AGENDA
SAN ELIJO JOINT POWERS AUTHORITY
TUESDAY, January 19, 2021 AT 8:30 AM

The next regular meeting of the San Elijo Joint Powers Authority (SEJPA) will be on Tuesday, January 19, 2021 at 8:30 a.m., PST.

Pursuant to the State of California Executive Order N-29-20 and the amended County Health Orders, members of the public will only be allowed to participate in meetings telephonically.

This regular meeting of the San Elijo Joint Powers Authority can be accessed using the phone number listed below:

Dial-In Phone Number: 669-900-9128 **Meeting ID: 975-8358-6058**

Public Comments (including oral communication and agenda item related topics must be submitted via email to hackneyv@sejpa.org not later than 7:30 a.m. the day of the meeting, January 19, 2021. These comments will be read into the record during the oral communications. Please include your name, address, group affiliation, subject, and question or comment in your email.

---

1. CALL TO ORDER

2. ROLL CALL

3. PLEDGE OF ALLEGIANCE

4. ORAL COMMUNICATIONS (NON-ACTION ITEM)

5. AWARDS AND RECOGNITION
   Aaron Simonson, Lead Operator, 15 Years of Service

6. * **CONSENT CALENDAR**

7. * APPROVAL OF MINUTES FOR DECEMBER 15, 2020 MEETING

8. * APPROVAL FOR PAYMENT OF WARRANTS AND MONTHLY INVESTMENT REPORTS

9. * WASTEWATER TREATMENT REPORT

10. * RECYCLED WATER REPORT

11. * ITEMS REMOVED FROM CONSENT CALENDAR

    Items on the Consent Calendar are routine matters and there will be no discussion unless an item is removed from the Consent Calendar. Items removed by a "Request to Speak" form from the public will be handled immediately following adoption of the Consent Calendar. Items removed by a Board Member will be handled as directed by the Board.

REGULAR AGENDA

12. 2021 ELECTION OF OFFICERS AND BOARD MEETING SCHEDULE

    1. Appoint Chairperson and Vice Chairperson for the 2021 SEJPA Board of Directors;

    2. Select regular meeting place and time for 2021; and

    3. Discuss and take action as appropriate.

    Staff Reference: General Manager

13. APPROVE AS-NEEDED PROFESSIONAL ENGINEERING SERVICES AGREEMENTS

    1. Authorize the General Manager to enter into Professional Engineering Services Agreements with CDM Smith, Carollo Engineers, and Trussell Technologies each for an not-to-exceed amount of $75,000 and

    2. Discuss and take action as appropriate.

    Staff Reference: General Manager

14. GENERAL MANAGER'S REPORT

    Informational report by the General Manager on items not requiring Board action.

15. GENERAL COUNSEL'S REPORT

    Informational report by the General Counsel on items not requiring Board action.

16. BOARD MEMBER COMMENTS

    This item is placed on the agenda to allow individual Board Members to briefly convey information to the Board or public, or to request staff to place a matter on a future agenda and/or report back on any matter. There is no discussion or action taken on comments by Board Members.

17. CLOSED SESSION

    The Board will adjourn to Closed Session to discuss item(s) identified below. Closed Session is not open to the public; however, an opportunity will be provided at this time if members of the public would like to comment on any item listed below. (Three-minute limit.) A closed session may be held at any time during this meeting of the San Elijo Joint Powers Authority for the purposes of discussing potential or pending litigation or other appropriate matters pursuant to the "Ralph M. Brown Act".

18. ADJOURNMENT

The next regularly scheduled San Elijo Joint Powers Authority Board Meeting will be Tuesday, February 16, 2021 at 8:30 a.m.

NOTICE:

The San Elijo Joint Powers Authority's open and public meetings comply with the protections and prohibitions contained in Section 202 of the Americans With Disabilities Act of 1990 (42 U.S.C Section 12132), and the federal rules and regulations adopted in implementation thereof. Any person with a disability who requires a modification or accommodation, including auxiliary aids or services, in order to participate in a public meeting of the SEJPA Board of Directors may request such modification or accommodation from Michael T. Thornton, General Manager, (760) 753-6203 ext. 72.

The agenda package and materials related to an agenda item submitted after the packet's distribution to the Board is available for public review in the lobby of the SEJPA Administrative Office during normal business hours. Agendas and minutes are available at www.sejpa.org. The SEJPA Board meetings are held on the third Tuesday of each month, with no scheduled meetings in August.

AFFIDAVIT OF POSTING

I, Michael T. Thornton, Secretary of the San Elijo Joint Powers Authority, hereby certify that I posted, or have caused to be posted, a copy of the foregoing agenda in the following locations:

San Elijo Water Campus, 2695 Manchester Avenue, Cardiff, California
City of Encinitas, 505 South Vulcan Avenue, Encinitas, California
City of Solana Beach, 635 South Highway 101, Solana Beach, California

The notice was posted at least 72 hours prior to the meeting, in accordance with Government Code Section 54954.2(a).

Date: January 14, 2021

Michael T. Thornton, P.E.
Secretary / General Manager

SAN ELIJO JOINT POWERS AUTHORITY
MINUTES OF THE BOARD MEETING
HELD ON DECEMBER 15, 2020
VIA VIDEO CONFERENCE

Vacant, Chair | Kristi Becker, Vice Chair

A meeting of the Board of Directors of San Elijo Joint Powers Authority (SEJPA) was held Tuesday, December 15, 2020, at 8:30 a.m., via a public web conference.

1. CALL TO ORDER

Vice Chair Becker called the meeting to order at 8:35 a.m.

2. ROLL CALL

Directors Present:	Kristi Becker Catherine Blakespear David Zito
Directors Absent:	Kelly Hinze
Others Present:	
General Manager	Michael Thornton
Director of Operations	Chris Trees
Director of Finance and Administration	Amy Chang
Administrative Coordinator	Vanessa Hackney
Senior Project Manager	Mike Konicke
SEJPA Counsel:	
Procopio, Cory, Hargreaves & Savitch	Adriana Ochoa
City of Encinitas:	
Assistant City Manager	Mark Delin
Director of Public Works	Carl Quiram
Assistant Director/Assistant General Manager	Isam Hireish
City of Solana Beach:	
City Manager	Greg Wade
Director of Engineering/Public Works	Mohammad “Mo” Sammak
City of Del Mar:	
Public Works Director	Joe Bride

3. PLEDGE OF ALLEGIANCE

General Manager Thornton led the Pledge of Allegiance.

4. ORAL COMMUNICATIONS

None.

5. AWARDS AND RECOGNITION

None.

6. CONSENT CALENDAR

Moved by Vice Chair Becker and seconded by Alternate Board Member Wade to approve the Consent Calendar.

Agenda Item No. 7	Approval of Minutes for the November 17, 2020 Meeting
Agenda Item No. 8	Approval for Payment of Warrants and Monthly Investment Report
Agenda Item No. 9	Wastewater Treatment Report
Agenda Item No. 10	Recycled Water Report

Motion carried with the following vote of approval:

AYES:	Becker, Blakespear, Zito
NOES	None
ABSENT:	Hinze
ABSTAIN:	None

12. 2021 ELECTION OF OFFICERS AND BOARD MEETING SCHEDULE

Item postponed to January Board Meeting.

13. APPROVAL OF SOLAR PHOTOVOLTAIC POWER PURCHASE AGREEMENT AND CONSTRUCTION SUPPORT SERVICES AGREEMENT

Senior Project Manager, Michael Konicke, stated that the San Elijo Joint Powers Authority (SEJPA) is considering the construction of a solar photovoltaic system to stabilize future energy costs, increase the use of renewable energy, and to improve climate change resiliency at the San Elijo Water Campus.

The solar photovoltaic project that staff is recommending will produce approximately 610 kilowatts of solar power, or approximately 25% of the average daily demand of the Campus. The project includes a combination of rooftop, carport, and ground-mounted solar arrays. To fund the project, staff recommends a third-party construction and financing project delivery method known as a Power Purchase Agreement.

