMI	Human Machine Interface
IC	Interconnect
ICS-CERT	Industrial Control Systems - Cyber Emergency Response Team (part of DHS)
IDE	Integrated Development Environment
I/O	Input/output
IP	Internet Protocol
LS	Lift Station
MCC	Motor Control Center
MTBF	Mean Time Between Failures
OIT	Operator Interface Terminal
OFS	OPC Factory Suite
OLE	Object Linking and Embedding
OPC	OLE for Process Control
PLC	Programmable Logic Controller
SCADA	Supervisory Control and Data Acquisition
SOE	Sequence Of Events
SQL	Structured Query Language
SSRS	SQL Server Reporting Services
TCP	Transmission Control Protocol
UPS	Uninterruptible Power Supply
VM	Virtual Machine
VPN	Virtual Private Network

1. Project Understanding & Approach

LVMWD has a variety of automation infrastructure (i.e. Supervisory Control and Data Acquisition, SCADA) deployed at numerous water, wastewater, and composting facilities. Many of the programmable logic controllers (PLCs) embedded within these facilities are obsolete with no reasonable way to support the infrastructure for the future. To achieve a modern technology and standardized solution, your team requested an evaluation of the current PLC and HMI infrastructure and recommendations for the best available options for upgrading the system. This report provides an analysis and evaluation along with recommendations that will help your team make an informed decision about your future automation infrastructure.

The Tapia wastewater plant has the most pressing needs for SCADA system upgrades, as this site has the highest number of obsolete PLC hardware. The Water Ops facilities also have aging PLC and HMI hardware, but have different technical requirements based on the number of remote sites and the limited functions at each site. This report focused on finding not just gaps at the Tapia facility but gaps across the different facilities, as the final decision must be a common platform for all of the different operations.

Based on our discussions with your team, one of the most significant decisions involves the selection of a reliable and cost-effective PLC platform. Your facilities currently have an installed-base of Modicon PLCs and Ovation DCS (at the Rancho composting facility). The SCADA evaluation is not limited to PLC infrastructure, as the HMI functionality has significant impact to how the Operations team interacts with the control system and field devices. Your facilities currently have an installed-base of Wonderware InTouch HMI and Ovation DCS (only at the Rancho composting facility) for its HMI components.

Based on input from your team, the major SCADA and PLC vendors that were considered as part of this SCADA evaluation were:

- Schneider Modicon PLC / Schneider Wonderware HMI
- Rockwell Automation PLC / Schneider Wonderware HMI
- Rockwell Automation PLC / Rockwell Automation HMI
- Emerson Ovation

We included a hybrid solution in the evaluation after feedback from your team and comparison with industry experience. The installation base of SCADA systems with a combination of Rockwell Automation and Wonderware is well represented in California across water and wastewater systems.

The purpose of this report is to help LVMWD objectively select a SCADA platform from the vendors identified above. Although this evaluation will factor in the existing SCADA infrastructure, the primary decision points will focus on the following:

1. Reliability
    a. Low maintenance and high availability
    b. Reliability of hardware and software
    c. Standardized functionality
2. Life-cycle costs
    a. Initial replacement and installation costs
    b. On-going operational, maintenance and support costs
3. Ease of use and integration
    a. Ease of hardware implementation
    b. Ease of software programs, tools, and implementation
4. Long-term support
    a. Consideration for obsolescence and migration across products/platforms
    b. Vendor reliability and depth of technical support

As part of our analysis and evaluation, we worked with your team to conduct a field investigation of many of the representative sites for the water, wastewater and composting facilities. We leveraged both our investigation findings and the hardware/software inventory created by your staff to serve as the basis for the evaluation and recommendations.

We also investigated current challenges and limitations with the existing system. We identified both the most important functionality to retain and the functionality requested for any future platform. We conducted one workshop with your team during which we honed in on key criteria to evaluate the SCADA system vendor solutions against the District priorities.

We worked with each of the three identified vendors to establish a common SCADA architecture and basis for product offerings. This SCADA architecture will meet the needs and criteria identified during this workshop. We evaluated current market pricing for installation and projected 10-year operational costs.

Additionally, we included an eye toward cybersecurity in our evaluation. We did not include this as one of the decision criteria, per our workshop with your team, but we did evaluate if the vendor products provided an adequate level of security integrated with the hardware/software offerings.

Finally, we summarized the results of our field investigations, workshops and evaluation process in Sections 2 and 3, and provide conclusions and recommendations in Section 4.

As follow-on to this report, your team will need to take steps to create SCADA standards, which will leverage the functionality of the selected vendor's PLC/HMI platforms. For example, the selected vendor platform will provide capability to create global templates for PLC and HMI programs. Your team will define and own these templates for all future installations.

2. Existing Infrastructure

2.1 Tapia Wastewater Plant (WWTP)

Our investigation determined that a majority of the PLCs at the Tapia wastewater facility were Modicon 984 series controllers, which have been obsolete for many years. Additionally, we noted that many of the processors were co-located in a close proximity to each other. In several cases, the PLCs are in adjacent control panels within the same MCC or electrical room.

The existing plant fiber optic infrastructure is for the Modbus Plus network. The fiber optic network extends to every PLC node within the plant and all the SCADA client workstations. This fiber optic network distribution will be helpful for future upgrades. As your team upgrades the PLC hardware to use Ethernet IP communications, the plant can re-purpose the fiber optic network for Ethernet communications between the PLCs and SCADA servers.

The existing SCADA software is a managed Wonderware InTouch application with one main Data Acquisition Server (DAS) located in the Tapia main administration building. There are three Dell servers of varying ages (likely 2-4 years old) located in a server rack adjacent to the control room. In addition to the DAS server, a Historian server and Terminal Server are located in this same server rack. Your team uses Terminal Services for all the SCADA workstations, including Lift Station #1 and #2, which are remote sites. This approach is strategic and allows for standard workstations to run SCADA applications without installing Wonderware software on every workstation. Additionally, this approach leverages the fiber optic network backbone within the plant and extends out to the Lift Stations.

Tables 2.1, 2.2, and 2.3 identify the number and location of the site PLCs and the requirements for replacement.

Table 2.1 – Tapia WWTP PLCs for Replacement

PLC Number	Location on Site	PLC Processor	Requires Replacement?
95	Centrate	984-E275	Y
96	Centrate	Quantum	Y
97	Centrate	Momentum	Y *
97	Centrate	AB	N
5	Chemical	984-E275	Y
25	Chemical	984-E285	Y
37	Chemical	Momentum	Y *
38	Chemical	Momentum	Y *
39	Chemical	Momentum	Y *
6	Control	984-E275	Y
2	CP100	984-E285	Y
33	CP100	984-E285	Y
34	CP100	Quantum	Y
35	CP100	984-E285	Y
1	CP1000	984-E275	Y
7	CP1000	984-E275	Y
9	CP1000	984-E275	Y

29	CP1000	984-E285	Y
36	CP1000	Momentum	Y *
3	Effluent	984-E275	Y
41	Effluent PS	Momentum	Y *
4	Filters	984-E275	Y
10	Filters	984-E275	Y
11	Filters	984-E275	Y
12	Filters	984-E275	Y
13	Filters	984-E275	Y
14	Filters	984-E275	Y
15	Filters	984-E275	Y
16	Filters	984-E275	Y
17	Filters	984-E275	Y
18	Filters	984-E275	Y
19	Filters	984-E275	Y
20	Filters	984-E275	Y
21	Filters	984-E275	Y
22	Filters	984-E275	Y
8	Force Main 2	984-E285	Y
26	Headworks	984-E275	Y
27	Headworks	984-E265	Y
28	Headworks	984-E265	Y
23	Lift Station 1	984-E285	Y
41	Lift Station 1	Momentum	Y *
24	Lift Station 2	984-E285	Y
42	Lift Station 2	Momentum	Y *

* Schneider Modicon vendor has recommended that Momentum processors do not require complete replacement, but a simple replacement of the “top hat” module, which will upgrade the PLC to use the Unity Pro software application while utilizing the existing I/O terminal base.

2.2 Water Operations Sites (Ops)

We conducted site investigations at representative sites to better understand the infrastructure at typical water operations sites, the type of functions represented, and the method of communication to a central location. We opted to not investigate all of the sites, since your staff indicated that there is a high degree of similarity across most of the sites.

The water operations sites communicated data primarily to the main SCADA server at the Operations Building at the LVMWD main facility. There is a secondary connection to the Westlake Filter Plant facility. The water operations SCADA system includes both Potable and Reclaim water facilities.

The existing communication infrastructure consists of a combination of fiber optic networks to the main “hubs” within the water system and serial radio telemetry from these hubs to the remote sites.

The existing SCADA software is a managed Wonderware InTouch application with one main Data Acquisition Server (DAS) located in the District main administration building. There are three Dell servers of varying ages (likely 3-5 years old) located in a server rack adjacent to the control room. In addition to the DAS server, a Historian server and Terminal Server are located in this same server rack. Your team uses Terminal Services for all several key water hubs where the fiber optic network backbone is extended. The selected hubs smartly correlate to the water system hydraulics, such that sites which are most critical to system hydraulics are on the fiber optic network.

Table 2.2 – Water Operations PLCs for Replacement

PLC Number	Location on Site	System	PLC Processor	Requires Replacement?
205	3 Springs PS	Potable	984-E275	Y
205	3 Springs PS	Potable	Momentum	Y *
203	Agoura PS	Potable	984-E275	Y
203	Agoura PS	Potable	Momentum	Y *
204	Argos Valve	Potable	Momentum	Y *
176	Calabasas Tank	Potable	Momentum	Y *
114	Cold Canyon PS	Potable	984-E275	Y
114	Cold Canyon PS	Potable	Momentum	Y *
154	Conduit PS	Potable	984-E275	Y
154	Conduit PS	Potable	Momentum	Y *
202	Cornell PS	Potable	984-E275	Y
175	Dardenne PS	Potable	984-E275	Y
228	Equestrian Tank	Potable	Momentum	Y *
224	JBR PS	Potable	984-E275	Y
224	JBR PS	Potable	Momentum	Y *
107	Jed Smith PS	Potable	984-E275	Y
107	Jed Smith PS	Potable	Momentum	Y *
106	Jed Smith Tank	Potable	Momentum	Y *
223	Kimberly PS	Potable	984-E275	Y
223	Kimberly PS	Potable	Momentum	Y *
222	Kimberly Tank	Potable	Momentum	Y *
92	Latigo Tank	Potable	Momentum	Y *
134	Lower Oaks PS	Potable	984-E275	Y
135	Lower Oaks Tank	Potable	Momentum	Y *
163	LV1 Flowmeter	Potable	Momentum	Y *
15	LV2 PS	Potable	984-E275	Y
108	McCoy PS	Potable	984-E275	Y
110	McCoy Tank	Potable	Momentum	Y *
226	Morrison Tank	Potable	Momentum	Y *
105	Morrison PS	Potable	984-E275	Y
179	Mulwood PRV	Potable	Momentum	Y *
174	Mulwood PS	Potable	984-E275	Y

173	Mulwood Tank	Potable	Momentum	Y *
178	Oakridge PS	Potable	984-E275	Y
209	Ramera Ridge Valve	Potable	Momentum	Y *
136	Ranchview PS	Potable	984-E275	Y
113	Saddlepeak Tank	Potable	Momentum	Y *
229	Saddletree PS	Potable	984-E275	Y
229	Saddletree PS	Potable	Momentum	Y *
227	Saddletree Tank	Potable	Momentum	Y *
208	Seminole PS	Potable	984-E275	Y
208	Seminole PS	Potable	Momentum	Y *
207	Seminole Tank	Potable	Momentum	Y *
112	Stunt Road PS	Potable	984-E275	Y
162	Twin Lakes PS	Potable	984-E275	Y
164	Twin Lakes Tank	Potable	Momentum	Y *
133	Upper Oaks PS	Potable	984-E275	Y
209	Upper Oaks Tank	Potable	Momentum	Y *
156	Upper Twin Lakes PS	Potable	984-E275	Y
153	Warner PS	Potable	984-E275	Y
153	Warner PS	Potable	Momentum	Y *
172	Warner Tank	Potable	Momentum	Y *
206	Westlake PRV	Potable	Momentum	Y *
155	Woolsey Tank	Potable	Momentum	Y *
177	005 Flowmeter	Reclaim	Momentum	Y *
2	Cordillera Reservoir	Reclaim	984-145	Y
231	County Line Flow	Reclaim	Momentum	Y *
103	Indian Hills Tank	Reclaim	Momentum	Y *
232	Morrison PS	Reclaim	984-E275	Y
225	Oakpark PS	Reclaim	984-E275	Y
136	Parkway PS	Reclaim	984-E275	Y
104	Reservoir 3	Reclaim	Momentum	Y *
1	RWPS	Reclaim	984-E275	Y
230	Westlake Wells	Reclaim	984-E275	Y
230	Westlake Wells	Reclaim	Momentum	Y *

* Schneider Modicon vendor has recommended that Momentum processors do not require complete replacement, but a simple replacement of the “top hat” module, which will upgrade the PLC to use the Unity Pro software application while utilizing the existing I/O terminal base.

2.3 Westlake Filter Plant

Our investigation determined that a majority of the PLCs at the Westlake Filter Plant were Modicon 984 model controllers, which have been obsolete for some time. This plant does have a few newer Modicon M340 PLCs using Unity Pro application in the Filter Room.

The existing plant infrastructure allows for both Ethernet and Modbus Plus networking. The physical size of the plant is limited; therefore, the PLC panels are all in close physical proximity. As your team upgrades the PLC hardware to use Ethernet IP communications, the plant can re-purpose the fiber optic network for Ethernet communications between the PLCs and SCADA servers.

The existing SCADA software is a managed Wonderware InTouch application with one main Data Acquisition Server (DAS) located in the Westlake Filter Plant main administration building. There are two Dell servers of varying ages (likely 2-4 years old) located in a server rack adjacent to the control room. In addition to the DAS server, a Historian server and Terminal Server are located in this same server rack. Your team uses Terminal Services for all the site workstations, including several of the "hub" locations within the water system.

Table 2.3 – Water Operations PLCs for Replacement

PLC Number	Location on Site	PLC Processor	Requires Replacement?
23	Plant	E984-285	Y
11	Filter 1	E984-275	Y
12	Filter 2	E984-275	Y
13	Filter 3	E984-275	Y
14	Filter 4	E984-275	Y
15	Filter 5	E984-275	Y
16	Filter 6	E984-275	Y
17	Filter 7	E984-275	Y
18	Filter 8	E984-275	Y
19	Filter 9	E984-275	Y
20	Filter 10	E984-275	Y
21	Filter 11	M340	N
22	Filter 12	M340	N
25	LCP 25 - Chemical	E294-285	Y
26	LCP 26 -	E294-285	Y
27	LCP 27 - Torchwood Tank	Momentum	Y *
14A	RTU - 14A - Pump Station	M340	N

* Schneider Modicon vendor has recommended that Momentum processors do not require complete replacement, but a simple replacement of the "top hat" module, which will upgrade the PLC to use the Unity Pro software application while utilizing the existing I/O terminal base.

2.4 Rancho Composting Facility

Your management team specifically noted that the Rancho Composting Facility would not be subject to upgrade based on the recommendation of this evaluation. However, Emerson Ovation is one of the considered SCADA platforms for this evaluation, so we conducted site investigations to understand the Ovation infrastructure and how the District implemented the DCS at this facility.