Staff was able to reach initial agreement with REC Solar to provide a Power Purchase Agreement for the project and the parties have negotiated a near-final draft of the

contract. In order to ensure the solar photovoltaic system is constructed according to our agreement with REC Solar and coordinated with the overall Water Campus Improvements project, staff recommends a professional services agreement with Sage Energy Consulting, Inc. to provide design review, construction support, and system commissioning.

The project construction cost, valued at approximately $2.0 million, will be borne by REC Solar and reimbursed through tax incentives and SEJPA energy purchases over the term of the Power Purchase Agreement. The proposed cost for Sage design and construction support services is $53,600, or approximately 3% of construction costs, and funds are currently available in the SEJPA supplies and services budget.

Moved by Board Member Blakespear and seconded by Board Member Zito to:

1. Approve Resolution 2021-02 of the Board of Directors of the San Elijo Joint Powers Authority authorizing execution of a solar Power Purchase Agreement with REC Solar Commercial Corporation pursuant to Government Code § 4217.12;

2. Authorize the General Manager to execute a solar Power Purchase Agreement with REC Solar Commercial Corporation in a form substantially similar to the draft attached to Resolution 2021-02, subject to final negotiations by the General Manager and final approval of terms by General Counsel;

3. Authorize the General Manager to execute a professional services agreement with Sage Energy Consulting, Inc. for design and construction support for $53,600; and

4. Discuss and take action as appropriate

Motion carried with the following vote of approval:

AYES: Becker, Blakespear, Zito
NOES: None
ABSENT: Hinze
ABSTAIN: None

14. ACCEPT SOLIDS TREATMENT DEFINITION REPORT AND AWARD OF ENGINEERING DESIGN SERVICES FOR PRELIMINARY DESIGN – SOLIDS DEWATERING SYSTEM

General Manager Thornton stated, Black & Veatch completed the project definition report that provides long-term planning for the replacement and upgrading of the solids treatment facilities. The report developed an analysis of the solids treatment improvement options including estimated cost to construct and operate. The budgetary capital cost range for the six core areas of solids treatment is $9.6 million to $14.2 million.

Staff has reviewed the recommendations to identify options to prioritize capital expenditures as well as implemented process optimization improvements that have eliminated or substantially delayed the need for Primary Sludge (PS) Thickening, offsetting an estimated $1.1 million to $1.3 million in capital cost.

Black & Veatch has provided an engineering scope and fee proposal for the preliminary design. The negotiated fee for completing the preliminary design for the dewatering facility is $169,369. The project will be funded by the Wastewater Capital Program which has a fund balance of approximately $7.01 million.

Moved by Board Member Zito and seconded by Board Member Blakespear to:

1. Accept and file the Solids Treatment definition report;

2. Authorize the General Manager to execute an Engineering Agreement with Black & Veatch for Preliminary Design of the Sludge Dewatering System for an amount not to exceed $169,369; and

3. Discuss and take action as appropriate.

Motion carried with the following vote of approval:

AYES: Becker, Blakespear, Zito
NOES: None
ABSENT: Hinze
ABSTAIN: None

15. 2020 YEAR IN REVIEW – RECOGNIZING AGENCY ACHIEVEMENTS AND SUCCESSES

General Manager Thornton provided a brief PowerPoint presentation highlighting notable achievements and successes by the agency for calendar year 2020.

No action required. This memorandum was submitted for information only.

16. GENERAL MANAGER'S REPORT

General Manager Thornton reported that he had a meeting with Vice Chair Becker to review and prepare for the December Board meeting. General Manager Thornton also reported that he presented to the Encinitas Environmental Commission last week highlighting local sustainability.

17. GENERAL COUNSEL'S REPORT

None.

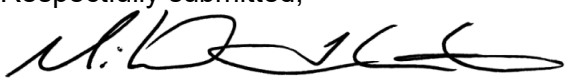
18. BOARD MEMBER COMMENTS

None.

19. ADJOURNMENT

The meeting adjourned at 9:50 a.m. The next Board of Directors meeting is scheduled to be held on Tuesday, January 19, 2021 at 8:30 a.m.

Respectfully submitted,



Michael T. Thornton, P.E.
General Manager

SAN ELIJO JOINT POWERS AUTHORITY
PAYMENT OF WARRANTS
21-01
For the Month of December 2020

Warrant #	Vendor Name	G/L Account	Warrant Description	Amount
39102	Alliant Insurance Services,Inc	Insurance - Auto	Additional premium for new vehicle	$ 193.00
39103	AT&T	Utilities - Telephone	Phone service - 10/13/20 - 11/12/20	452.67
39104	AT&T	Utilities - Telephone	Alarm service	400.28
39105	Boot World, Inc.	Uniforms - Boots	Employee reimbursement - Safety boots (1)	198.76
39106	Brenntag Pacific, Inc	Supplies - Chem - Odor	Sodium hydroxide	1,313.09
39107	California Water Technologies	Supplies - Chem - Ferric Chlo	Ferric chloride	6,228.66
39108	City National Bank	AWT Note	Loan agreement #11-020	74,076.57
39109	Compositech Filters	Repair Parts Expense	BFP #2 - Roller bearing assembly	3,816.13
39110	County of San Diego	Fees - Permits	Recycled water project	765.00
39111	D&H Water Systems	Supplies - Chemicals	Acetate buffer	572.55
39112	Denali Water Solutions LLC	Services - Biosolids Hauling	Oct	16,956.93
39113	DMV	Services - Other	Safety records - 10/01/20 - 10/31/20	2.00
39114	E & M Electric & Machinery, In	Licenses	Wonderware license renewal for SCADA - Nov 2020 to Oct 2022	29,990.00
39115	EDCO Waste & Recycling Service	Utilities - Trash	Nov	265.16
39116	City of Encinitas	Service - IT Support	Admin network - Dec	7,725.00
39117	City of Encinitas	Licenses	Zoom	39.98
39118	City of Encinitas	Licenses	Duo	30.00
39119	Eurofins Calscience, Inc.	Services - Laboratory	Testing water samples	895.50
39120	Evantec Scientific	Supplies - Laboratory	Various supplies	397.56
39121	Flo-Systems, Inc.	Capital Outlay	Replacement pump for digester	23,826.88
39122	FRS Environmental	Services - Maintenance	Parts washer service - 09/01/20 - 11/30/20	271.55
39123	Grainger, Inc.	Repair Parts Expense	Flame amplifier ultraviolet, gas burner ignition transformer, UV sensor for Boiler	580.33
39124	GLS US	Postage/Shipping	Shipping fee for water samples	70.20
39125	Hach Company	Services - Maintenance	Instruments service	122.50
39126	Hardy Diagnostics	Supplies - Laboratory	Various supplies	1,350.74
39127	Housing &Community Development	Licenses	Licenses for Administration Building	84.00
39128	Helix Environmental Planning	Services - Professional	WCI project	486.26
39129	Liquid Environmental Solution	Services - Grease & Scum	Grease and scum pumping	4,090.24
39130	McMaster-Carr Supply Co.	Repair Parts Expense	Compressor and brackets	199.95
39131	The Nyhart Company	Services - Accounting	Annual GASB 68 pension actuarial report	1,500.00
39132	Olin Corp - Chlor Alkali	Supplies - Chem - Sodium Hypo	Sodium hypochlorite	3,680.07
39133	Olivenhain Municipal Water Dis	Services - Lobbying	Lobbying cost share	7,446.93
39134	Pacific Pipeline Supply	Repair Parts Expense	Bolt and nut set, flange, spool glass lined	2,549.96
39135	Peerless Materials Co., LLC	Supplies - Shop & Field	Shop towels	404.54
39136	ProBuild Company, LLC	Supplies - Laboratory	Various supplies	252.04
39137	Procopio Cory Hargreaves	Services - Legal	Legal service fees - Oct	6,542.50
39138	The Pun Group LLP	Services - Accounting	Annual audit payment	5,000.00
39139	Quality Assurance Solutions	Training	Continuing education for laboratory analyst certification	400.00
39140	Roesling Nakamura Terada Archi	Services - Professional	WCI project	6,525.88
39141	Rohan & Sons, Inc	Services - Maintenance	Install OEM evaporator coil	1,601.32
39142	Santa Fe Irrigation District	Utilities - Water	Water and Recycled water	2,771.68
39143	Santa Fe Irrigation District	SFID Distribution Pipeline	Pipeline purchase payment - Oct	1,480.37
39144	Sloan Electric Company	Repair Parts Expense	Baldor drip cover, fan cover, and end bell	342.65
39145	Southwest Membrane Operation	Dues & Memberships	Membership - A. Simonson, C. Trees	435.00
39146	Thatcher Company of California	Supplies - Chemicals	Citric acid	2,039.92
39147	Technology Integration Group	Services - Maintenance	Copier	69.67
39148	Trussell Technologies, Inc	Services - Engineering	Operations plan update and training	1,721.00
39149	Unifirst Corporation	Services - Uniforms	Uniform service	103.22
39150	UPS	Postage/Shipping	Shipping fee for parts	54.32
39151	USA Bluebook	Supplies - Laboratory	Various supplies	2,211.27
39152	Vantagepoint Transfer Agents	EE Deduction Benefits	ICMA - 457	6,529.16
39153	Vantagepoint Transfer Agents	ICMA Retirement	ICMA - 401a	4,059.81
39154	Verizon Wireless	Utilities - Telephone	10/11/20 - 11/10/20	401.67
39155	Volt Management Corp	Services - Temp	Internship program - 10/16/20 thru 11/20/20	6,470.72
39156	VWR International, Inc.	Supplies - Laboratory	Various supplies	1,206.40
39157	WageWorks	Payroll Processing Fees	Admin and compliance fee - Oct	128.75
39158	Water Systems Consulting, Inc.	Services - Professional	Strategic communications	4,785.00
39159	Brax Process and Pump Equip.	Services - Maintenance	Pump #3 motor repair - Cardiff PS	4,259.00
39160	BrightView Landscapes	Services - Landscape	Dec	2,782.00
39161	Burns & McDonnell Engineering	Services - Professional	USBR FY21 Water Reclamation and Research Project	6,000.00
39162	Carollo Engineers	Services - Engineering	ARC Flash and Protection Study	10,111.90
39163	Corodata	Rent	Record storage - Nov	99.08
39164	County of San Diego	Fees - Permits	APCD permit renewal	446.00
39165	Encinitas Ranch Community Asso	Capital Outlay	Encinitas Ranch Recycled Water project	2,400.00
39166	EnvirGreen Electronic Rec	Fees - Disposal	E-waste pick-up	108.00
39167	Eurofins Calscience, Inc.	Services - Laboratory	Testing water samples	6,082.50
39168	GC Pivotal LLC	Utilities - Telephone	T-1 service - Jan	355.24
39169	Hardy Diagnostics	Supplies - Laboratory	Various supplies	396.27
39170	Infrastructure Engineering	Services - Engineering	Recycled water storage & conveyance system evaluation	8,207.50
39171	Liquid Environmental Solution	Services - Grit & Screenings, Grease & Scum	Grease and scum pumping, roll-off box delivery	2,777.44
39172	Midas Shop	Vehicle Maintenance	New tires and starter for F250 Super Duty	1,607.61
39173	The Nyhart Company	Services - Accounting	Annual GASB 75 OPEB actuarial report	1,800.00
39174	Olivenhain Municipal Water Dis	Rent	Pipeline rental payment - Nov	9,090.00
39175	PCL Construction Services PCL	Services - Contractors	WCI project	976,612.00
39176	Preferred Benefit Insurance	Dental/Vision	Vision - Dec	290.80
39177	ProBuild Company, LLC	Supplies - Shop & Field	Tools and mixing tub	79.59
39178	Procopio Cory Hargreaves	Services - Legal	Legal service fees - Nov	13,167.00
39179	Rockwell Solutions	Repair Parts Expense	Backplate with insert for Coast pump station	2,209.23
39180	Rockwell Solutions	Repair Parts Expense	Mechanical seal for Coast pump station chopper pump	1,786.94
39181	RSF Security Systems	Prepaid - Other	RSF Security - 12/01/20 - 02/28/21	1,455.00
39182	Santa Fe Irrigation District	SFID Distribution Pipeline	Pipeline purchase payment - Nov	970.04
39183	San Dieguito Water District	Utilities - Water	Water and Recycled water	110.89
39184	San Dieguito Water District	Utilities - Water	Water and Recycled water	1,333.03
39185	State Water Resources Control	Fees - Permits	Annual permit fees	28,909.00
39186	Terminix Processing Center	Services - Maintenance	Pest control service - Nov	435.00
39187	Traffic Safety Store	Supplies - Safety	Mesh safety vests	287.40
39188	Unifirst Corporation	Services - Uniforms	Uniform service	103.22
39189	US Bank PARS Acct.#6746050100	Accrued Liabilities	Additional pension contribution to PARS trust account	263,019.51
39190	Underground Service Alert/SC	Services - Alarm	Safe excavation board and Dig alert - Nov	134.19
39191	Vantagepoint Transfer Agents	EE Deduction Benefits	ICMA - 457	6,603.41
39192	Vantagepoint Transfer Agents	ICMA Retirement	ICMA - 401a	4,036.51
39193	Varec Biogas	Services - Maintenance	Biogas flare equipment maintenance for digester area	11,322.00
39194	Volt Management Corp	Services - Temp	Internship program - 09/27/20 to 11/29/20	3,603.26

SAN ELIJO JOINT POWERS AUTHORITY
PAYMENT OF WARRANTS
21-01
For the Month of December 2020

Warrant #	Vendor Name	G/L Account	Warrant Description	Amount
39195	VWR International, Inc.	Shop Tools and Equip.	BOD sensor cap replacement	174.94
39196	WorkPartners Occupational	Services - Medical	Covid-19 testing - Nov	580.00
On-line 470	P.E.R.S.	Medical Insurance - Pers	Health - Dec	20,528.30
On-line 471	Public Employees- Retirement	Retirement Plan - PERS	Retirement - 11/14/20 - 11/27/20	15,730.66
On-line 472	Fuelman	Fuel	Nov	371.02
On-line 473	Public Employees- Retirement	Retirement Plan - PERS	Retirement - 11/28/20 - 12/11/20	15,965.72
On-line 474	ReadyRefresh	Supplies - Laboratory	Various supplies	513.70
On-line 475	San Diego Gas & Electric	Utilities - Gas & Electric	Gas and electric - 10/06/20 - 11/05/20	61,319.11
On-line 476	Sun Life Financial	Life Insurance/Disability	Life and disability insurance - Dec, Jan	3,679.26
	San Elijo Payroll Account	Payroll	Payroll - 12/04/2020	81,532.93
	San Elijo Payroll Account	Payroll	Payroll - 12/18/2020	82,157.53
				1,901,659.07

SAN ELIJO JOINT POWERS AUTHORITY

PAYMENT OF WARRANTS SUMMARY

For the Month of December 2020
As of December 30, 2020

PAYMENT OF WARRANTS		$ 1,901,659.07
Reference Number	21-01	

I hereby certify that the demands listed and covered by warrants are correct and just to the best of my knowledge, and that the money is available in the proper funds to pay these demands. The cash flows of the SEJPA, including the Member Agency commitment in their operating budgets to support the operations of the SEJPA, are expected to be adequate to meet the SEJPA's obligations over the next six months. I also certify that the SEJPA's investment portfolio complies with the SEJPA's investment policy.

Amy Chang
Director of Finance & Administration

STATEMENT OF FUNDS AVAILABLE FOR PAYMENT OF WARRANTS
AND INVESTMENT INFORMATION
As of December 30, 2020

FUNDS ON DEPOSIT WITH		AMOUNT
LOCAL AGENCY INVESTMENT FUND		
(NOVEMBER 2020 YIELD 0.576%)		
RESTRICTED SRF RESERVE	$	630,000.00
UNRESTRICTED DEPOSITS		10,698,792.14
CALIFORNIA BANK AND TRUST		
(DECEMBER 2020 YIELD 0.01%)		
REGULAR CHECKING		2,917,554.79
PAYROLL CHECKING		5,000.00
UNION BANK - TRUSTEE (BOND FUNDS)		
BLACKROCK		485.07
(NOVEMBER 2020 YIELD 0.01%)		
LAIF		5,762,228.89
(NOVEMBER 2020 YIELD 0.576%)		
PARS - TRUSTEE (POST-EMPLOYMENT BENEFITS TRUST)		58,227.58
(NOVEMBER 2020 YIELD -7.17%)		
TOTAL RESOURCES	$	20,072,288.47

*

AGENDA ITEM NO. 9

SAN ELIJO JOINT POWERS AUTHORITY
MEMORANDUM

January 19, 2021

TO: Board of Directors
San Elijo Joint Powers Authority

FROM: General Manager

SUBJECT: WASTEWATER TREATMENT REPORT

RECOMMENDATION

No action required. This memorandum is submitted for information only.