The Ovation system uses five main controller cabinets distributed in each building within the facility. These controllers are all the OCR-400 series controllers. Each controller has a redundant pair and redundant network components for communication to the control room.

Your staff noted that recent requests for support for this facility were met with extremely costly estimates. In the kickoff meeting and workshop, we noted District concerns about the long-term costs with the Ovation DCS system.

The existing plant communication infrastructure uses fiber optic network which uses a proprietary bus communication between the main DCS servers and the controller cabinets.

2.5 Existing Hardware/Software Reliability

2.5.1 Redundancy & Failure Points

Your team's approach to the various systems is simple regarding hardware redundancy. The main approach for redundancy is to have a shelf-spare for the critical nodes within the system. This is problematic for the sites that have obsolete controllers and creates risk for the District, as they have a very limited number of replacement components.

Your staff has done a good job in tracking PLC applications for each site. Each site has a thumb drive in a sealed envelope with a tracking sheet for District staff or contractors to note changes. This approach allows for immediate access to the latest software application in the event of a hardware failure and replacement.

Figure 2-1 – Example Modbus Plus gateway module

The SCADA system relies upon three separate physical servers, so the functionality of the SCADA system is distributed across those servers.

For data to communicate between the existing Modicon PLCs and the SCADA system, the District uses specialized gateway modules, which convert from Modbus Plus to Modbus TCP. The District has found good success with these units and fortunately has had few issues limiting data monitoring and control, as this is a single-point of failure for the data communication to the PLCs.

2.5.2 Power & Backup Power

Most of the sites within the water system have generator backup options for power to the site and the PLC control panel. The District has standardized a simple and effective means for battery

backup using standard “off the shelf” car batteries, power chargers, and voltage. This approach has allowed your staff to maintain health in batteries and reduce costs.

Figure 2-2 – Water Operations panel with standard battery backup

2.5.3 Alarm Notification

In each SCADA server identified above, the District has implemented three different systems at each of the facilities:

- Tapia WWTP — Hardware redundant alarm dialer at PLC-6
- Westlake Filter Plant — Win911 alarm software, modem & dialer
- Water Operations — SCADAlarm 5.0 software, modem & dialer

The alarm notification is a call-out system to pre-selected list of operators. There is limited redundancy or fail-over capability in the system, so periodic checks of the system are required to validate alarm notification is operational.

Figure 2-3 – Water Operations SCADA server rack with external modem

2.6 Existing Telemetry & Networking

The District has invested in fiber optic throughout all of their SCADA system. In the case of the three main plants, this fiber optic network is the backbone for all communications. The use of fiber optic networks will pay dividends as your team can use this infrastructure for Ethernet communication in future upgrades.

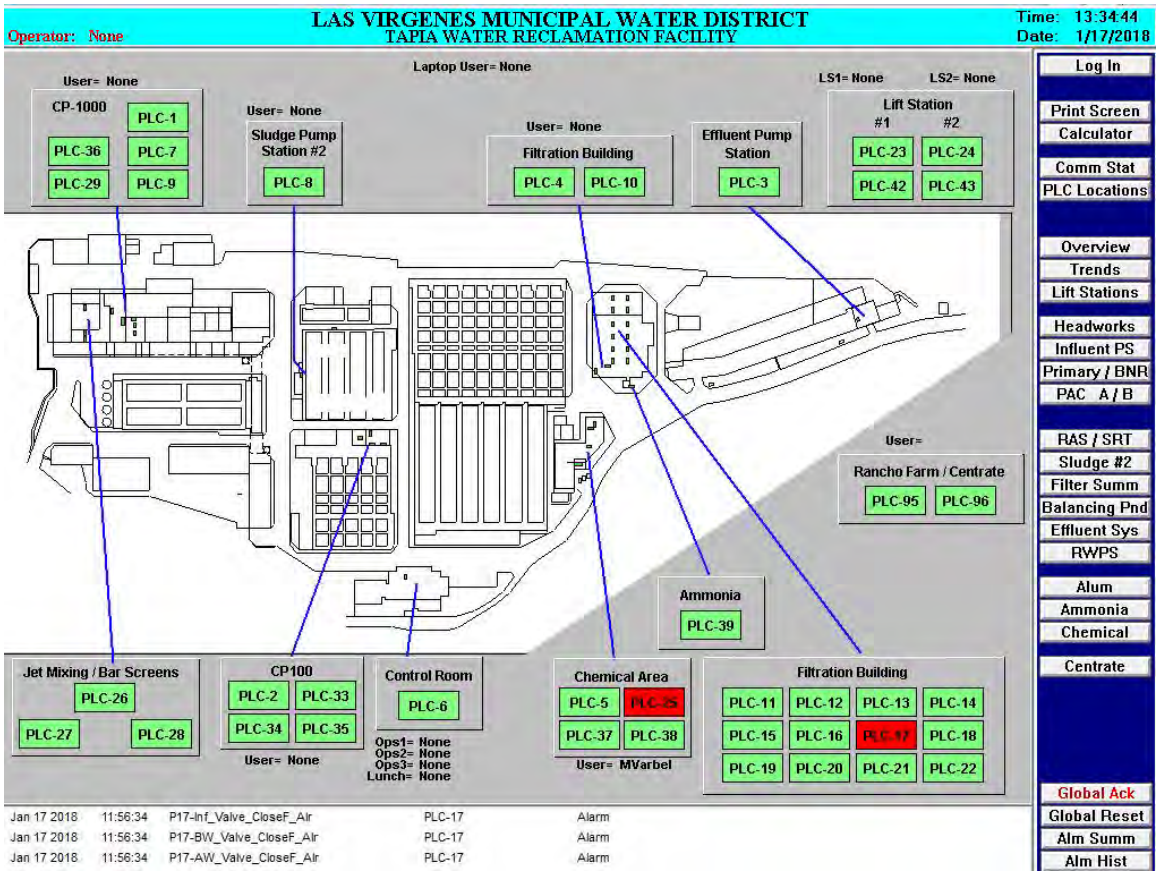

Figure 2-4 – Tapia WWTP SCADA Overview showing PLC locations

For the Water Operations sites, the combination of fiber optic infrastructure with serial radios allows for effective communication to the remote sites. The District uses GE MDS 9810 serial radios on the ISM bandwidth (902-928 MHz). The radios operate at 19,200 baud-rate, which is a low data bandwidth. These radios are obsolete, so there are limited spare parts to support radio failures. Your staff has noted that the radios have been robust and they have experienced limited failures with the telemetry/radio system. There are some limitations in the data bandwidth to the remote sites via serial radios, but your team uses smart techniques to limit the data throughput required.

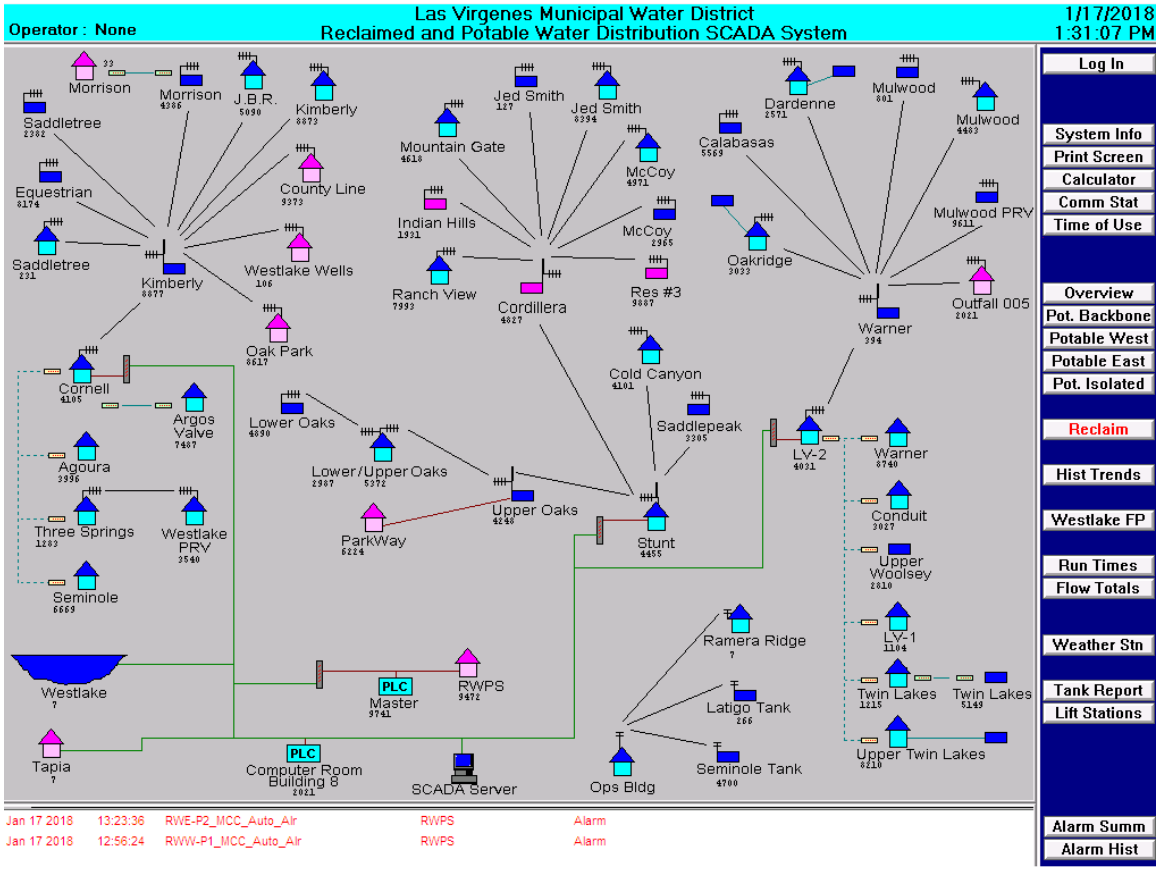

Figure 2-5 – Water Operations SCADA Overview showing telemetry

2.7 Evaluation Workshop

A significant part of the SCADA evaluation was conducting interviews of your team, ranging from operators, to maintainers, to managers. We directed a workshop to delve further into the system requirements and the attributes of the SCADA system that would be required for long-term success. Your team helped identify critical success factors for the

The following are the items that your team identified as positive functions that are working correctly in your current SCADA system. Your team identified these functions as critical to include/retain in the new SCADA system, regardless of vendor:

- HMI screen layouts are effective overviews, easy to use and allow for easy training of new operators. Overview has rough hydraulic and process layout.
- Ease of Alarm Notification or “Spotting a Problem” in the system. When an alarm is generated in the alarm banner, there is a shortcut to the exact HMI graphic in question. This helps operators “zero in” on the problem quickly.
- Common alarms exist for most items, so operators generally do not worry if they are not getting all the alarm status.
- Technicians and maintenance staff noted that spare capacity exists in the current system. Future PLC and HMI systems need to be built with spare capacity in mind.
- Connections from the SCADA system to Excel, Hach WIMS, or other user-friendly interface are very helpful for operators and managers.
- Your staff identified that trending tools are frequently used and very effective in analyzing the process and upset conditions.

From this evaluation workshop, we also identified areas for improvement to the existing SCADA system. The following are recommendations that were identified as areas for improvement for any future SCADA system, regardless of vendor:

- Recommend standardized logic and graphics, which will allow your team to better support and maintain your own processes and control system infrastructure.
    - Standardized, object-oriented blocks need to be the building blocks of the new system. This will ensure that a pump object will function and look the same across all the sites, leading to ease of troubleshooting and maintenance.
    - This will also reduce project costs when external integrators are required to support projects or upgrades.
- Recommend display of Process and System Interlocks for most processes and equipment
    - PLC programs currently have hard-coded interlocks, such that Operators cannot troubleshoot or resolve process upsets without programmer intervention, even for simple items. Interlocks need to be included on the HMI graphics.
    - Timing for PLC logic, such as start delays or alarm delays need to be included on the HMI graphics.
- Recommend the addition of better descriptors to tagging, alarms, and other displays so that “layman” or junior operator can understand the graphics.
- Recommend improved reports or dashboard functions that can be customized for managers or operators.
- Recommend standardization of PLC hardware to match across Tapia, Westlake and Water Ops facilities, at a minimum.
    - This is ensure adequate shelf spare capacity without maintaining a large inventory.
- Recommend improved redundancy to reduce single-point-of-failure, where possible. This approach will be important for both hardware and software
    - Power issues seem to be the most prevalent regarding failures. Current approach to battery backups and power uses standard off-the-shelf car batteries which
- Recommend improved documentation per site and per SCADA system.
    - The current documentation is custom per site and difficult to find.
    - Your team understands that retroactive “as-built” documentation can be costly, but future implementation needs to include detailed documentation (electronically and hardcopy).

Based on this input, it was clear that regardless of PLC and HMI vendor selected, there is a significant upgrade of the SCADA system to incorporate the standardization of hardware, logic and graphics associate with each of the facilities. As a result, we included significant engineering and programming effort estimate in the initial cost comparisons.

3. SCADA Evaluation

3.1 Reliability

From the very beginning of this evaluation, it was clear that your team wanted to make the most reliable choice for a new SCADA platform. The chosen PLC/HMI hardware and software should provide reliability for the next 10 to 15 years. One of the biggest frustrations expressed in the kickoff and workshop meetings was the age of your current PLC hardware. A majority of Tapia WWTP and the Water operations sites are operating with obsolete PLC platforms. In order to get spare parts or maintain these systems, your staff has to resort to drastic measures.

For the District to improve reliability in the chosen SCADA system, they also must be less dependent on the vendors or system integrators. Your engineers and technicians want to take more ownership in the final SCADA solution, thus increasing their ability to support the control system into the future. To do this the hardware and software tools chosen must have ease of use, good standardization and have proven support.

3.1.1 Hardware Reliability

Reliability of the selected PLC hardware is a key issue for replacing the existing PLCs. We did not evaluate hardware reliability of off-the-shelf networking or computer components (such as network switches, computer workstations, servers, etc.) As a result, we focused the hardware reliability factor on the PLC/DCS vendor specific hardware, including PLC processors, I/O modules, PLC power supplies, etc.

We evaluated hardware reliability for the selected vendors based upon several factors:

- Installation base of selected replacement PLC hardware in the region
- Point in the lifecycle of the selected replacement PLC hardware
- Mean Time Between Failure (MTBF) for the selected PLC hardware
- Frequency of returns for the selected PLC hardware

We solicited input from each of the vendors regarding this data. Based on the responses from the vendors, we have a variety of models presented. Table 2.1 identifies the selected hardware platform from each vendor. To maintain the maximum standardization across all the sites, the platforms can be restricted even further than the selected alternatives. This may increase costs, but reduce the on-the-shelf inventory.

Table 3.1 – Selected PLC/DCS Hardware for evaluation

	Rockwell Automation	**Schneider Modicon**	**Emerson Ovation**
PLC/DCS Controllers Selected	**Model**	**Model**	**Model**
Medium PLC/DCS hardware	CompactLogix L33	M580	OCC100
Compact PLC/DCS hardware	CompactLogix L24	M340, Momentum	OCC100
Remote I/O	Flex I/O	M580, Momentum	N/A

We found that the Rockwell Automation CompactLogix platform is a very robust solution, which is easily expandable and easily accommodates Remote I/O via Ethernet. The CompactLogix has been on the market for over a decade with a very strong market base in California. It is still early in the product lifecycle and Rockwell Automation has asserted this platform will be supported well beyond 15-20 years, based on previous lifecycles with PLC-5, SLC-5 products. There are two versions of the CompactLogix platform we selected for the control system architecture. The CompactLogix L24 is a good choice for remote sites with consolidated power, networking, limited I/O and simple functionality. The CompactLogix L33 is a good choice for Tapia WWTP, Westlake Filter Plant or any location where the Flex I/O will extend the I/O monitored and controlled. There are memory limitations with the CompactLogix L33 processor, but after two rounds of review,

Rockwell Automation validated that the I/O requirements at Tapia WWTP will work with the PlantPAx architecture.

The substantial install-based of processors and the reliability of the supporting software tools to support the hardware (Logix base software) have a wide acceptance in the market. The return rate and failure rate was very low on the CompactLogix and Flex I/O platforms

Figure 3-1 – Rockwell Automation CompactLogix L24 & L33 controllers

For the Schneider Modicon PLC controllers selected, we determined there is a good market base in the Momentum and M340 platforms. The Modicon Momentum platform has been on the market for over two decades. Modicon has smartly modernized this platform without abandoning the form-factor. Momentum Unity Pro base PLCs are reliable and have a good track-record in the market. As a result, the Modicon vendor has recommended that Momentum installations do not require complete replacement, but a simple replacement of the “top hat” module. This will change to Ethernet-based, Unity Pro compatible processor. This will upgrade the PLC to use the Unity Pro software application while using the existing I/O terminal base. The Modicon M340 is a newer product in the lifecycle, but was launched in 2007. This rack-based solution brings good memory, power and modularity, but has some limitations in Remote I/O supported via Ethernet and ease of significant in-panel expansion (typical with most rack-based PLC platforms). The M340 does have limitations in remote I/O capability, as any additional M340 I/O bases have to be connected via Modbus Plus data bus not Ethernet, which has distance limitations.

Figure 3-2 – Schneider Modicon Momentum & M340 controllers

For the Emerson Ovation PLC controller selected, the Emerson vendor determined that the compact OCC100 platform would be ideal for the I/O quantities identified at Tapia WWTP, Westlake Filter Plant, and Water Operations sites. The OCC100 is approximately 60% less cost than the OCC400 controller (the controller used at Rancho Composting Facility) with many of the strengths and features of the standard Ovation system.

The OCC100 is just now in production and is in the infancy of the product lifecycle. Based on information from Emerson, they anticipate the first installations of this product to occur by April 2018. Some intangible costs may be associated with the OCC100, as the form factor of the product may require more significant modifications to the existing control panels at the remote sites.

Figure 3-3 – Emerson Ovation Compact Controller (OCC100) shown without I/O modules

Comparison of the MTBF and reliability data provided from the vendors indicates that all the vendors have robust hardware that will generally last 40-50 years, which outlasts the 10-15 year target range identified in this evaluation. It was difficult to get solid data on MTBF, as the vendors calculated the information differently. However, Rockwell Automation reliability numbers were the highest reliability, exceeding 50+ years for processor and remote I/O solutions. Reliability of hardware can be difficult to compare, based on the fiscal realities of maintenance. For example, if failed items (such as a power supply) were cheaper to replace than to return/repair, end users generally opted to not return or repair the hardware. This leads to reliability numbers which may be skewed for common hardware items, such as power supplies.

As a result, one of the best strategies for mitigating hardware failures is to standardize the hardware as much as possible and maintain limited shelf spares for processors, power supplies and I/O modules.

3.1.2 Software & Communication Reliability

Your team noted concerns with comparison between Modbus TCP and Rockwell Automation CIP protocol. Based on initial investigation, we determined that Modbus TCP does have a slightly more compact structure, but the CIP will not provide a prohibitive bandwidth. In particular, this seemed to be a factor for radio communication to remote sites. However, when using the 902-928 MHz bandwidth for radio telemetry, the bandwidth limitations are minimal.

This software reliability topic also focuses on the reliability of communication and tolerance for interrupts to the communication system. Based on initial research we determined that the communication differences we looked at are minimal and will not create any substantial impact to the performance of the SCADA system. In the case of Emerson Ovation system, the proprietary bus communication uses Ethernet IP for communication between the control room and the controller nodes. The bandwidth requirements were not fully vetted or identified, but Emerson validated that communication via Ethernet radio was viable.

As part of the communication reliability between the centralized SCADA system and the remote sites, especially in the Water Ops system, the telemetry system will require upgrades. The current

radio and PLC hardware will not support Ethernet communication. As a result, when the PLC hardware is upgraded the telemetry system must be replaced at the same time. The overall architecture for the Water Ops system may remain similar, but all serial radios will need upgrade to Ethernet radios. The antenna cable and antenna infrastructure may remain the same, as we recommend maintaining the existing radio frequency of 902-928 MHz.

3.1.3 Standardized Logic

We noted a chief concern in the workshop meeting regarded standardization of the PLC and HMI functionality so that the District will gain more autonomy and ability to support the PLC logic and HMI applications. Specifically, the District wants the ability to solicit support from a variety of system integrators and yet get the same quality of PLC logic. Your team is looking for standardized solutions supported by the vendor, not just applications that are the product of an arbitrary or specific system integrator's template. For this evaluation, the more standardization supported by the vendor resulted in higher scores in the decision matrix.

The Rockwell Automation solution evaluated is widely advertised as their PlantPAx solution. This approach is dependent on running Rockwell Automation PLC and HMI applications. When using PlantPAx, your team and your chosen system integrator(s) can implement vendor-supported templates which are validated to perform in the specific application. Additionally, by using the vendor-supported templates, the Rockwell Automation tech support staff will be able to provide easy support troubleshooting or resolution for any PLC logic or HMI function. Even if the PlantPAx solution is not implemented, the Rockwell Automation PLCs have advanced Add-On Instructions (AOIs) which support object-oriented programming, including nesting of multiple levels of objects.

The current Schneider Modicon and Wonderware solution relies on tag-based mapping to translate the data from Modicon Unity Pro application to Wonderware InTouch application. However, the new Wonderware System Platform solution allows for object-oriented connection direct to the Unity Pro application and the controller. The Unity Pro software uses DDTs (Derived Data Types) and DFBs (Derived Function Blocks) and has good function block utilities, which allows the user to create standardized tag and logic templates. Wonderware System Platform uses object templates that can parallel the Unity Pro DDTs. The new Wonderware System Platform objects can be display side-by-side with the older Wonderware InTouch application. As a result, this allows your team to implements the new SCADA graphics without having to abandon the old SCADA application in an "all or nothing" approach. This approach can be tedious and add more development/programming time to SCADA application.

The Emerson Ovation solution has standardized logic that is maintained by the vendor, as they self-perform implementation of their DCS system. As a result, there is standardization at the vendor level. They have maintained multiple iterations of Ovation DCS and develop updates to the system on a yearly basis. From information provided by the vendor, it seems that periodic updates are required to implement major updates.

3.1.4 Alarm Management

Alarm management strategies have had significant improvements in the last five years, especially with the advent of the ISA 18.2 Alarm Management standard. Improved alarm management can reduce the workload and improve situational awareness for the operator. SCADA software platforms have integrated functionality to aggregate alarms, shelve alarms, and better identify alarms as part of their standard offering. Alarm management should help operators identify the root cause behind the alarm notification. Additionally, the alarm management should give operators a flexible approach to properly deal with non-critical alarms

Based on initial investigation, we determined that Rockwell Automation and Emerson have the most sophisticated alarm management, where the SCADA software application does incorporate

the recent ISA standard. Furthermore, Rockwell Automation has developed PLC-level objects and functionality for alarm management. This increases the reliability of the alarm management approach, since the PLC platform has a statistically higher MTBF than alarm management software running on a standard computer workstation or server.

Wonderware System Platform does have the ability to provide alarm severity and management, but the features associated with this functionality require more customization and scripting than that required of the other vendors. However, System Platform structure does allow for easy filtering based on “Area”, which is pre-built into the structure of the application.

Alarm notification (via phone, text or e-mail) is a critical part of alarm management, especially when your operators are typically not occupying the control room on a regular basis. Based on interviews with your team, it was clear that your operators are frequently in the field and not in front of the SCADA application. As a result, the alarm notification system holds a priority in any future upgrade.

For Emerson Ovation, the alarm notification is integral to their system. For Rockwell Automation and Wonderware, there are third party solutions recommended for alarm notification. As noted in the investigation above, the styles of alarm notification vary at each facility. We recommend that improvements in the alarm notification system to allow for more redundancy. This will provide more confidence in the alarm system.

3.1.5 Data Storage & Retrieval

Based on feedback received from your team, we included an evaluation of the Historian software included as part of any SCADA software package. The Historian software is critical for long-term storage of key process data, parameters, events and alarms. Effective trending is dependent on efficient storage and retrieval from the Historian server. We evaluated the reliability, ease of configuration and effectiveness of data retrieval of the Historian products.

Wonderware Historian is a robust platform, using SQL database “under the hood”. Wonderware System Platform integrates extremely well with Historian, such that very little configuration is required to add tags into the Historian from the System Platform IDE. The Wonderware Historian Client tool is very user-friendly and provides intuitive interface for users. Previous versions of Wonderware Historian have had challenges with the speed of data retrieval for trends and queries using the Historian client or embedded InTouch trends. Wonderware System Platform 2017 release has resolved many of the speed issues. Wonderware also offers Excel plug-in tools that allow managers and technicians to combine SCADA data with other lab, maintenance, or operational data in a simple spreadsheet retrieval. Wonderware reporting can be very simple using SQL Server Reporting Services (SSRS) or Dream Reports, offered by Wonderware.

Rockwell Automation FactoryTalk Historian also uses SQL database for data storage and retrieval. This solution was formerly OSI Pi and integrated into the Rockwell Automation product suite over 10 years ago. The FTHistorian solution is a well-integrated solution, as PlantPAx integrated architecture allows the Historian to see down to the PLC objects/tags with ease. Rockwell Automation offers several Historian client options: Processbook, VantagePoint dash-board display, and Excel plug-in tools are very helpful features for managers and technicians.

Emerson Ovation Process Historian also uses SQL database. Sequence Of Events (SOE) history review tool supports the retrieval of this data into a chronologically ordered list in response to queries. The operator can access alarms, events, and other process data to analyze upset conditions or alarm events. The scalability of the Ovation controller is good, as it can handle up to 200,000 tags, though the pricing received from vendor did not indicate this tag count. Ovation supports reporting via SAP Crystal Reports, which is a powerful but expensive reporting platform.

3.2 Total Life Cycle Costs

Your team has emphasized that total life cycle costs is not the most important metrics, but a very key metric that will support their decision for SCADA upgrades in the future. In our evaluation, we determined total lifecycle costs to be comprised of the following:

- Initial Installation Costs
- Operations & Maintenance Support Costs
- Training Costs

3.2.1 Initial PLC Hardware Costs

Using the PLC inventory developed by the District and our field investigations, we made design decisions to provide the most reliable and standardized PLC infrastructure with the lowest possible cost. We developed a preliminary PLC architecture for each of the water systems using these criteria. Based on our industry experience and these criteria, we selected the best offerings from the hardware vendors.

Several of the assumptions and decisions we made provided the most consistency in the comparison of the PLC hardware vendors. Here are the decisions that led to our PLC hardware selection and basis for hardware comparison:

- Tapia WWTP:
    - We targeted reduction of the PLCs, using Remote I/O racks where possible to consolidate PLCs. We generally focused around each of the major plant processes.
    - Where the existing PLCs had a significant number of I/O, we opted to use the Medium PLC (CompactLogix L33 and M580). We validated that expansion and memory capacity of these controllers for the functions identified. For Rockwell Automation PLCs, we revisited the memory requirements with the vendor. They validated that the CompactLogix L33 could serve a PlantPAx approach in the Tapia WWTP application.
    - For the replacement of the Filter PLCs and other PLCs with limited I/O, we opted to use the Compact PLCs (CompactLogix L24 and M340). We chose to use Individual Filter PLCs to provide the maximum process redundancy for the plant.
- Water Ops:
    - We targeted use of Compact PLCs throughout.the system, as there are limited I/O and functions per site.
    - For existing Momentum PLCs, we opted to retain the existing installation and simply replace the Momentum PLC “top hat”. We chose to use an Ethernet-based Unity Pro version of the Momentum PLC. This helped reduce the Schneider Modicon PLC costs for these sites.
- Westlake Filter Plant
    - We did not consolidate the existing PLCs at this facility, as there is already a limited number of PLCs. We chose to use Individual Filter PLCs to provide the maximum process redundancy for the plant.
    - We opted to use a blend of the Compact and Medium PLCs, based on the I/O and memory requirements. At this facility, all the Modicon PLCs were selected to be M340s. Due to memory limitations of the CompactLogix L24, we opted to use CompactLogix L33 for PLCs with more I/O and memory requirements (such as the main Plant PLC,
    - For the replacement of the Filter PLCs and other PLCs with limited I/O, we opted to use the Compact PLCs (CompactLogix L24 and M340).

After we developed the proposed PLC architecture, we tasked vendors to provide cost estimates for the PLC hardware replacement. **We ensured that vendors based quotes upon standard system integrator pricing and not project-specific pricing**.

We focused our cost comparisons on PLC hardware replacement. We did NOT include all project costs associated with replacement of these PLCs. We considered the costs associated with standard control panel hardware (power supplies, terminal blocks, relays, etc.), telemetry and other hardware appurtenances equal across the proposed vendor options. These are not included here.

To provide equitable comparison of the PLC hardware and reduce the number of PLCs at the Tapia WWTP and Westlake Filter Plant, we provided vendors with the anticipated PLC architecture and locations where Remote I/O would be feasible.

- For example, at the Tapia WWTP Centrate process area, we identified PLC 96 would be the primary PLC, while functions for existing PLCs 95 and 97 would be accomplished via Remote I/O.

We received quotes from Rockwell Automation and Schneider Modicon vendors, which broke down the costs to the individual component level. We have provided a sample cost break-down for the Tapia WWTP in Appendix C. We did not receive a cost breakdown from Emerson Ovation hardware, but a lump sum quote. As a result, we evenly distributed the lump sum cost across the PLCs in question.

As shown in the tables below, the Modicon PLC hardware solutions are the most cost-effective.