DISCUSSION

Monthly Treatment Plant Performance and Evaluation

Wastewater treatment for the San Elijo Joint Powers Authority (SEJPA) met all National Pollutant Discharge Elimination System (NPDES) ocean effluent limitation requirements for the month of November 2020. The primary indicators of treatment performance include the removal of Carbonaceous Biochemical Oxygen Demand (CBOD) and Total Suspended Solids (TSS). The SEJPA is required to remove a minimum of 85 percent of the CBOD and TSS from the wastewater. Treatment levels for **CBOD** and **TSS** were **98.4** and **98.5** percent removal, respectively, during the month of November.

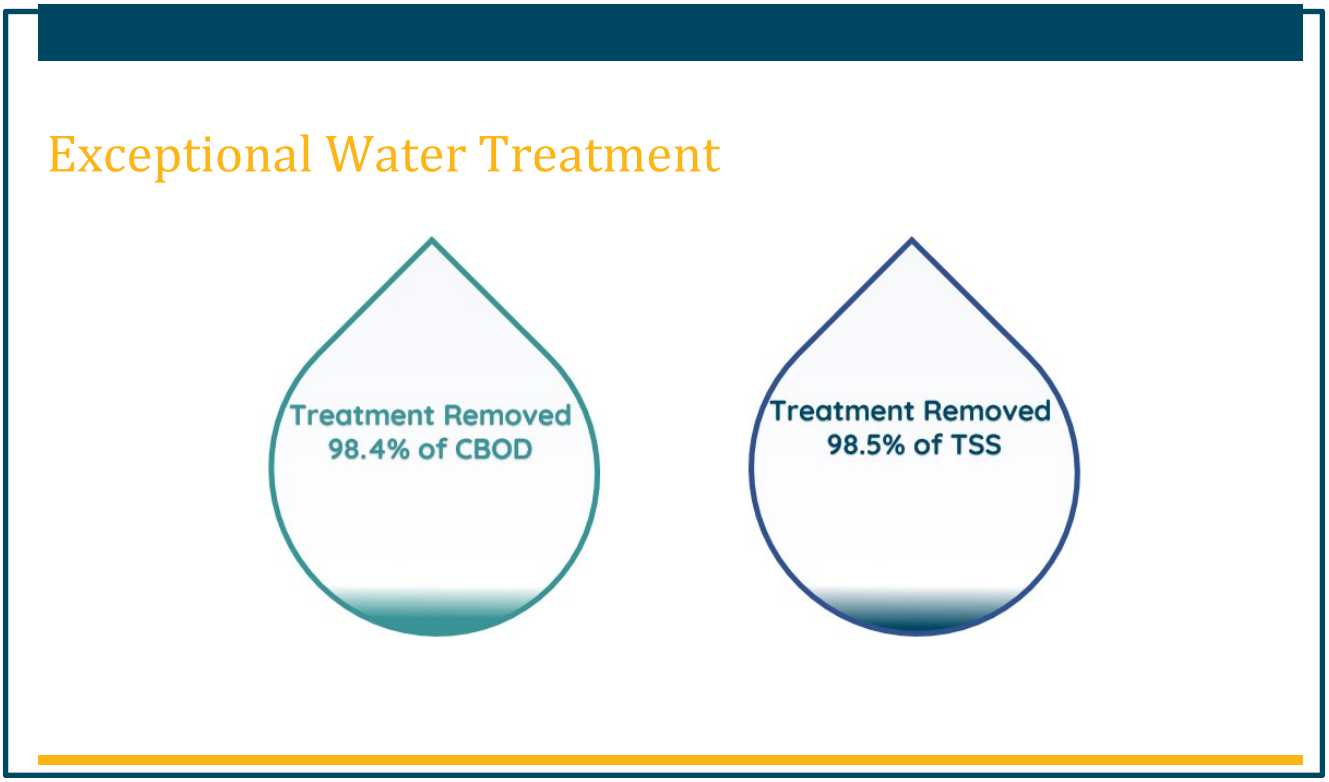
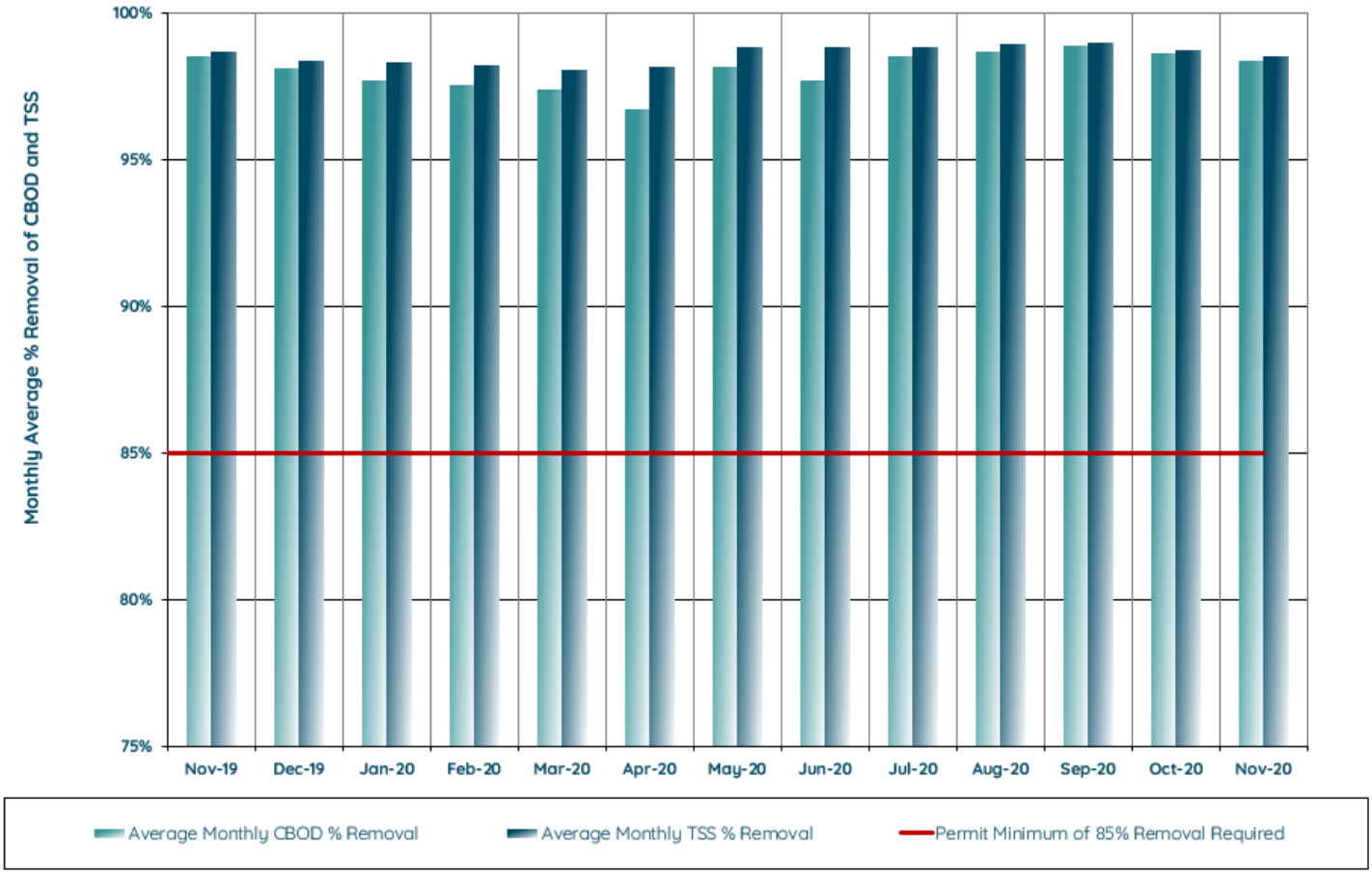


Figure 1 (below) shows historic treatment performance trends for the removal of CBOD and TSS over the last 13 months compared to the permit minimum of 85%.