Table 3.2. – PLC Hardware Install Estimate of Costs for Tapia WWTP

PLC Number	Location Site	PLC/ RIO	Rockwell Price	Modicon Price	Ovation Price
95	Centrate	RIO	$2,318	$1,846	$2,555
96	**Centrate**	**PLC**	$7,362	$8,608	$2,555
97	Centrate	RIO	$4,154	$2,493	$2,555
5	Chemical	RIO	$4,154	$2,049	$2,555
25	**Chemical**	**PLC**	$5,620	$7,899	$2,555
37	Chemical	RIO	$4,614	$2,660	$2,555
38	Chemical	RIO	$4,614	$2,333	$2,555
39	Chemical	RIO	$4,614	$2,660	$2,555
6	**Control**	**PLC**	$5,729	$3,087	$2,555
2	CP100	RIO	$7,154	$4,412	$2,555
33	**CP100**	**PLC**	$5,894	$8,005	$2,555
34	CP100	RIO	$5,194	$3,706	$2,555
35	CP100	RIO	$4,154	$3,413	$2,555
1	CP1000	RIO	$4,614	$2,876	$2,555
7	CP1000	PLC	$5,837	$7,755	$2,555
9	CP1000	RIO	$5,070	$2,919	$2,555
29	CP1000	RIO	$5,712	$2,633	$2,555
36	CP1000	RIO	$1,920	$1,399	$2,555
3	Effluent	PLC	$4,449	$2,908	$2,555
41	Effluent PS	RIO	$1,796	$2,488	$2,555
4	Filters	PLC	$4,148	$2,780	$2,555

10	Filters	PLC	$2,411	$1,900	$2,555
11	Filters	PLC	$2,411	$2,496	$2,555
12	Filters	PLC	$2,411	$2,496	$2,555
13	Filters	PLC	$2,411	$2,496	$2,555
14	Filters	PLC	$2,411	$2,496	$2,555
15	Filters	PLC	$2,411	$2,496	$2,555
16	Filters	PLC	$2,411	$2,496	$2,555
17	Filters	PLC	$2,411	$2,496	$2,555
18	Filters	PLC	$2,411	$2,496	$2,555
19	Filters	PLC	$2,411	$2,496	$2,555
20	Filters	PLC	$2,411	$2,496	$2,555
21	Filters	PLC	$2,411	$2,496	$2,555
22	Filters	PLC	$2,411	$2,496	$2,555
8	Force **Main 2**	PLC	$6,709	$3,610	$2,555
26	Headworks	PLC	$4,527	$6,912	$2,555
27	Headworks	RIO	$2,318	$1,580	$2,555
28	Headworks	RIO	$2,318	$1,580	$2,555
23	Lift **Station 1**	PLC	$7,563	$4,061	$2,555
41	Lift Station 1	RIO	N/A	N/A	$2,555
24	Lift Station 2	PLC	$7,563	$4,061	$2,555
42	Lift Station 2	RIO	N/A	N/A	$2,555
			$165,888	$132,585	$107,310

Table 3.3. – PLC Hardware Install Estimate of Costs for Water Operations

		Rockwell	Schneider	Emerson
PLC	Location	Automation	Modicon	Ovation
Number	Site	Price	Price	Price
205	3 Springs PS	$2,355	$2,859	$2,161
203	Agoura PS	$3,010	$2,889	$2,161
204	Argos Valve	$2,153	$1,050	$2,161
176	Calabasas Tank	$2,153	$1,050	$2,161
114	Cold Canyon PS	$2,153	$2,868	$2,161
154	Conduit PS	$2,355	$2,859	$2,161
202	Cornell PS	$3,347	$2,362	$2,161
175	Dardenne PS	$3,010	$2,194	$2,161
228	Equestrian Tank	$2,153	$1,050	$2,161
224	JBR PS	$2,355	$3,010	$2,161
107	Jed Smith PS	$3,009	$3,010	$2,161
106	Jed Smith Tank	$2,153	$1,050	$2,161
223	Kimberly PS	$2,355	$2,859	$2,161
222	Kimberly Tank	$2,153	$1,050	$2,161

		Rockwell	Schneider	Emerson
PLC	Location	Automation	Modicon	Ovation
Number	Site	Price	Price	Price
92	Latigo Tank	$2,153	$1,050	$2,161
134	Lower Oaks PS	$3,010	$2,194	$2,161
135	Lower Oaks Tank	$2,153	$1,050	$2,161
163	LV1 Flowmeter	$2,153	$1,050	$2,161
15	LV2 PS	$2,153	$2,521	$2,161
108	McCoy PS	$3,010	$2,194	$2,161
110	McCoy Tank	$2,153	$1,050	$2,161
226	Morrison Tank	$2,153	$1,050	$2,161
105	Morrison PS	$2,355	$2,164	$2,161
179	Mulwood PRV	$2,153	$1,050	$2,161
174	Mulwood PS	$2,355	$2,164	$2,161
173	Mulwood Tank	$2,153	$1,050	$2,161
178	Oakridge PS	$3,010	$2,194	$2,161
209	Ramera Ridge Valve	$2,153	$1,050	$2,161
136	Ranchview PS	$3,010	$2,194	$2,161
113	Saddlepeak Tank	$2,153	$1,050	$2,161
229	Saddletree PS	$2,355	$2,859	$2,161
227	Saddletree Tank	$2,153	$1,050	$2,161
208	Seminole PS	$3,228	$2,889	$2,161
207	Seminole Tank	$2,153	$1,050	$2,161
112	Stunt Road PS	$3,010	$2,194	$2,161
162	Twin Lakes PS	$3,010	$2,194	$2,161
164	Twin Lakes Tank	$2,153	$1,050	$2,161
133	Upper Oaks PS	$3,078	$2,194	$2,161
209	Upper Oaks Tank	$2,153	$1,050	$2,161
156	Upper Twin Lakes PS	$3,010	$2,194	$2,161
153	Warner PS	$3,010	$1,050	$2,161
172	Warner Tank	$2,153	$1,050	$2,161
206	Westlake PRV	$2,153	$1,050	$2,161
155	Woolsey Tank	$2,153	$1,050	$2,161
177	005 Flowmeter	$2,153	$1,050	$2,161
2	Cordillera Reservoir	$2,153	$2,070	$2,161
231	County Line Flow	$2,153	$1,050	$2,161
103	Indian Hills Tank	$2,153	$1,050	$2,161
232	Morrison PS	$3,010	$2,194	$2,161
225	Oakpark PS	$3,010	$2,444	$2,161
136	Parkway PS	$3,010	$2,194	$2,161
104	Reservoir 3	$2,153	$1,050	$2,161

		Rockwell	Schneider	Emerson
PLC	Location	Automation	Modicon	Ovation
Number	Site	Price	Price	Price
1	RWPS	$3,010	$2,194	$2,161
230	Westlake Wells	$3,010	$2,164	$2,161
230	Westlake Wells	$2,153	$1,050	$2,161
		$136,734	$96,669	$118,855

As mentioned above, the Schneider Modicon vendor has recommended that Momentum processors do not require complete replacement, but a simple replacement of the "top hat" module, which will upgrade the PLC to use the Unity Pro software application while using the existing I/O terminal base. This approach helps reduce initial hardware cost for the Schneider/Modicon solution.

Table 3.4. – PLC Hardware Install Estimate of Costs for Westlake Filter Plant

		Rockwell	Schneider	Emerson
PLC	Location	Automation	Modicon	Ovation
Number	Site	Price	Price	Price
23	Plant	$7,454	$4,257	$2,804
11	Filter 1	$2,651	$2,581	$2,804
12	Filter 2	$2,651	$2,581	$2,804
13	Filter 3	$2,651	$2,581	$2,804
14	Filter 4	$2,651	$2,581	$2,804
15	Filter 5	$2,651	$2,581	$2,804
16	Filter 6	$2,651	$2,581	$2,804
17	Filter 7	$2,651	$2,581	$2,804
18	Filter 8	$2,651	$2,581	$2,804
19	Filter 9	$2,651	$2,581	$2,804
20	Filter 10	$2,651	$2,581	$2,804
21	Filter 11	$2,651	Existing M340	$2,804
22	Filter 12	$2,651	Existing M340	$2,804
25	LCP 25 - Chemical	$4,276	$2,334	$2,804
26	LCP 26 -	$4,575	$2,689	$2,804
27	LCP 27 - Torchwood Tank	$2,817	$2,581	$2,804
14A	RTU - 14A - Pump Station	$6,854	Existing M340	$2,804
		$57,788	$37,671	$47,668

3.2.2 *Initial HMI/SCADA Software Costs*

Using the SCADA applications developed at each facility and investigation of field functionality, we tasked vendors to provide standard cost estimates for the HMI software replacement. We requested that vendors base quotes/cost estimates upon standard pricing and not project-specific pricing.

Initial cost estimates for HMI application software were focused on the following considerations for upgrade:

- Upgrade from current HMI application to a more robust and redundant architecture:
  - This was applicable for all vendors, including Wonderware. The current Wonderware InTouch application needs additional redundancy and upgrades to provide a robust SCADA application.
- Upgrade to integrate with new PLC platform selected
  - This is applicable for all vendors, including Wonderware. Each HMI application will require engineering and programming work to integrate the existing graphics and functions to the new PLC logic. By moving to standardized, object-oriented approach for PLC logic, there will be less work to integrate with the SCADA application. However, the engineering costs associated with the PLC logic and SCADA software are still significant to incorporate PLC logic and HMI functions into the upgraded system.
- Change from current HMI application to another vendor:
  - This includes Wonderware System Platform, Rockwell Automation and Emerson Ovation solutions, as these would require new software licensing, configuration and implementation to match the existing Wonderware InTouch application.
    - The transition from Wonderware InTouch to System Platform provides more flexibility for the District to maintain the existing application and do a progressive upgrade
  - This work includes the cost to build up the new HMI application to match the graphics and process functions. This also included the software licensing associated. This did not include time required for integration to the PLC, as that of PLC hardware replacement, SCADA software replacement. We considered the costs associated with standard control panel hardware (power supplies, terminal blocks, relays, etc.), telemetry and other hardware appurtenances equal across the proposed vendor options.

Table 3.5 – Initial Software Costs Comparison

	Total (Rockwell Automation)	Total (Rockwell-Wonderware)	Total (Schneider-Wonderware)	Total (Emerson Ovation)
Initial Software Costs				
Software Licensing	$ 113,200	$ 53,000	$ 50,000	$ 133,500
Estimated Engineering/Implementation	$ 900,000	$ 900,000	$ 900,000	$ 1,130,000
	$ 1,013,200	**$ 953,000**	**$ 950,000**	**$ 1,263,500**

Note that Table 3.5 is not a total cost estimate for the upgrade of the District control systems. Rather the table is focused on the costs specifically associated with the software upgrades and modifications.

3.2.3 Operations & Maintenance Support Costs

We recommend that an upgrade of SCADA server storage, memory, or software be required within a 10-15 year span. We suggest your management team budget for at least one replacement of this during the 10-year cost cycle, which is good practice and included in our estimate for O&M costs.

Additionally, the largest recurring cost is the SCADA licensing and support. The more costs are consolidated across both PLC and HMI components, the more efficient the support costs. The annual licensing and support costs of Rockwell Automation and Schneider-Wonderware differ by an estimated $10,000, as shown below in Appendix B.

Even though Wonderware and Modicon are both under the Schneider “umbrella”, there are separate support and licensing costs associated with each software. As Wonderware and Schneider have separate distributors and support for the PLC and SCADA software packages. These costs are shown in Appendix B. Conversely, there is just one support cost for PLC and HMI support for a Rockwell Automation solution. For purposes of the cost estimate, we separated the Rockwell Automation costs to roughly show the split, according to the Rockwell Automation vendor.

3.2.4 Training Costs

Initial investigation revealed that training costs were roughly similar between the various vendors. It seemed that the approximate cost per a standard programming class ranged from $1200-$1600 per day. However, on-site training is available from most of the vendors if a large enough class attends. Distributor options for training appear to have the least cost, but may have limitations in the training content.

Training offerings and availability from Rockwell Automation and Wonderware are driven by both the vendor and their distributors. Both vendor and distributor are promoting local training opportunities on a regular basis. Training availability for Emerson Ovation seems more specific to their San Diego or other offices outside of the Southern California region. Costs associated with these training will have to factor in longer time “out of pocket” and more travel time/expense.

3.3 Ease of Use & Integration

3.3.1 Hardware

Based on information from the District, there is concern about the ease of hardware installation, but more importantly, the modularity of the hardware to facilitate hardware expansion in the future. Specifically, staff is hopeful that the new PLC platform can easily accommodate expansion without abandoning the current installation.

All three vendors have modular solutions which allow for expansion. The challenge in our evaluation was to rank that hardware based on ease of expansion and ease of modularity for the District.

The Modicon M340 and M580 solutions are rack-based solutions. This creates a modular functionality but it does create limitations for expansion. The M580 allows for Remote I/O via Ethernet, while the M340 has limitations in supporting Remote I/O. Modicon recommends extending the M340 using the Modbus Plus bus connect to additional M340 racks (up to 3 total), if within a limited distance. The Momentum controllers are also modular and add new cards by extending the Modbus Plus bus to the next chassis. The physical space required for the M340 or Momentum solutions is modest and will likely fit in existing District panels.

Additionally, we noted that the M340 and M580 backplanes are also different, so if the District selects Modicon PLC, they should expect standardization around two types of backplane. If only M340 is selected, this would limit opportunities for Remote I/O in Tapia or Westlake facilities.

The Rockwell Automation CompactLogix solution is modular and expandable without modifying an existing installation. The CompactLogix platform can support Remote I/O via Ethernet, but in a different form factor. The Rockwell Automation Flex I/O base provides the Remote I/O expandability for the CompactLogix. The physical space required for the CompactLogix solution is modest and will likely fit in existing District panels.

Similar to the M340 and M580 comparison, the in a few locations where a larger PLC is required, the Rockwell Automation ControlLogix PLC is a different style backplane so will require a second style of backplane.

The Emerson Ovation solution (OCC100) is a new product, so we were unable to view installations of this product. However, based on the Emerson documentation, the main controller supports an expandable amount of I/O, but it seems that the District may be required to select the layout/configuration in advance. We estimate that the physical space required for the OCC100 and the supported I/O modules may exceed the existing control panel size.

3.3.2 Software Development

Fault tolerance for SCADA system hardware and software, in general, relates to the criticality of the water and wastewater systems, especially in upset or failure conditions. In most cases, the criticality of the function of one remote site does not dictate redundant hardware, software or telemetry. The District does not currently have SCADA server redundancy or redundant PLCs. We anticipate that this will be the most problematic for a critical failure in the SCADA software or hardware.

As a result, we suggest that any SCADA platform selected be tailored around a more fault-tolerant approach. In this case, we evaluated the ability for the SCADA software to plan for disasters and support a disaster recovery plan for the most common failures or events. This is recommended to reduce downtime, should a failure in your SCADA software or hardware occur. Industry best practices have continued to drive toward the virtualization of software operating systems to provide hardware independence/flexibility, ease of recovery, and redeployment and reduction of hardware requirements.

The following is the recommended Server configuration to add virtualization, increase redundancy and increased disaster recovery capability. We used this architecture as the basis for comparison across the three vendor solutions:

- Server/Host 1
    - VM1 – Domain Controller, Primary
    - VM2 – SCADA Application Server, Primary w/Alarm Notification
    - VM3 – Terminal Server, Primary
    - VM4 – Development Workstation
- Server/Host 2
    - VM5 – Domain Controller, Secondary
    - VM6 – SCADA Application Server, Secondary w/Alarm Notification
    - VM7 – Terminal Server, Secondary
    - VM8 – Historian Server

Table 3.7 – Selected SCADA Software for evaluation

	Rockwell Automation	Schneider Wonderware/Modicon	Emerson Ovation
PLC Software	Studio 5000	Unity Pro	Ovation OC100
HMI Software	FactoryTalk View SE	System Platform	Ovation

There were several important factors for evaluating the ease of software implementation, including the following:

- Standardized structures, objects, and logic
- Object-oriented approach to structures, logic, and graphics
- Vendor supported standardized structures and objects

The Wonderware InTouch platform, which is currently in-place at the District, is a tag-based system and does not fully support an object-oriented approach to interface with the PLC logic. As a result, our evaluation targeted the Wonderware System Platform application. This software package is the latest offering from Wonderware and the best consideration for comparison to the other software vendors. Wonderware System Platform is a very robust and object-oriented software tool. By focusing our evaluation on this software, all the SCADA options on the table will require an upgrade to implement the SCADA recommendations.