Figure 1: Wastewater Treatment Performance of the SEJPA % Removal of Carbonaceous Biochemical Oxygen Demand (CBOD) and Total Suspended Solids (TSS)



Figures 2 and 3 (below) show historic influent vs effluent CBOD and TSS concentration fluctuations in the strength of the wastewater being received and discharged by the SEJPA. Rain events often result in rainwater entering into the sewer system which can dilute both CBOD and TSS.

FIGURE 2: TREATED EFFLUENT FLOWS REMOVAL OF CBOD

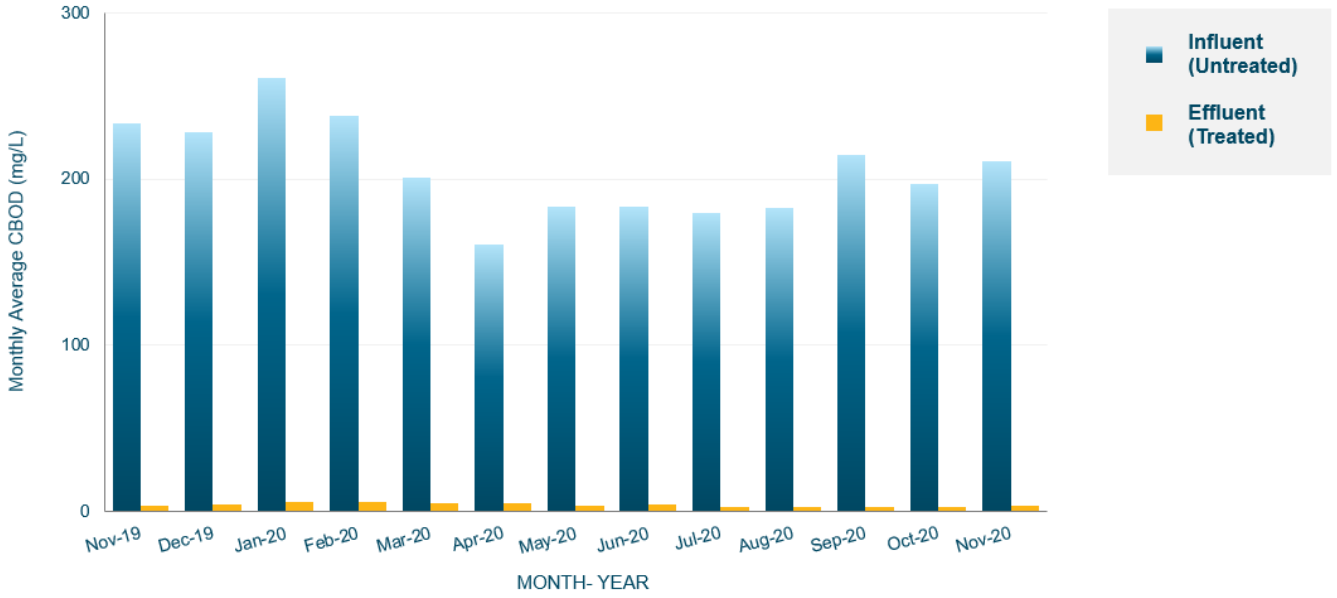
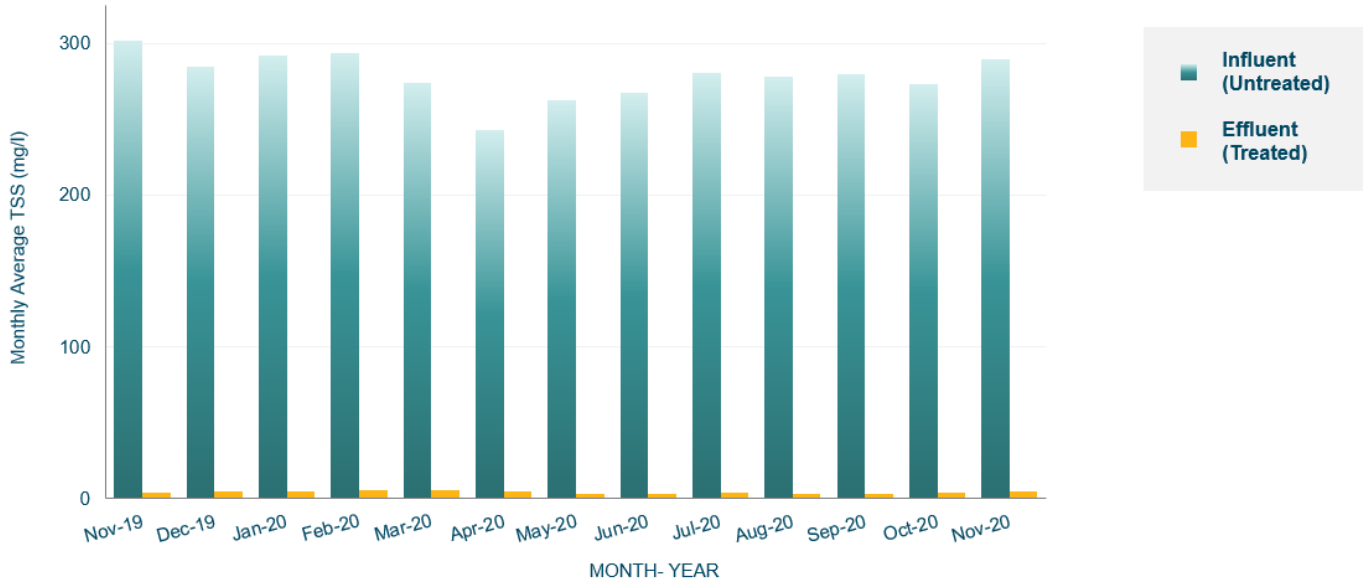


FIGURE 3: TREATED EFFLUENT FLOWS REMOVAL OF TSS



Member Agency Flows

Table 1 (below) presents the influent and effluent flows for the month of November. Average daily influent flows were recorded for each Member Agency. Total effluent flow was calculated for the San Elijo Water Campus.

TABLE 1 – INFLUENT AND EFFLUENT FLOWS IN NOVEMBER

NOVEMBER			
	Influent (mgd)	Recycled Water (mgd)	Effluent (mgd)*
Cardiff Sanitary Division	1.200	0.514	0.686
City of Solana Beach	0.927	0.397	0.530
Rancho Santa Fe SID	0.142	0.060	0.082
City of Del Mar	0.341	0.146	0.195
Total San Elijo Water Campus Flow	2.610	1.117	1.493

* Effluent is calculated by subtracting the recycled water production from the influent wastewater.

Table 2 (below) presents the historical average and unit influent rates per month for each of the Member Agencies during the past 3 years. It also presents the number of connected Equivalent Dwelling Units (EDUs) for each of the Member Agencies during this same time period.

	AVERAGE DAILY INFLUENT FLOW RATE (MGD)					CONNECTED EDUs					AVERAGE UNIT INFLUENT FLOW RATE (GAL/EDU/DAY)				
MONTH	CSD	RSF CSD	SB	DM	TOTAL PLANT	CSD EDUS	RSF CSD EDUS	SB EDUS	DM	TOTAL EDUS	CSD	RSF	SB	DM	TOTAL PLANT
Aug-17	1.262	0.139	1.051	0.000	2.452	8,423	553	8,061	1,716	18,753	150	251	130	0	144
Sep-17	1.264	0.130	1.006	0.000	2.400	8,427	555	8,061	1,716	18,759	150	234	125	0	141
Oct-17	1.242	0.123	0.977	0.000	2.342	8,431	555	8,061	1,716	18,763	147	222	121	0	137
Nov-17	1.257	0.131	0.983	0.000	2.371	8,431	554	8,061	1,716	18,762	149	237	122	0	139
Dec-17	1.248	0.125	1.014	0.000	2.387	8,431	554	8,061	1,716	18,762	148	226	126	0	140
Jan-18	1.276	0.125	1.015	0.000	2.416	8,435	555	8,061	1,716	18,767	151	225	126	0	142
Feb-18	1.249	0.118	0.968	0.000	2.335	8,441	555	8,061	1,716	18,773	148	213	120	0	137
Mar-18	1.265	0.122	0.922	0.039	2.348	8,451	555	8,061	1,716	18,782	150	220	114	149	125
Apr-18	1.184	0.115	0.901	0.337	2.537	8,451	559	8,061	1,716	18,786	140	206	112	129	135
May-18	1.173	0.119	0.890	0.376	2.558	8,461	562	8,061	1,716	18,799	139	212	110	144	136
Jun-18	1.188	0.124	0.888	0.549	2.749	8,466	562	8,061	1,716	18,804	140	221	110	210	146
Jul-18	1.193	0.118	0.933	0.537	2.781	8,478	562	8,083	2,611	19,733	141	210	115	206	141
Aug-18	1.210	0.119	0.980	0.534	2.843	8,481	563	8,083	2,611	19,737	143	212	121	205	144
Sep-18	1.230	0.117	0.905	0.341	2.593	8,481	563	8,083	2,611	19,737	145	208	112	131	131
Oct-18	1.172	0.121	0.897	0.354	2.544	8,481	564	8,083	2,611	19,738	138	215	111	136	129
Nov-18	1.173	0.121	0.906	0.064	2.264	8,488	565	8,083	2,611	19,746	138	214	112	136	129
Dec-18	1.264	0.144	0.967	0.244	2.619	8,491	566	8,083	2,611	19,751	149	255	120	136	138
Jan-19	1.269	0.153	0.975	0.384	2.781	8,491	566	8,083	2,611	19,751	149	271	121	147	141
Feb-19	1.400	0.173	0.935	0.309	2.817	8,492	566	8,083	2,611	19,752	165	306	116	137	145
Mar-19	1.200	0.149	0.908	0.340	2.597	8,493	568	8,083	2,611	19,755	141	263	112	132	132
Apr-19	1.119	0.138	0.887	0.334	2.478	8,494	568	8,083	2,611	19,756	132	243	110	128	125
May-19	1.125	0.133	0.880	0.361	2.499	8,494	568	8,083	2,611	19,756	132	234	109	138	126
Jun-19	1.162	0.126	0.903	0.507	2.698	8,504	568	8,083	2,611	19,766	137	222	112	194	136
Jul-19	1.127	0.128	0.924	0.546	2.725	8,504	568	8,083	2,611	19,766	133	226	114	209	138
Aug-19	1.148	0.126	0.938	0.567	2.779	8,505	570	8,105	2,612	19,792	135	221	116	217	140
Sep-19	1.131	0.132	0.918	0.393	2.574	8,507	570	8,105	2,612	19,794	133	232	113	150	130
Oct-19	1.120	0.124	0.914	0.378	2.536	8,507	571	8,105	2,612	19,795	132	217	113	145	128
Nov-19	1.230	0.137	0.927	0.437	2.731	8,510	571	8,105	2,612	19,798	145	240	114	172	138
Dec-19	1.347	0.173	0.946	0.483	2.949	8,516	571	8,105	2,612	19,804	158	303	117	185	149
Jan-20	1.194	0.163	0.917	0.410	2.684	8,517	571	8,105	2,612	19,805	140	286	113	157	136
Feb-20	1.176	0.146	0.919	0.352	2.593	8,517	571	8,105	2,612	19,805	138	256	113	135	131
Mar-20	1.432	0.185	0.907	0.389	2.913	8,519	572	8,105	2,612	19,808	168	324	112	149	147
Apr-20	1.720	0.231	0.912	0.377	3.240	8,522	572	8,105	2,612	19,811	202	404	113	153	164
May-20	1.293	0.158	0.853	0.304	2.608	8,523	573	8,105	2,612	19,813	152	276	105	133	132
Jun-20	1.251	0.164	0.897	0.434	2.746	8,534	576	8,105	2,612	19,826	147	285	111	179	139
Jul-20	1.231	0.157	0.937	0.548	2.873	8,535	576	8,110	2,616	19,837	144	273	116	222	145
Aug-20	1.226	0.156	0.950	0.478	2.810	8,540	577	8,110	2,616	19,843	144	271	117	194	142
Sep-20	1.225	0.151	0.956	0.362	2.694	8,540	578	8,110	2,616	19,844	143	261	118	146	136
Oct-20	1.197	0.142	0.940	0.316	2.595	8,543	579	8,110	2,616	19,848	140	245	116	128	131
Nov-20	1.200	0.142	0.927	0.341	2.610	8,543	579	8,110	2,616	19,848	140	245	114	138	131

CSD: Cardiff Sanitary Division

RSF CSD: Ranch Santa Fe Community Service District

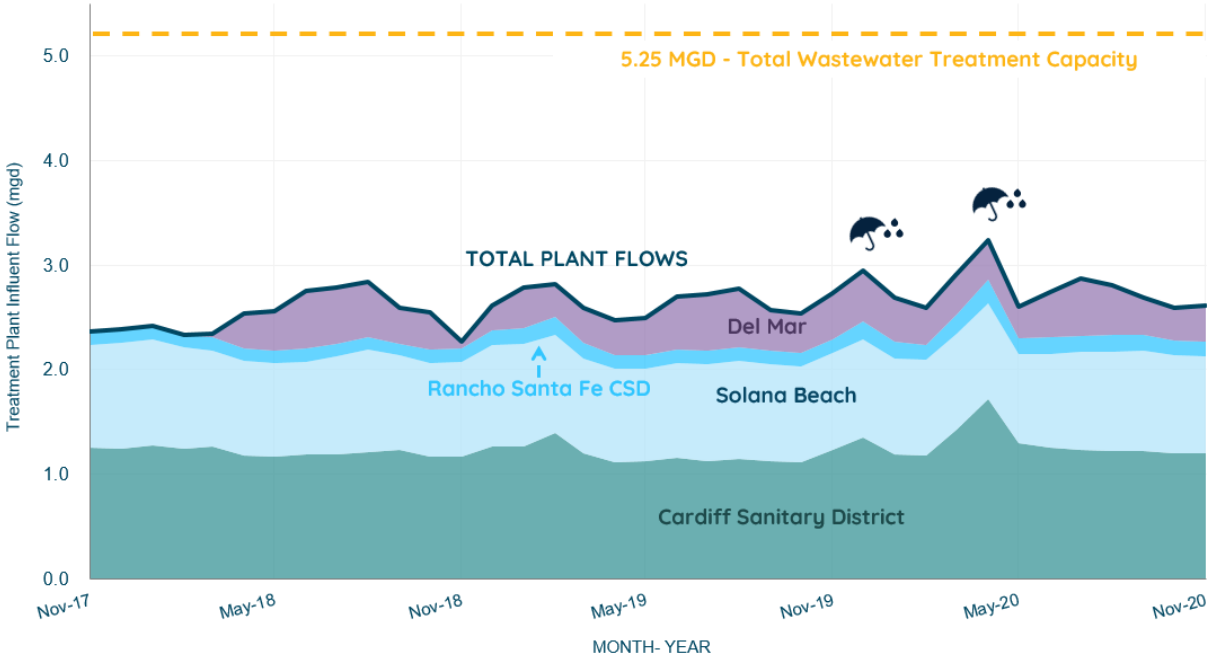
SB: Solana Beach

DM: City of Del Mar

EDU: Equivalent Dwelling Unit

Figure 4 (below) presents the 3-year historical average daily flows per month for each Member Agency. This is to provide a historical overview of the average flow treated for each agency. Also shown in Figure 4 is the total wastewater treatment capacity of the water campus, 5.25 mgd, of which each Member Agency has the right to 2.2 mgd, Rancho Santa Fe Community Service District leases 0.25 mgd, and the City of Del Mar leases 0.60 mgd.

FIGURE 4: SEJPA AVERAGE DAILY FLOWS OVER THE PAST 5 YEARS



City of Escondido Flows

The average and peak flow rate for the month of November 2020 from the City of Escondido's Hale Avenue Resource Recovery Facility, which discharges through the San Elijo Ocean Outfall, is reported below in Table 3.