The Modicon Unity Pro software is a very robust PLC program. Unity Pro leverages industry standard programming structures and includes many pre-defined function blocks. One of the best features is the ability to create customized and modular function blocks for a given object or process. These function blocks can be modified during runtime, unlike some of the other vendors.

For communication between the Modicon PLC and Wonderware System Platform, many System Integrators have relied upon the Modbus TCP communication driver. Your current system uses Modbus TCP drivers for communication to the Wonderware InTouch application. For purposes of this evaluation, we updated to compare the Schneider IP communication driver, called OPC Factory Server (OFS). This protocol allows for communication of objects from the Modicon Unity Pro tags to the Wonderware System Platform objects without specialized tag-mapping, scripting or third party interface. The OFS tool was developed by Schneider Modicon.

The Rockwell Automation Studio 5000 and FactoryTalk View SE platform work together in a vendor strategy called PlantPAx. This approach matches the same logic structures and objects from the PLC platform to the HMI platform. As a result, there is a high degree of synchronization between the software and the communication using the Allen Bradley CIP protocol, which is widely supported by Rockwell Automation. The Studio 5000 logic, structures and objects are also supported by Rockwell Automation, not just the local system integrator. As a result, the on-going support and standardization of the application earned a high ranking in this category. This is a significant “value-add” feature for this vendor and was a slight differentiator in the Standardization ranking of the Decision Matrix.

3.3.3 Situational Awareness integrated

Situational Awareness (SA) graphics used in HMI systems have become increasingly in demand for water agencies. Many industries have used this approach for years, as operators need their attention on the most critical events in the system and not distracted by nuisance or minor events or information. The industry best practice calls for Situational Awareness graphics to achieve a highly functional HMI and reduce workload on the operator.

Both Wonderware and Rockwell Automation have made strides in recent releases of their software to stay current with industry best practices for HMI graphics. These SA toolkits provide

the SCADA software developer with more pre-built options that can be implemented into future graphics.

More information is required from Emerson Ovation about embedded situational awareness graphics. The graphics provided at the Rancho facility did not contain the level of situational awareness consistent with the current industry best practice.

3.3.4 Data storage and retrieval

Access to historical data and configuration of the Historian both factor into the ease of use. The configuration requirements include selection of process data to be stored, ease and flexibility of retrieval of historical data. Wonderware and Rockwell Automation solution both have excellent Historian interfaces and data retrieval. In both software applications, once the Historian is installed and connected to the network there is limited configuration required to identify historical data points. Both Historian client applications are very intuitive and allow for flexible modification of trends, queries, and reports. They leverage the strength of the SQL database, while running operations to keep the file size and query time limited.

Emerson Ovation solution has good event recreation and sequence of events. The historian is a well-integrated piece of the HMI application. Alarms, events, and historical tracking of these is embedded in the development and retrieval tools.

3.4 Long Term Support

3.4.1 Distributor Support

The quantity of distributors within the region did not seem an appropriate metric for this evaluation, though that was a factor in determining how robust the Distributor support was for the vendors in question. The quality and support from the vendor-recognized distributor was an important factor. From information collected and our experience, the Wonderware, Modicon and Rockwell Automation distributors in the region are robust and well connected with the vendor. It is important to note that Schneider distributors in the region are many, but we did not find that all Schneider distributors were capable of supporting Modicon PLC support needs. Additionally, the District would need to maintain two separate distributors to support Modicon and Wonderware solutions. This may be a slight drawback in comparison. However, the hybrid solution, using Rockwell and Wonderware would also require two sets of distributors as well.

The Emerson model of business does not include distributors, so the District is required to get all their support from the Emerson San Diego office. This does create a limitation in support compared to the local distributors.

3.4.2 System Integrator Support

One of the biggest concerns that your team noted during the workshop was the ability to use multiple system integrators to implement modifications or perform troubleshooting. Currently the District is limited in their choices of system integrators. Part of this is due to the scarcity of system integrators who will support older version of Modicon; another factor is the lack of standardization and unnecessary complexity.

Table 3.8 – Number of regional recognized System Integrators, per vendor

	Rockwell Automation	Schneider Wonderware/Modicon	Emerson Ovation
System Integrators	7	5	1

Wonderware, Modicon and Rockwell Automation have programs to certify and recognize system integrators who are skilled with their product and can provide excellent performance using their product. This category was comparable between the Rockwell Automation and Schneider solutions.

Emerson does not follow the model of local system integrators. As a result, there is only the Emerson San Diego office that supports Ovation clients in the region. They have a team of engineers and technicians that support all the California-based installations.

3.4.3 Availability of Training

Initial investigation revealed that centralized training availability is comparable between the various vendors. Rockwell Automation, Wonderware, and Modicon, all have specific offices or facilities in the region that conduct training on a regular basis. However, the Rockwell Automation, Wonderware and Modicon vendors provide distributor-based training on a more frequent basis and in the local area.

Based on interviews with staff and other distributors, it appears that training focused by Distributor or vendor in local settings have as much value as training conducted in the central facilities. In the case of Emerson, the training is generally conducted in Eastern U.S., but their San Diego office does support training.

In addition to the availability, we evaluated the number of trainings required, how well the distributor trainings integrated with the vendor training. In particular, we noted that the Schneider-Wonderware solution would require two completely separate training curriculums, adding some increased costs and time for your staff. For example, Unity Pro training and Wonderware System Platform training are hosted by two completely separate distributors who apparently have little interface between them.

By contrast, we noted that the Rockwell Automation offerings have more cohesiveness between the local Distributor and the vendor, where Rockwell sponsored events through the Distributor are commonplace. Additionally, we noted that Rockwell Automation training is targeted toward the PlantPAx platform in a comprehensive training, which addresses both the PLC and HMI functions. This does not necessarily reduce the training hours, as training is still required in both areas, but it does provide training efficiencies for your team.

Emerson Ovation was evaluated for the training, though not as much information was available at the time of this report. Similar to Rockwell Automation, the training is a comprehensive training of both the controller-level logic and the HMI functions for operator interface. However, based on the training course offering, these courses are broken into several pieces.

3.4.4 Vendor Lifecycle History

One of the best metrics for future performance is past performance. As a result, this category focused on previous lifecycle history for the vendors selected.

Schneider Modicon has a good track record for lifecycles in their Quantum and Momentum PLC platforms over the last 20 years. The vendor has created transitions The M340 and M580 controller platforms are newer and early in their lifecycle. The software platforms used Unity Pro and Wonderware have decent backward compatibility for older versions.

Rockwell Automation has a proven track record for their PLC-5, SLC, CompactLogix, and ControlLogix PLC platforms over the last 20+ years. They have created legacy support programs specifically to continue manufacturing and supporting the hardware, without changing form factors or requiring additional hardware. Additionally, the software platforms used to support the

PLC and SCADA software have a long track record with compatibility across the many versions (Logix series).

Emerson Ovation approach to maintaining the DCS lifecycle is continuous updates and improvements. Emerson manages multiple supported versions of the DCS system. At strategic they recommend their “Evergreen” upgrade programs to keep end-users on the most current version of hardware/software. The Evergreen program does require additional cost for each significant upgrade of the system.

3.5 Cybersecurity

Your team noted concerns with cybersecurity, though this was not identified as a decision factor in the decision matrix. Based on industrial control system security best practices, it is clear that PLC and HMI software platform security must start at the infrastructure layers above the PLC and HMI applications. To optimize the security of the control system, physical and network access to the PLC and HMI hardware/software should be tightly governed by implementing industry best practice, including:

- Proper and frequent management of access control to the control system network and applications, including formal procedures for when employees start or finish work at the agency.
- Use of employee specific access control/permissions and not common access for groups (i.e. do not use “Operator” as user access name).
- Locate control system networks and remote devices behind firewalls, and isolate them from the business network.
- Physical controls should prevent an unauthorized person from accessing the control system servers or controllers.
- All programming software should be kept in locked cabinets and should not be connected to any network other than the control system network.
- Laptops that have connected to any other network besides the control network should not be allowed to connect to the control networks without proper scanning/cleaning.
- Minimize network exposure for all control system devices and/or systems, and ensure that they are not accessible from the Internet.
- When remote access is required, use secure methods, such as Virtual Private Networks (VPNs), recognizing that VPNs may have vulnerabilities and should be updated to the most current version available. Also, recognize that any VPN is only as secure as the connected devices.

From our site visits and the gathered information, it is clear that the District does implement these security best practices. Your team has taken care to create separation between the business and control system networks, ensuring that remote connections are made thru secure VPN channels.

In evaluating the vendor hardware/software, we determined that all the vendors evaluated have experienced periodic vulnerabilities. The Department of Homeland Security (DHS) has an ICS-CERT team that evaluates the vulnerabilities of control system platforms across a wide variety of vendors. For example in early 2018, ICS-CERT issued an alert regarding “CPU hardware vulnerable side-channel attacks”, which identified Schneider, Wonderware, Rockwell Automation, and Emerson products as vulnerable to the compromise.

All the control system vendors have responded to these increasing security threats and vulnerabilities with updates to the hardware and software applications in the last 5+ years. For example, Rockwell Automation has added a FactoryTalk Security integrated tool that is used limit access to individuals with a legitimate need. Similarly, Schneider has integrated cybersecurity improvements into Unity Pro software and M580 product line releases. These factors do impact product reliability and long-term viability and should be a consideration for the final product.

3.6 Decision Matrix

To provide an objective comparison between the vendors, we used a weighted decision matrix to evaluate each of the criteria presented above. Your team provided the weighting factors and we provided the ranking. The rankings provided under four main criteria are based on multiple factors, including the following:

- Cost estimates from the vendors
- Reliability statistics from the vendors
- Lifecycle information from the vendors
- Evaluation of key hardware and software features of each platform
- Project experience with vendor platforms
- Comparison of the hardware/software with industry standard functionality

We used the following scales for the evaluation criteria and ranking:

- Criteria: Scale of 1 to 5, where 5 is the most critical and 1 is the least critical
- Ranking: Scale of 1 to 10, where 10 is the highest rank and 1 is the lowest rank

As a result, the maximum scores for each category are shown in Table 3.9 below.

Table 3.9 – Decision Matrix Criteria Maximums

Evaluation Criteria	Importance Factor	Maximum	
		Ranking	Point Value
Operational Function & Reliability	5	10	50
Life-Cycle Costs	4	10	40
Ease of Use & Integration	3	10	30
Long Term Support	3	10	30
Totals			**150**

4. Recommendations & Conclusion

The District has a unique opportunity to standardize and modernize its SCADA systems to meet current and future service needs. Your team made a prudent decision to evaluate its options prior to advancing forward with a SCADA system upgrade that needs to support them for at least the next 10-15 years. Once implemented, the new SCADA system will provide operators the capability to focus on the most important process issues, reduce the downtime associated with non-standard hardware and programs, and have more autonomy and control over modifications/expansions to the system. By performing this evaluation and making an informed decision your team will have a SCADA system that will meet your criteria.

We found that all the vendors and solutions evaluated have good solutions. The challenge is to pick the best one for the District. Our recommendations will provide you a solid footing for making the best long-term decision.

4.1 Recommendations

The following recommendations will provide improvements to your existing SCADA system, regardless of the vendors selected:

- Improve reliability of the SCADA systems by moving to more fault tolerant, redundant and quick recovery solutions.
    - Cannon recommends a virtualized solution and upgraded version of SCADA software, for better redundancy and disaster recovery.
    - Cannon concludes that a simple, effective way to implement a SCADA system and prepare for disaster is to implement a minimum of two physical servers with sufficient memory, storage, and processing speed to handle multiple virtualized operating systems. This will allow redundant SCADA server applications to run in parallel and other virtualized SCADA applications.

- Upgrade of telemetry system will be required, especially in the Water Operations system, as each of the remote sites requiring upgrades will migrate away from natively operating using serial communications. The M340 and CompactLogix controllers evaluated use TCP/IP as the native communication.
    - We recommend the District upgrade the sites to communication via a robust and secure Ethernet radio system.
    - The existing radio paths and ISM band antennas can be reused, reducing the cost of the upgrades/installations of new Ethernet radios.

- We recommend that any upgrade of the Tapia WWTP PLCs focuses on saving cost by consolidating to a fewer number of standardized processors with remote I/O to accommodate field terminations in the local (or adjacent) cabinets.

- We recommend that your team implement a common alarm notification at all your facilities. This will provide ease of use, troubleshooting, and repair for your engineer/technician. We suggest a level of redundancy in the alarm notification, so your staff will have an increase confidence that they are receiving all the necessary alarms.

4.2 Conclusion

The rankings of the Schneider Modicon/Wonderware and Rockwell Automation solutions are very close, while the Emerson Ovation solution did not rank as well with the District's criteria.

- Despite a higher life cycle cost, the Rockwell Automation solution scored higher in reliability, standardization and support. The fully integrated options associated with Rockwell Automation PlantPAx solution scored high in the evaluation. Additionally, the installation base and product lifecycle slightly differentiated Rockwell Automation from Schneider Modicon. We found that Rockwell Automation solutions provide high reliability, excellent long-term support with a high degree of vendor-supported standardization. The PlantPAx solution is a well-integrated solution for PLC and HMI functions, with all the support coming from one vendor.

- Schneider solutions provide cost-effective solutions with similar reliability. However, despite the improved cost, the District will sacrifice a level of standardization by choosing this option. There is not a vendor supported standardized platform, so the District will have a larger challenge of creating and managing the standardization during future upgrade projects. The rating for reliability, support and standardization were impacted slightly due to the fact that Modicon and Wonderware are both under the Schneider umbrella, but do not necessarily act as one entity in implementation or support. The hardware costs are less using the Modicon PLC hardware, but the SCADA software costs are comparable to the Rockwell Automation solution, as Wonderware System Platform implementation will require "ground-up" upgrade of the existing Wonderware applications.

- Additionally, we considered a Rockwell/Wonderware hybrid which leverages the reliability of the Rockwell Automation hardware and support while leveraging the existing Wonderware HMI installation. The scores show that this option ranks almost as high as the Rockwell Automation solution.

- If reliability is weighted as the highest priority, then Rockwell Automation solution is the preferred solution for the District. The District will need to decide if the added costs offset the differences identified.

- The next step for your District is to work with the selected SCADA vendor and develop standardized tags, objects, logic, and graphics. Implementing a standardized approach for all new, upgraded, or repaired sites will bring your District onto one common platform and one common approach for future projects and for ongoing maintenance of the system.