TABLE 3 – CITY OF ESCONDIDO FLOWS

	Flow (mgd)
Escondido (Average flow rate)	8.79
Escondido (Peak flow rate)	18.0

Connected Equivalent Dwelling Units

The City of Solana Beach and the City of Del Mar updated the number of connected EDUs that is reported to the SEJPA in July 2020. The City of Encinitas and Rancho Santa Fe CSD report their connected EDUs every month. The number of EDUs connected for each of the Member Agencies and lease agencies is reported in Table 4 below.

TABLE 4 – CONNECTED EDUs BY AGENCY

	Connected (EDU)
Cardiff Sanitary Division	8,543
Rancho Santa Fe SID	579
City of Solana Beach	7,773
San Diego (to Solana Beach)	337
City of Del Mar	2,616
Total EDUs to System	19,848

Respectfully submitted,

Michael T. Thornton, P.E.
General Manager

*

AGENDA ITEM NO. 10

SAN ELIJO JOINT POWERS AUTHORITY
MEMORANDUM

January 19, 2021

TO: Board of Directors
San Elijo Joint Powers Authority

FROM: General Manager

SUBJECT: RECYCLED WATER REPORT

RECOMMENDATION

No action required. This memorandum is submitted for information only.

DISCUSSION

Recycled Water Production

For the month of November 2020, recycled water demand was 100.1 acre-feet (AF), which was met using 100.1 AF of recycled water and 0.0 AF supplementation with potable water.

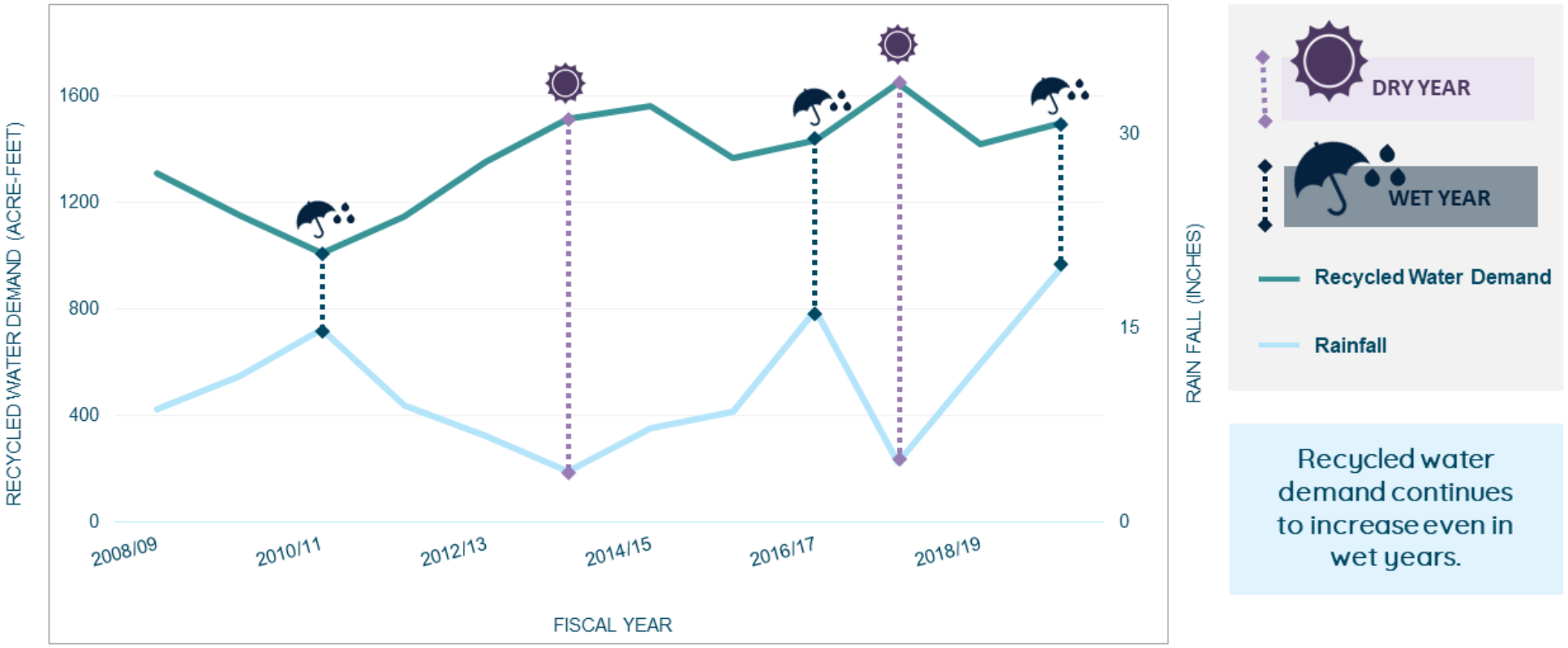
November demand was 4.0% above budget expectations of 96 AF. The total water production for FY 2020-21 is 5.9% above budget for the first five months.

Figure 1 (attached) provides a graphical view of annual recycled water demand spanning the last 10 fiscal years, with the overlay of annual rainfall. Since the recycled water program primarily serves outdoor irrigation, annual demand is reduced during wet periods and increases during times of drought. Figure 2 (attached) shows the monthly recycled water demand for each November for the last ten years to provide a year-over-year comparison. Figure 3 (attached) compares budget versus actual recycled water sales for FY 2020-21.

Respectfully submitted,

Michael T. Thornton, P.E.
General Manager

FIGURE 1: RECYCLED WATER DEMAND AND RAINFALL COMPARISON



Recycled water demand continues to increase even in wet years.