Appendix A

Decision Matrix

Evaluation Criteria	Importance Factor	Wonderware/Modicon		Wonderware/Rockwell		Rockwell Automation		Emerson Ovation	
		Ranking	Point Value	Ranking	Point Value	Ranking	Point Value	Ranking	Point Value
Operational Function & Reliability	5	7.75	38.75	7.75	38.75	8.25	41.25	6.25	31.25
Hardware Reliability	*5*	8	40	8	40	8	40	4	20
Software & Comm. Reliability	*5*	8	40	8	40	8	40	5	25
Standardized Logic	*5*	8	40	8	40	9	45	8	40
Alarm Management	*5*	7	35	7	35	8	40	8	40
Life-Cycle Costs	4	7.34	29.34	7.0	28	7.0	28	5.0	20
Initial costs	*4*	9	36	7	28	7	28	5	20
O&M support costs	*4*	7	28	7	28	7	28	5	20
Training costs	*4*	6	24	7	28	7	28	5	20
Ease of Use & Integration	3	7.67	23	8.0	24	8.0	24	6.34	19
Hardware replacement	*3*	7	21	8	24	8	24	6	18
Software development	*3*	8	24	8	24	8	24	7	21
Situational Awareness integrated	*3*	8	24	8	24	8	24	6	18
Long Term Support	3	7.75	23.25	8.25	24.75	8.5	25.5	6.5	19.5
Distributor Support	*3*	8	24	8	24	8	24	6	18
System Integrator Support	*3*	8	24	9	27	9	27	7	21
Availability of training	*3*	8	24	9	27	9	27	7	21
Vendor product life cycle	*3*	7	21	7	21	8	24	6	18
Totals			**114.34**		**115.5**		**118.75**		**89.75**

Appendix B

Life Cycle Comparative Cost Estimate

Life Cycle Cost Comparison		Total (Rockwell Automation)	Total (Rockwell - Wonderware)	Total (Schneider-Wonderware)	Total (Emerson Ovation)
Initial Software Costs		**$1,373,610**	**$1,313,410**	**$1,216,925**	**$1,537,333**
	PLC Hardware Estimates	$360,410	$360,410	$266,925	$273,833
	Tapia WWTP	$165,888	$165,888	$132,585	$107,310
	Water Ops	$136,734	$136,734	$96,669	$118,855
	Westlake Filter	$57,788	$57,788	$37,671	$47,668
	Software/Installation Estimates	$113,200	$53,000	$50,000	$133,500
	PLC Development Software	$7,200	$8,000	$5,000	
	SCADA Development Software	$6,000	$5,000	$5,000	
	SCADA Server/Client Software	$50,000	$25,000	$25,000	
	Alarm Notification	$10,000	$10,000	$10,000	
	Historian	$40,000	$5,000	$5,000	
	Engineering/Implementation Estimates	$900,000	$900,000	$900,000	$1,130,000
	Integration with upgraded PLCs	$750,000	$750,000	$750,000	
	Software Configuration/Duplication	$150,000	$150,000	$150,000	
O&M Software Costs		**$295,000**	**$345,000**	**$340,000**	**$385,000**
	SCADA Upgrades/Replacements (1 upgrade per 10 years)	$45,000	$45,000	$40,000	$55,000
	Common Spare PLC & I/O	$15,000	$15,000	$10,000	$10,000
	Server & workstation hardware upgrades/replacments	$10,000	$10,000	$10,000	$10,000
	Standard software upgrades	$20,000	$20,000	$20,000	$35,000
	SCADA Software Licensing/Support (10 years)	$250,000	$300,000	$300,000	$330,000
	PLC Support per year	$5,000	$5,000	$5,000	
	SCADA Support per year	$20,000	$25,000	$25,000	$33,000
	Totals	**$1,668,610**	**$1,658,410**	**$1,556,925**	**$1,922,333**

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Appendix C

Sample Cost Breakdown Tapia WWTP – Rockwell Automation & Schneider Modicon

LVMWD Cost Estimate Breakdown
Tapia WWTP
Schneider Modicon PLC Hardware

		New PLC			New PLC			New Backplane		# AI		New AI		# AO		New AO		# DI		New DI		# DO		New DO			New DI			New Enet/Misc		
	QTY	Processor	Price	QTY	Power Supply	Price	QTY	Module	Price		QTY	Module	Price		QTY	Module	Price		QTY	Module	Price		QTY	Module	Price	QTY	Module	Price	QTY	Module	Price	SubTotal
95 Centrate	1	BMXCRA31200	$661	1	CPS2000	$201	1	XBP1200	$209	8	1	AMI0810	$355	0				32	1	DDI3202K	$260	8	1	DRA0805	$160							$1,846
96 Centrate	1	P583040	$5,452	1	CPS2000	$201	1	XBP1200	$209	16	2	AMI0810	$355	16	4	AMO0410	$327	64	1	DDI6402K	$408	16	2	DRA0805	$160							$8,608
97 Centrate	1	BMXCRA31200	$661	1	CPS2000	$201	1	XBP1200	$209	4	1	AMI0810	$355	2	1	AMO0410	$327	4	1	DDI3202K	$260	2	3	DRA0805	$160							$2,493
5 Chemical	1	BMXCRA31200	$661	1	CPS2000	$201	1	XBP1200	$209	8	1	AMI0810	$355	4	1	AMO0410	$327	16	1	DDI1602	$136	8	1	DRA0805	$160							$2,049
25 Chemical	1	P583040	$5,452	1	CPS2000	$201	1	XBP1200	$209	12	2	AMI0810	$355	4	1	AMO0410	$327	48	2	DDI3202K	$260	24	3	DRA0805	$160							$7,899
37 Chemical	1	BMXCRA31200	$661	1	CPS2000	$201	1	XBP1200	$209	8	1	AMI0810	$355	8	2	AMO0410	$327	32	1	DDI3202K	$260	16	2	DRA0805	$160							$2,660
38 Chemical	1	BMXCRA31200	$661	1	CPS2000	$201	1	XBP1200	$209	8	1	AMI0810	$355	4	1	AMO0410	$327	32	1	DDI3202K	$260	16	2	DRA0805	$160							$2,333
39 Chemical	1	BMXCRA31200	$661	1	CPS2000	$201	1	XBP1200	$209	8	1	AMI0810	$355	8	2	AMO0410	$327	32	1	DDI3202K	$260	16	2	DRA0805	$160							$2,660
6 Control	1	P342020	$1,121	1	CPS2000	$201	1	XBP0800	$129	24	3	AMI0810	$355	2	1	AMO0210	$271	16	1	DDI1602	$136	16	1	DDO1602	$164							$3,087
2 CP100	1	BMXCRA31200	$661	1	CPS2000	$201	1	XBP1200	$209	20	3	AMI0810	$355	12	3	AMO0410	$327	80	1	DDI6402K	$408	40	3	DRA1605	$209	1	DDI3202K	$260				$4,412
33 CP100	1	P583040	$5,452	1	CPS2000	$201	1	XBP1200	$209	12	2	AMI0810	$355	0				160	3	DDI6402K	$408	16	1	DRA1605	$209							$8,005
34 CP100	1	BMXCRA31200	$661	1	CPS2000	$201	1	XBP1200	$209	16	2	AMI0810	$355	16	4	AMO0410	$327	64	1	DDI6402K	$408	16	1	DRA1605	$209							$3,706
35 CP100	1	BMXCRA31200	$661	1	CPS2000	$201	1	XBP1200	$209	20	3	AMI0810	$355	12	3	AMO0410	$327	16	1	DDI1602	$136	8	1	DRA0805	$160							$3,413
1 CP1000	1	BMXCRA31200	$661	1	CPS2000	$201	1	XBP0800	$209	8	1	AMI0810	$355	10	3	AMO0410	$327	32	1	DDI3202K	$260	16	1	DRA1605	$209							$2,876
7 CP1000	1	P583040	$5,452	1	CPS2000	$201	1	XBP1200	$209	24	3	AMI0810	$355	0				96	1	DDI6402K	$408	8	1	DRA0805	$160	1	DDI3202K	$260				$7,755
9 CP1000	1	BMXCRA31200	$661	1	CPS2000	$201	1	XBP0800	$129	20	3	AMI0810	$355	8	2	AMO0410	$327	0				16	1	DRA1605	$209							$2,919
29 CP1000	1	BMXCRA31200	$661	1	CPS2000	$201	1	XBP0800	$129	16	2	AMI0810	$355	4	1	AMO0410	$327	48	1	DDI3202K	$260	16	1	DRA1605	$209	1	DDI1602	$136				$2,633
36 CP1000	1	BMXCRA31200	$661	1	CPS2000	$201	1	XBP0800	$129	0				0				64	1	DDI6402K	$408	0										$1,399
3 Effluent	1	P342020	$1,121	1	CPS2000	$201	1	XBP0800	$129	12	2	AMI0810	$355	4	1	AMO0410	$327	32	1	DDI3202K	$260	8	1	DRA0805	$160							$2,908
41 Effluent PS	1	P342020	$1,121	1	CPS2000	$201	1	XBP0800	$129	16	2	AMI0810	$355	0	1	AMO0410	$327	0	0	DDI3202K	$260	0	0	DRA0805	$160							$2,488
4 Filters	1	P342020	$1,121	1	CPS2000	$201	1	XBP0600	$97	24	3	AMI0810	$355	0				16	1	DDI1602	$136	8	1	DRA0805	$160							$2,780
10 Filters	1	P342020	$1,121	1	CPS2000	$201	1	XBP0600	$97	0				0				24	2	DAI1602	$136	16	1	DRA1605	$209							$1,900
11 Filters	1	P342020	$1,121	1	CPS2000	$201	1	XBP0600	$97	4	1	AMI0410	$325	2	1	AMO0210	$271	24	2	DAI1602	$136	16	1	DRA1605	$209							$2,496
12 Filters	1	P342020	$1,121	1	CPS2000	$201	1	XBP0600	$97	4	1	AMI0410	$325	2	1	AMO0210	$271	24	2	DAI1602	$136	16	1	DRA1605	$209							$2,496
13 Filters	1	P342020	$1,121	1	CPS2000	$201	1	XBP0600	$97	4	1	AMI0410	$325	2	1	AMO0210	$271	24	2	DAI1602	$136	16	1	DRA1605	$209							$2,496
14 Filters	1	P342020	$1,121	1	CPS2000	$201	1	XBP0600	$97	4	1	AMI0410	$325	2	1	AMO0210	$271	24	2	DAI1602	$136	16	1	DRA1605	$209							$2,496
15 Filters	1	P342020	$1,121	1	CPS2000	$201	1	XBP0600	$97	4	1	AMI0410	$325	2	1	AMO0210	$271	24	2	DAI1602	$136	16	1	DRA1605	$209							$2,496
16 Filters	1	P342020	$1,121	1	CPS2000	$201	1	XBP0600	$97	4	1	AMI0410	$325	2	1	AMO0210	$271	24	2	DAI1602	$136	16	1	DRA1605	$209							$2,496
17 Filters	1	P342020	$1,121	1	CPS2000	$201	1	XBP0600	$97	4	1	AMI0410	$325	2	1	AMO0210	$271	24	2	DAI1602	$136	16	1	DRA1605	$209							$2,496
18 Filters	1	P342020	$1,121	1	CPS2000	$201	1	XBP0600	$97	4	1	AMI0410	$325	2	1	AMO0210	$271	24	2	DAI1602	$136	16	1	DRA1605	$209							$2,496
19 Filters	1	P342020	$1,121	1	CPS2000	$201	1	XBP0600	$97	4	1	AMI0410	$325	2	1	AMO0210	$271	24	2	DAI1602	$136	16	1	DRA1605	$209							$2,496
20 Filters	1	P342020	$1,121	1	CPS2000	$201	1	XBP0600	$97	4	1	AMI0410	$325	2	1	AMO0210	$271	24	2	DAI1602	$136	16	1	DRA1605	$209							$2,496
21 Filters	1	P342020	$1,121	1	CPS2000	$201	1	XBP0600	$97	4	1	AMI0410	$325	2	1	AMO0210	$271	24	2	DAI1602	$136	16	1	DRA1605	$209							$2,496
22 Filters	1	P342020	$1,121	1	CPS2000	$201	1	XBP0600	$97	4	1	AMI0410	$325	2	1	AMO0210	$271	24	2	DAI1602	$136	16	1	DRA1605	$209							$2,496
8 Force Main 2	1	P342020	$1,121	1	CPS2000	$201	1	XBP1200	$209	8	1	AMI0810	$355	2	1	AMO0210	$271	64	1	DDI6402K	$408	72	5	DAO1605	$209							$3,610
26 Headworks	1	P583040	$5,452	1	CPS2000	$201	1	XBP0800	$129	12	2	AMI0810	$355	0				32	1	DDI3202K	$260	8	1	DRA0805	$160							$6,912
27 Headworks	1	BMXCRA31200	$661	1	CPS2000	$201	1	XBP0600	$97	4	1	AMI0410	$325	0				16	1	DDI1602	$136	8	1	DRA0805	$160							$1,580
28 Headworks	1	BMXCRA31200	$661	1	CPS2000	$201	1	XBP0600	$97	4	1	AMI0410	$325	0				16	1	DDI1602	$136	8	1	DRA0805	$160							$1,580
23 Lift Station 1	1	P342020	$1,121	1	CPS2000	$201	1	XBP0800	$129	12	4	AMI0810	$355	4	1	AMO0410	$327	32	2	DAI1602	$136	8	1	DRA0805	$160				1	ART414 RTD	$431	$4,061
41 Lift Station 1		Incoporated in PLC 23								16				0				0				0										$0
24 Lift Station 2	1	P342020	$1,121	1	CPS2000	$201	1	XBP0800	$129	12	4	AMI0810	$355	4	1	AMO0410	$327	32	2	DAI1602	$136	8	1	DRA0805	$160				1	ART414 RTD	$431	$4,061
42 Lift Station 2		Incoporated in PLC 24								16				0				0				0										$0
																																$132,585

LVMWD Cost Estimate Breakdown
Tapia WWTP
Rockwell Automation PLC Hardware

		New PLC			New PLC			New Backplane		# AI		New AI		# AO		New AO		# DI		New DI		# DO		New DO			New Misc			New Enet/Misc			
		QTY	Processor	Price	QTY	Power Supply	Price	QTY	Module	Price		QTY	Module	Price		QTY	Module	Price		QTY	Module	Price		QTY	Module	Price	QTY	Module	Price	QTY	Module	Price	SubTotal
95	Centrate	1	1794-AENT	$584	1	1794-PS13	$176		N/A		8	1	1794-IE8	$355	0				32	1	1794-IB32	$417	8	1	1794-OW8	$297	3	1794-TB3	$163				$2,318
96	Centrate	1	1769-L33ER	$2,384	1	1769-PA2	$230		N/A		16	2	1769-IF8	$655	16	4	1769-OF4	$634	64	2	1769-IQ32	$356	16	1	1769-OW16	$160	1	1769-ECR	$30				$7,362
97	Centrate	1	1794-AENT	$584	1	1794-PS13	$176		N/A		4	1	1794-IE8	$355	2	1	1794-OE12	$1,673	4	1	1794-IB32	$417	2	1	1794-OW8	$297	4	1794-TB3	$163				$4,154
5	Chemical	1	1794-AENT	$584	1	1794-PS13	$176		N/A		8	1	1794-IE8	$355	4	1	1794-OE12	$1,673	16	1	1794-IB32	$417	8	1	1794-OW8	$297	4	1794-TB3	$163				$4,154
25	Chemical	1	1769-L33ER	$2,384	1	1769-PA2	$230		N/A		12	2	1769-IF8	$655	4	1	1769-OF4	$634	48	2	1769-IQ32	$356	24	2	1769-OW16	$160	1	1769-ECR	$30				$5,620
37	Chemical	1	1794-AENT	$584	1	1794-PS13	$176		N/A		8	1	1794-IE8	$355	8	1	1794-OE12	$1,673	32	1	1794-IB32	$417	16	2	1794-OW8	$297	5	1794-TB3	$163				$4,614
38	Chemical	1	1794-AENT	$584	1	1794-PS13	$176		N/A		8	1	1794-IE8	$355	4	1	1794-OE12	$1,673	32	1	1794-IB32	$417	16	2	1794-OW8	$297	5	1794-TB3	$163				$4,614
39	Chemical	1	1794-AENT	$584	1	1794-PS13	$176		N/A		8	1	1794-IE8	$355	8	1	1794-OE12	$1,673	32	1	1794-IB32	$417	16	2	1794-OW8	$297	5	1794-TB3	$163				$4,614
6	Control	1	1769-L33ER	$2,384	1	1769-PA2	$230		N/A		24	3	1769-IF8	$655	2	1	1769-OF4	$634	16	1	1769-IQ32	$356	16	1	1769-OW16	$160							$5,729
2	CP100	1	1794-AENT	$584	1	1794-PS13	$176		N/A		20	3	1794-IE8	$355	12	1	1794-OE12	$1,673	80	3	1794-IB32	$417	40	5	1794-OW8	$297	12	1794-TB3	$163				$8,190
33	CP100	1	1769-L33ER	$2,384	1	1769-PA2	$230		N/A		12	2	1769-IF8	$655	0				160	5	1769-IQ32	$356	16	1	1769-OW16	$160	1	1769-ECR	$30				$5,894
34	CP100	1	1794-AENT	$584	1	1794-PS13	$176		N/A		16	2	1794-IE8	$355	16	2	1794-OE12	$1,673	64	2	1794-IB32	$417	16	2	1794-OW8	$297	8	1794-TB3	$163				$7,548
35	CP100	1	1794-AENT	$584	1	1794-PS13	$176		N/A		20	3	1794-IE8	$355	12	1	1794-OE12	$1,673	16	1	1794-IB32	$417	8	1	1794-OW8	$297	6	1794-TB3	$163				$5,190
1	CP1000	1	1794-AENT	$584	1	1794-PS13	$176		N/A		8	1	1794-IE8	$355	10	1	1794-OE12	$1,673	32	1	1794-IB32	$417	16	2	1794-OW8	$297	5	1794-TB3	$163				$4,614
7	CP1000	1	1769-L33ER	$2,384	1	1769-PA2	$230		N/A		24	3	1769-IF8	$655	0				96	3	1769-IQ32	$356	8	1	1769-OW16	$160	1	1769-ECR	$30				$5,837
9	CP1000	1	1794-AENT	$584	1	1794-PS13	$176		N/A		20	3	1794-IE8	$355	8	1	1794-OE12	$1,673	0				16	2	1794-OW8	$297	6	1794-TB3	$163				$5,070
29	CP1000	1	1794-AENT	$584	1	1794-PS13	$176		N/A		16	2	1794-IE8	$355	4	1	1794-OE12	$1,673	48	2	1794-IB32	$417	16	2	1794-OW8	$297	7	1794-TB3	$163				$5,712
36	CP1000	1	1794-AENT	$584	1	1794-PS13	$176		N/A		0				0				64	2	1794-IB32	$417	0				2	1794-TB3	$163				$1,920
3	Effluent	1	1769-L33ER	$2,384	1	1769-PA2	$230		N/A		12	1	1769-IF8	$655	4	1	1769-OF4	$634	32	1	1769-IQ32	$356	8	1	1769-OW16	$160	1	1769-ECR	$30				$4,449
41	Effluent PS	1	1794-AENT	$584	1	1794-PS13	$176		N/A		16	2	1794-IE8	$355	0				0				0				2	1794-TB3	$163				$1,796
4	Filters	1	1769-L24ER-QBFC1B	$2,153		Built-in L24			N/A		24	3	1769-IF8	$655	2		Built-in L24		16		Built-in L24		8		Built-in L24		1	1769-ECR	$30				$4,148
10	Filters	1	1769-L24ER-QBFC1B	$2,153		Built-in L24			N/A		4		Built-in L24		2		Built-in L24		24	1	1769-IB16	$258	16		Built-in L24								$2,411
11	Filters	1	1769-L24ER-QBFC1B	$2,153		Built-in L24			N/A		4		Built-in L24		2		Built-in L24		24	1	1769-IB16	$258	16		Built-in L24								$2,411
12	Filters	1	1769-L24ER-QBFC1B	$2,153		Built-in L24			N/A		4		Built-in L24		2		Built-in L24		24	1	1769-IB16	$258	16		Built-in L24								$2,411
13	Filters	1	1769-L24ER-QBFC1B	$2,153		Built-in L24			N/A		4		Built-in L24		2		Built-in L24		24	1	1769-IB16	$258	16		Built-in L24								$2,411
14	Filters	1	1769-L24ER-QBFC1B	$2,153		Built-in L24			N/A		4		Built-in L24		2		Built-in L24		24	1	1769-IB16	$258	16		Built-in L24								$2,411
15	Filters	1	1769-L24ER-QBFC1B	$2,153		Built-in L24			N/A		4		Built-in L24		2		Built-in L24		24	1	1769-IB16	$258	16		Built-in L24								$2,411
16	Filters	1	1769-L24ER-QBFC1B	$2,153		Built-in L24			N/A		4		Built-in L24		2		Built-in L24		24	1	1769-IB16	$258	16		Built-in L24								$2,411
17	Filters	1	1769-L24ER-QBFC1B	$2,153		Built-in L24			N/A		4		Built-in L24		2		Built-in L24		24	1	1769-IB16	$258	16		Built-in L24								$2,411
18	Filters	1	1769-L24ER-QBFC1B	$2,153		Built-in L24			N/A		4		Built-in L24		2		Built-in L24		24	1	1769-IB16	$258	16		Built-in L24								$2,411
19	Filters	1	1769-L24ER-QBFC1B	$2,153		Built-in L24			N/A		4		Built-in L24		2		Built-in L24		24	1	1769-IB16	$258	16		Built-in L24								$2,411
20	Filters	1	1769-L24ER-QBFC1B	$2,153		Built-in L24			N/A		4		Built-in L24		2		Built-in L24		24	1	1769-IB16	$258	16		Built-in L24								$2,411
21	Filters	1	1769-L24ER-QBFC1B	$2,153		Built-in L24			N/A		4		Built-in L24		2		Built-in L24		24	1	1769-IB16	$258	16		Built-in L24								$2,411
22	Filters	1	1769-L24ER-QBFC1B	$2,153		Built-in L24			N/A		4		Built-in L24		2		Built-in L24		24	1	1769-IB16	$258	16		Built-in L24								$2,411
8	Force Main 2	1	1769-L33ER	$2,384	1	1769-PA2	$230		N/A		8	1	1769-IF8	$655	2	1	1769-OF4	$634	64	4	1769-IA16	$325	72	4	1769-OA16	$369	1	1769-ECR	$30				$6,709
26	Headworks	1	1769-L33ER	$2,384	1	1769-PA2	$230		N/A		12	1	1769-IF8	$655	0				32	3	1769-IQ32	$356	8	1	1769-OW16	$160	1	1769-ECR	$30				$4,527
27	Headworks	1	1794-AENT	$584	1	1794-PS13	$176		N/A		4	1	1794-IE8	$355	0				16	1	1794-IB32	$417	8	1	1794-OW8	$297	3	1794-TB3	$163				$2,318
28	Headworks	1	1794-AENT	$584	1	1794-PS13	$176		N/A		4	1	1794-IE8	$355	0				16	1	1794-IB32	$417	8	1	1794-OW8	$297	3	1794-TB3	$163				$2,318
23	Lift Station 1	1	1769-L33ER	$2,384	1	1769-PA2	$230		N/A		28	4	1769-IF8	$655	4	1	1769-OF4	$634	32	2	1769-IA16	$325	8	1	1769-OW16	$160				1	1769-IR6	$885	$7,563
41	Lift Station 1		Incorporated into PLC 23						N/A		0				0				0				0										$0
24	Lift Station 2	1	1769-L33ER	$2,384	1	1769-PA2	$230		N/A		28	4	1769-IF8	$655	4	1	1769-OF4	$634	32	2	1769-IA16	$325	8	1	1769-OW16	$160				1	1769-IR6	$885	$7,563
42	Lift Station 2		Incorporated into PLC 24						N/A		0				0				0				0										$0
																																$165,888

June 26, 2018 LVMWD Regular Board Meeting

TO: Board of Directors

FROM: Resource Conservation & Public Outreach

Subject : Resolution in Support of the Water Supply and Water Quality Act of 2018

SUMMARY:

The State Water Supply Infrastructure, Water Conveyance, Ecosystem and Watershed Protection and Restoration, and Drinking Water Protection Act of 2018, also known as the Water Supply and Water Quality Act of 2018, would provide significant grants that can help fund a variety of water infrastructure projects and programs, including the Pure Water Project Las Virgenes-Triunfo. Adoption of a resolution in support of the bond measure that will be on the November 6, 2018 ballot will permit staff to begin efforts to educate customers on the benefits of the Act.

RECOMMENDATION(S):

Pass, approve, and adopt Resolution No. 2536, expressing support for the Water Supply and Water Quality Act of 2018.

RESOLUTION NO. 2536

A RESOLUTION OF THE BOARD OF DIRECTORS OF LAS VIRGENES MUNICIPAL WATER DISTRICT IN SUPPORT OF THE WATER SUPPLY INFRASTRUCTURE, WATER CONVEYANCE, ECOSYSTEM AND WATERSHED PROTECTION AND RESTORATION, AND DRINKING WATER PROTECTION ACT OF 2018

(Reference is hereby made to Resolution No. 2536 on file in the District's Resolution Book and by this reference the same is incorporated herein.)

FISCAL IMPACT:

No

ITEM BUDGETED:

No

FINANCIAL IMPACT:

There is no fiscal impact associated with expressing support for the bond measure.

DISCUSSION:

On June 12, 2018, the Board authorized staff to prepare a Resolution in support of the Water Supply and Water Quality Act of 2018. The bond measure includes $400 million in funding for water recycling projects. Passage of the bond measure on the November 6, 2018 statewide ballot would provide the District and its JPA with the opportunity to compete for significant grant funds that could help pay for water infrastructure projects and programs, including the Pure Water Project Las Virgenes-Triunfo. Upon adoption of the attached Resolution by the Board, staff will begin efforts to educate customers on the benefits of the Act should it be passed by the voters.

GOALS:

Sustain Community Awareness and Support

Providing factual information on the benefits of the Water Quality and Water Supply Act of 2018 will assist the District's customers in making an informed decision as to whether to support or oppose the measure on the November 6, 2018 ballot.

Prepared by: Joe McDermott, Director of Resource Conservation and Public Outreach

ATTACHMENTS:

Resolution No. 2536

RESOLUTION NO. 2536

A RESOLUTION OF THE BOARD OF DIRECTORS OF LAS VIRGENES MUNICIPAL WATER DISTRICT IN SUPPORT OF THE WATER SUPPLY INFRASTRUCTURE, WATER CONVEYANCE, ECOSYSTEM AND WATERSHED PROTECTION AND RESTORATION, AND DRINKING WATER PROTECTION ACT OF 2018

WHEREAS, California faces a growing list of challenges associated with aging infrastructure, natural disasters, climate change, population growth and other factors; and

WHEREAS, Las Virgenes Municipal Water District is entirely dependent upon imported resources for its potable water supply; and

WHEREAS, the water community and top leaders including Governor Brown agree that funding is needed to improve water supply reliability and ecosystem health throughout the State of California; and

WHEREAS, a diverse group of stakeholders including water managers has developed the State Water Supply Infrastructure, Water Conveyance, Ecosystem and Watershed Protection, and Drinking Water Protection Act of 2018, also more commonly known and referred to as the "November Bond", "Jerry Meral Bond", or here forth as the "Water Supply and Water Quality Act of 2018"; and

WHEREAS, sufficient signatures were collected to place a bond measure for the Water Supply and Water Quality Act of 2018 on the statewide ballot for consideration by California voters, which will provide much-needed funding to advance statewide water supply and water quality projects; and

WHEREAS, if approved by voters, the measure would provide $8.877 billion in General Obligation bond funding for a wide variety of water supply and water quality enhancement projects, including $400 million in funding for water recycling projects that could provide a grant to help pay for costs associated with the Pure Water Project Las Virgenes – Triunfo, which will help ensure safe and reliable water for customers in the Las Virgenes Municipal Water District service area; and

WHEREAS, the Association of California Water Agencies formally supports the Water Supply and Water Quality Act of 2018 in that it will help ensure safe and reliable water for communities throughout the State of California

well into the future.

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors of Las Virgenes Municipal Water District expresses its formal support for the Water Supply and Water Quality Act of 2018 on the November 6, 2018 ballot.

PASSED, **APPROVED,** AND **ADOPTED** on June 26, 2018.

_____
President

ATTEST:

_____
Secretary

APPROVED AS TO FORM:

_____
District Counsel

ITEM 8B

INFORMATION ONLY

June 26, 2018 LVMWD Regular Board Meeting

TO: Board of Directors

FROM: Resource Conservation & Public Outreach

Subject : Celebration of District's 60th Anniversary: Title Sponsorship of Reyes Adobe Days

SUMMARY:

For the past several months, staff has been seeking opportunities to celebrate the District's 60th anniversary and show gratitude for the many partnerships that have supported the District in providing excellent service to its customers over the years. Reyes Adobe Days, held in the City of Agoura Hills from October 11th through 14th, was identified as an ideal event for this purpose due to its focus on the history of the region and the large number of District customers who normally attend. Additionally, the timing of the event coincides with the anniversary of the formation of the Las Virgenes Citizens Committee for Water in October 1958 by Agoura's Postmaster Robert Boyd. The Citizens Committee was instrumental in garnering support for the District to join Metropolitan Water District of Southern California on October 11, 1960.

Staff recommends that the District participate in Reyes Adobe Days as a title sponsor, in the amount of $10,000.

RECOMMENDATION(S):

Authorize participation in Reyes Adobe Days, held from October 11 through 14, 2018, as a title sponsor, in the amount of $10,000.

FISCAL IMPACT:

Yes

ITEM BUDGETED:

Yes

FINANCIAL IMPACT:

Sufficient funds are available in the adopted Fiscal Year 2018-19 Budget for sponsorship of this event.

DISCUSSION:

Reyes Adobe Days is an ideal event to celebrate the District's 60th Anniversary and its theme of recognizing "partners in service". The District's participation in the event as a title sponsor would provide an opportunity to “piggyback” on an existing well-attended festival without expending the time and resources associated with a separate District event. The District has participated in Reyes Adobe Days as sponsor for many years but has not previously been a title sponsor.

The event is a four-day celebration from October 11 through 14, 2018. As a title sponsor, the District will be provided a role in the event's major activities, including a featured spot at the Night at the Adobe on Friday and the parade on Saturday. Also, the District will receive publicity as a title sponsor through direct mailings, social media, press releases, banners, brochures and fliers.

GOALS:

Sustain Community Awareness and Support

Being a title sponsor at the event will help the District achieve several of its objectives as outlined in the Strategic Plan, including promoting, encouraging and supporting efficient water use. The event will also provide opportunities to engage with customers on the Pure Water Project Las Virgenes-Triunfo, the District's water conservation programs and other major undertakings. Sponsorship at the recommended level will also showcase the District's continued commitment to serving as a community partner.

Prepared by: Joe McDermott and Mike McNutt, Resource Conservation and Public Outreach

ITEM 9A

INFORMATION ONLY

June 26, 2018 LVMWD Regular Board Meeting

TO: Board of Directors

FROM: General Manager

Subject : Los Angeles County Safe, Clean Water Program Funding Measure

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SUMMARY:

On July 10, 2018, the Los Angeles County Board of Supervisors will hold a public hearing to consider placing a funding measure on the November 6, 2018 Ballot for it proposed Safe, Clean Water Program. The program is intended to implement stormwater projects and programs that improve water quality, increase water supplies and enhance communities. Attached for reference is a copy of the County's fact sheet for the Safe, Clean Water Program.

The funding measure consists of a parcel tax, in the amount of $0.025 per square foot of impermeable area, assessed on private properties within the Los Angeles County Flood Control District, excluding the Antelope Valley. If passed by a two-thirds vote, the tax would generate approximately $300 million annually for the County of Los Angeles. The funds would be allocated 10% to a District Program, 40% to a Municipal Program and 50% to a Regional Program.

At the Board meeting, staff will be prepared to provide additional information on the proposed funding measure and comments provided to-date by water agency stakeholders, including the District.

FISCAL IMPACT:

No

ITEM BUDGETED:

No

Prepared by: David W. Pedersen, General Manager

ATTACHMENTS:

County Fact Sheet on Safe, Clean Water Program

What is the Safe, Clean Water Program?

PROGRAM OVERVIEW[1]

The Safe, Clean Water Program will implement stormwater projects and programs that improve water quality, increase water supply, and invest in communities by developing a skilled local work force, greening schools, parks and wetlands, and increasing public access to natural areas like rivers, lakes, and streams.

The program will fund the construction and maintenance of projects that:

- Protect public health by cleaning stormwater pollution and contamination
- Safeguard marine and other wildlife from trash and contaminants in stormwater runoff
- Mitigate severe drought impacts by increasing local water supply
- Update infrastructure to capture and treat stormwater
- Help cities meet their Clean Water Act obligation to clean stormwater

Image: *Dominguez Gap Wetlands*

The program prioritizes projects that use nature-based solutions to capture and clean stormwater, which can beautify communities while improving our resilience against extreme weather patterns of drought and heavy storms.

PROGRAM PRINCIPLES

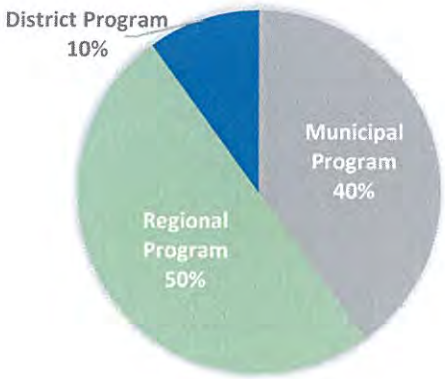
- Promote equity and inclusion for all communities in LA County
- Invest in local job training and employment
- Leverage other funding sources to maximize returns on investment
- Provide strong oversight to measure and ensure Program results over time
- Engage stakeholders throughout the region in developing projects
- Ensure fiscal accountability for the program and projects
- Provide multiple benefits – for instance, improving water quality while managing flood risk

FUNDING MECHANISM

The program is funded through a parcel tax on private property owners in the LA County Flood Control District. The tax is based on a property's total area of paved or built (impermeable) surface, where rain cannot infiltrate into the ground and runs off into the street. Currently under discussion are options for crediting those who already capture stormwater, and incentivizing others who want to do more.

[1] *The information described on this document reflects the Draft Safe, Clean Water Program Elements currently under consideration by the LA County Department of Public Works and undergoing review by stakeholders and the public. The Board of Supervisors is expected to consider adoption of an ordinance to finalize Program details at their meeting on June 26, 2018.*

FUNDING BREAKDOWN



Municipal Program - 40% of the program funds return directly to cities and unincorporated areas.

- The 'local return' is proportionate to what parcels within a city or municipality paid into the program, and is designed to maximize flexibility for local governments to address local concerns.
- Projects are required to have a water quality benefit and are strongly encouraged to incorporate additional benefits, including increased water supply and community investments.
- Cities and municipalities can use up to 30% of their local return revenues to pay for water quality activities that existed prior to commencement of the SCW Program.

Regional Program - 50% of revenues to fund watershed-based projects with regional benefits.

- Revenues are returned proportionally to each of nine Watershed Areas (on the righthand map), with Steering Committees allocating funding for projects.
- A percentage of funds reserved for small-budget, small-scale projects at the parcel and neighborhood level.
- Revenues generated by disadvantaged communities will return to those communities, plus an additional sum to jumpstart investment.
- Regional Program funds will also be set aside for scientific studies and technical assistance; activities like special studies, monitoring, modeling, project feasibility study development, and providing technical resources for community groups, disadvantaged communities, nonprofits, and community-based organizations.

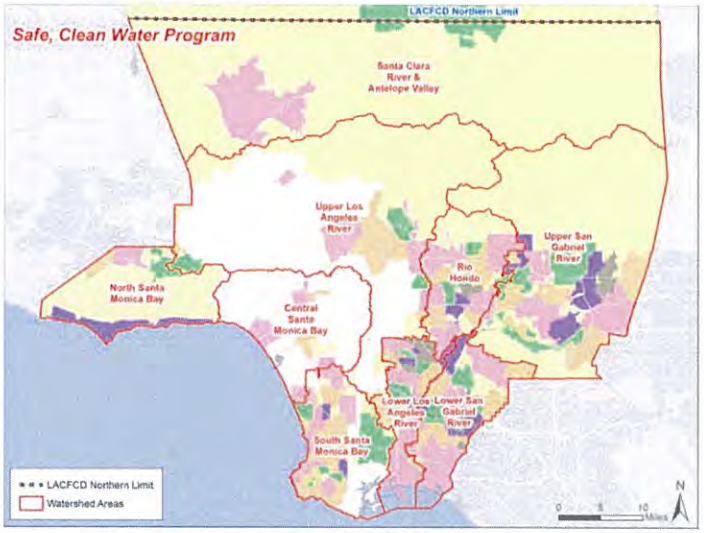


Image: *Watershed Areas for the Safe, Clean Water Program*

District Program - 10% of revenues to the LA County Flood Control District.

- Funds will go toward development of programs in concert with stakeholders and community groups, and may include:
  - Schools programming and curriculum
  - Local workforce job training, including certification classes and vocational training
  - Watershed coordinators to provide resources, educational workshops, partnership opportunities, and networking for communities
  - Public education program (individualized for different communities)
- This Program will fund specific FCD projects.
- FCD to perform overall administration of the Safe, Clean Water Program

ITEM 9B

INFORMATION ONLY

June 26, 2018 LVMWD Regular Board Meeting

TO: Board of Directors

FROM: Facilities & Operations

Subject : Community Choice Aggregation: Clean Power Alliance

SUMMARY:

California Assembly Bill 117 (2002) enabled municipalities and regional governments to establish community choice aggregation programs to buy and/or generate electricity for its residents and businesses. The Clean Power Alliance is a joint powers authority created to serve as the community choice aggregator for Los Angeles and Ventura Counties. Participation in aggregator-developed programs is optional for customers; however, enrollment in the program is automatic unless customers opt out.

Attached is a fact sheet with more information on the Clean Power Alliance.

FISCAL IMPACT:

No

ITEM BUDGETED:

No

FINANCIAL IMPACT:

There is no financial impact at this time. However, future participation in the Clean Power Alliance energy rate options could result in a cost-savings to the District.

DISCUSSION:

The passage of California Assembly Bill 117 in 2002 enabled municipalities and regional governments to establish community choice aggregation programs in areas where municipal power agencies are not already operating. Community choice aggregation is a program that

allows cities and counties to buy and/or generate electricity for its residents and businesses. The concept was implemented as a means to expand the availability of renewable energy (solar and wind) rate options beyond those provided by traditional energy suppliers.

Following are the characteristics of community choice aggregation programs:

- Participation in community choice aggregation programs is optional.
- Enrollment in community choice aggregations programs is automatic; customers are required to opt out, if desired, rather than sign up.
- The current utility provider (SCE) continues to provide the energy transmission, maintenance and billing functions to customers.
- Community choice aggregation program rate options have higher renewable energy content than current SCE offerings and advertise estimated cost-savings or increases based on the renewable energy content of the selected rate option.

Within District's service area, the Clean Power Alliance was formed to administer the local community choice aggregation program. The Clean Power Alliance is a joint powers authority made up of 31 public agencies across Los Angeles and Ventura Counties, including the County of Los Angeles, City of Agoura Hills and City of Calabasas. The District has SCE service accounts in each of these jurisdictions, allowing participation in energy rate options offered by the Clean Power Alliance within those jurisdictions.

The initial program offering from the Clean Power Alliance begins on June 25, 2018 and is available for commercial and industrial accounts in the unincorporated areas of Los Angeles County. The SCE account for the Tapia Water Reclamation Facility was identified by the Clean Power Alliance to automatically transition to a Clean Power Alliance rate option unless the District opts out. Additionally, thirteen other District SCE accounts in the unincorporated area will eventually transition to Clean Power Alliance rate options.

At this time, staff proposes that the District opt out of the Clean Power Alliance rate options, pending a more thorough analysis of the potential impacts to the District's existing and planned power arrangements with SCE. Specifically, staff is seeking assurances that participation in the community choice aggregation program will not jeopardize any of the following:

- The District's existing 1.0 MW solar power purchase agreement.
- The proposed SCE rebate and incentive for the Process Air Improvements Project at the Tapia Water Reclamation Facility.
- The proposed participation in the Renewable Self-Generation Bill Credit Transfer (RES-BCT) rate tariff for expansion of the existing solar facility.

Staff met with a representative from the Clean Power Alliance on June 5, 2018 to discuss these issues, which make the decision to participate in the community choice aggregation program more complex than for a typical SCE customer. Based on the discussion, the Clean Power Alliance representative concurred with District staff that it would be prudent to opt out of the community choice aggregation program until SCE and the Clean Power Alliance can definitively address the District's potential concerns. Once more information is available, the District can then enroll in the program.

To maintain status quo operations for energy purchases, staff opted out of the community choice aggregation program offered through the Clean Power Alliance for SCE Service Account No. 3000436856 (Tapia Water Reclamation Facility). Staff will continue to evaluate

this opportunity for potential future participation.

GOALS:

Ensure Effective Utilization of the Public's Assets and Money

Prepared by: Doug Anders, Administrative Services Coordinator

ATTACHMENTS:

Clean Power Alliance Fact Sheet

CLEAN POWER ALLIANCE

Clean Renewable Energy at Competitive Rates

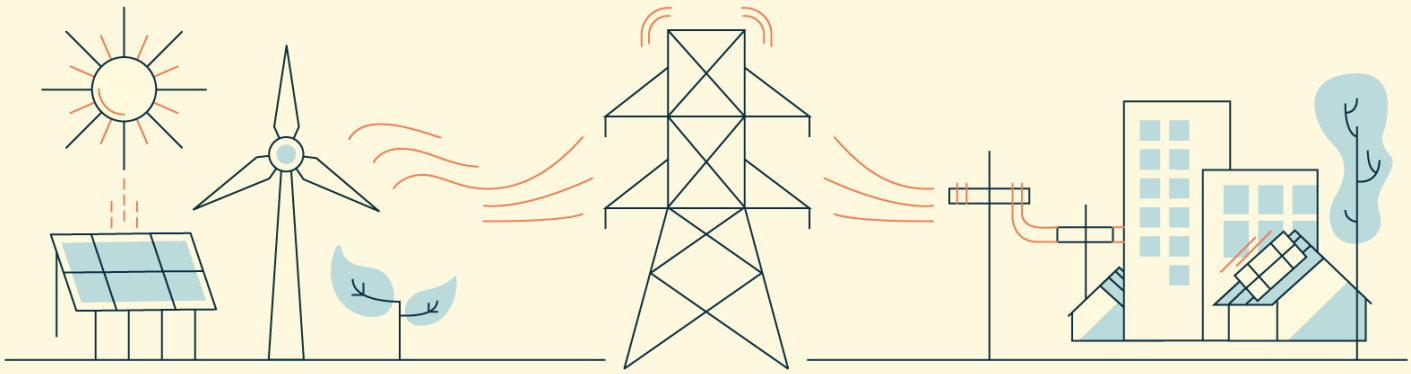
Starting June 25th, 2018, the Clean Power Alliance will become your energy partner by providing electricity procurement services for businesses in your area, leveraging the combined purchasing power of our member agencies to offer clean renewable energy for less than you're paying now.

Who are we?

Clean Power Alliance is a nonprofit entity, formed through a Joint Powers Authority (JPA) made up of 31 public agencies across Los Angeles and Ventura counties. Locally governed by the members and staffed by a team of industry experts, Clean Power Alliance is actively assembling a portfolio of energy resources that reduces costs and provides renewable energy opportunities – and best of all you have choices.

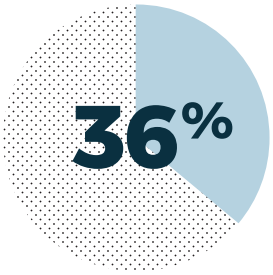
How does it work?

Clean Power Alliance works like other agencies of its type in California, assembling a renewable energy portfolio from the open market and delivering via Southern California Edison (SCE) who is paid to deliver power to your business, handle billing, and resolve service issues.

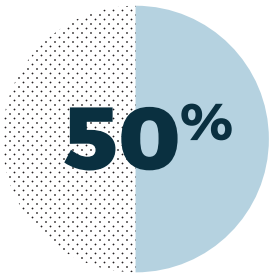


source	delivery	customer
Clean Power Alliance	**SCE**	**You**
buying electricity supply	delivering energy, maintaining lines, billing customers	benefitting from affordable rates, more choices, cleaner energy

Clean Power Alliance currently offers three rate options designed to suit the diverse needs of our businesses*:



36% renewable energy that is **3% cheaper** than Southern California Edison's base rates



50% renewable energy that costs on average **2-3% less** than Southern California Edison's base rates

100% renewable energy that is at least **5% more affordable** in comparison to Southern California Edison's green rate

**Savings estimates are based on 2018 Clean Power Alliance rates relative to SCE rates as of January 2018*

The choice is yours!

You will automatically start at the rate chosen by your community, but you have the option to change your rate at any time. Regardless of the rate you choose, you will soon enjoy the shared benefits of Clean Power Alliance including stable, competitive rates, cleaner energy, and local control.

What changes and what stays the same?

Stays the same
SCE delivery & grid reliability
SCE billing
SCE account services
SCE rebates & incentives
Call SCE to start or stop service
Receive one bill each month

New
Choice of energy providers
Competitive pricing
Higher renewable content
Lower greenhouse gas emissions
Local management & control
Shape future incentives & programs

Have questions?
Visit www.cleanpoweralliance.org
Contact us at customerservice@cleanpoweralliance.org
or 888-585-3788