FIGURE 2: NOVEMBER RECYCLED WATER DEMAND

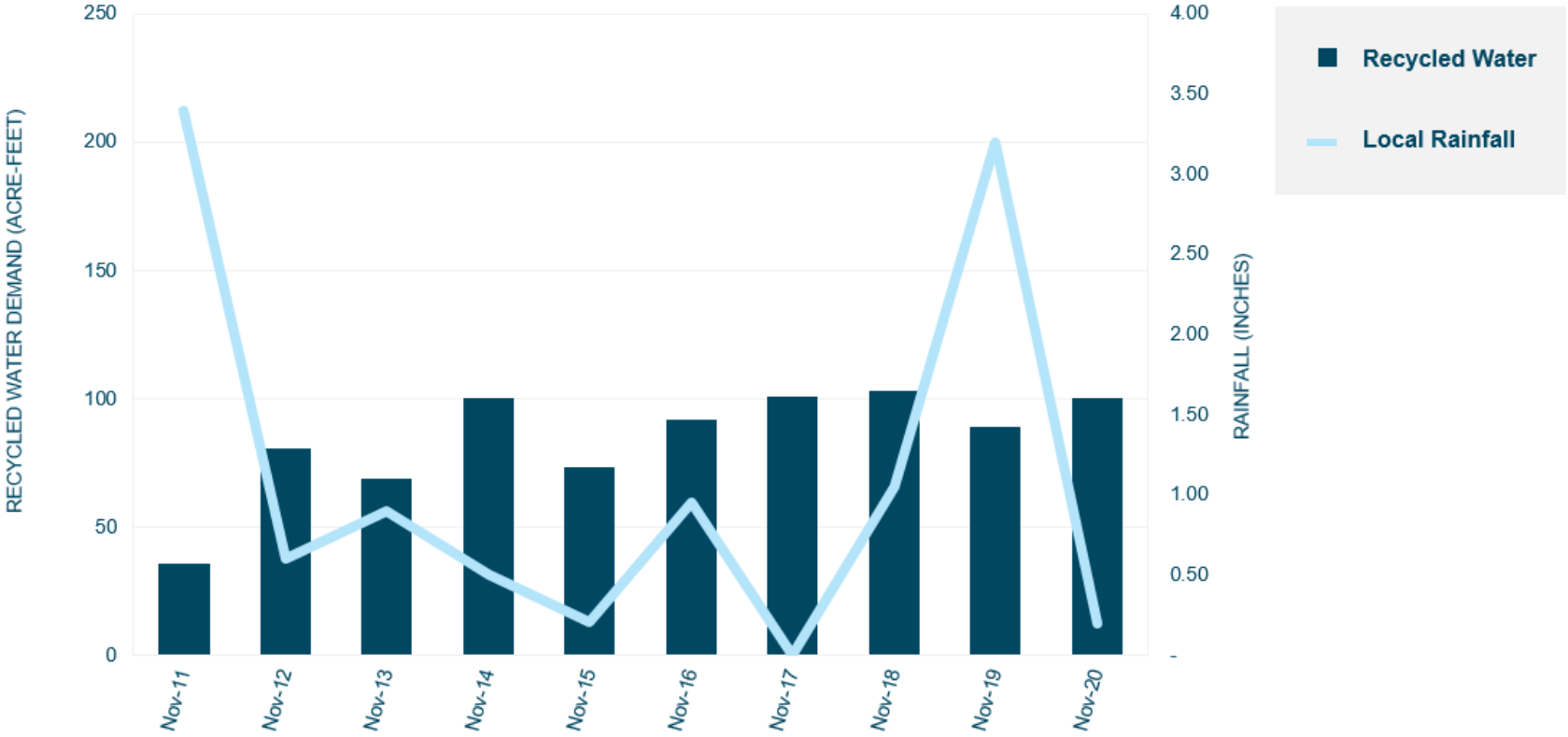
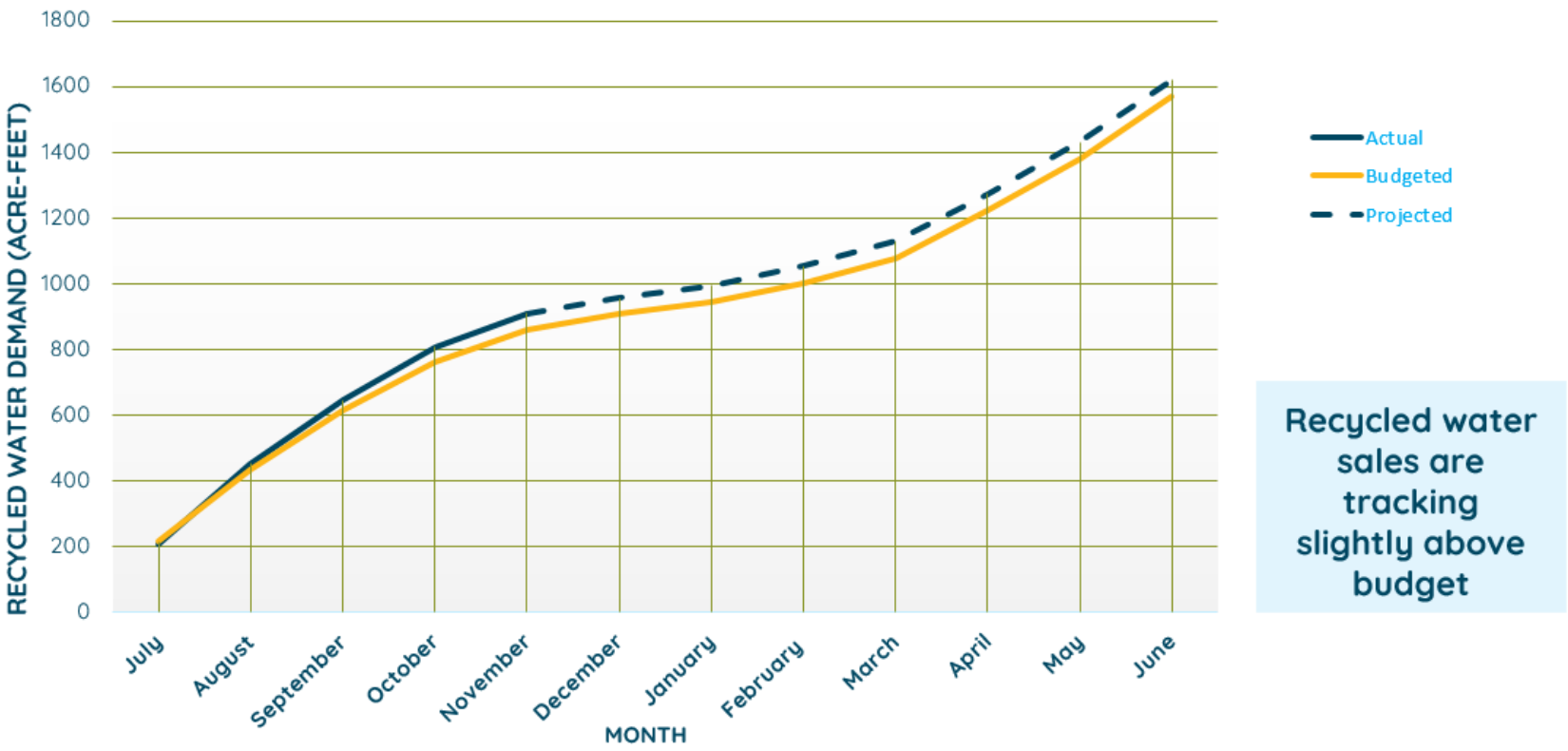


FIGURE 3: FY2020/21 CUMULATIVE DEMAND VS BUDGET



Recycled water sales are tracking slightly above budget

AGENDA ITEM NO. 12

SAN ELIJO JOINT POWERS AUTHORITY
MEMORANDUM

January 19, 2021

TO: Board of Directors
San Elijo Joint Powers Authority

FROM: General Manager

SUBJECT: 2021 ELECTION OF OFFICERS AND BOARD MEETING SCHEDULE

RECOMMENDATION

It is recommended that the Board of Directors:

1. Appoint Chairperson and Vice Chairperson for the 2021 SEJPA Board of Directors;
2. Select regular meeting place and time for 2021; and
3. Discuss and take action as appropriate.

DISCUSSION

In accordance with Article 3 of the San Elijo Joint Powers Authority (SEJPA) formation agreement, the SEJPA Board is required to appoint a chairperson and vice-chairperson and establish the time and place for its regular meeting by the second meeting of each calendar year. The appointment of chairperson and vice chairperson is by nomination and vote of the SEJPA Board. The proposed 2021 Regular Meeting Schedule of the Board of Directors is 8:30 a.m. on the third Tuesday of each month, with exceptions in July (no meeting) and December (second Tuesday), as shown in Attachment 1. Pursuant to the State of California Executive Order N-29-20 and the amended County Health Orders, Board meetings will be conducted through online video conferencing and telephonically. Upon allowance of in-person public meetings, the proposed meeting location is the San Elijo Water Campus located at 2695 Manchester Avenue, Cardiff-by-the-Sea Encinitas, CA 92007.

It is therefore recommended that the Board of Directors:

1. Appoint Chairperson and Vice Chairperson for the 2021 SEJPA Board of Directors;
2. Select regular meeting place and time for 2021; and
3. Discuss and take action as appropriate.

Respectfully submitted,

Michael T. Thornton
General Manager

Attachment 1: Proposed 2021 Board Meeting Schedule

ATTACHMENT 1

SAN ELIJO | JOINT POWERS AUTHORITY

BOARD OF DIRECTORS

San Elijo Joint Powers Authority

PROPOSED
2021 BOARD MEETING DATES

January 19
February 16
March 16
April 20
May 18
June 15
July – No Meeting
August 17
September 21
October 19
November 16
December 14

AGENDA ITEM NO. 13

SAN ELIJO JOINT POWERS AUTHORITY
MEMORANDUM

January 19, 2021

TO: Board of Directors
San Elijo Joint Powers Authority

FROM: General Manager

SUBJECT: APPROVE AS-NEEDED PROFESSIONAL ENGINEERING SERVICES AGREEMENTS

RECOMMENDATION

It is recommended that the Board of Directors:

1. Authorize the General Manager to enter into Professional Engineering Services Agreements with CDM Smith, Carollo Engineers, and Trussell Technologies each for an not-to-exceed amount of $75,000; and

2. Discuss and take action as appropriate.

BACKGROUND

The San Elijo Joint Powers Authority (SEJPA) routinely requires minor engineering services for its capital projects, to support system analyses and evaluations, and to assist repair/replacement projects. Staff is seeking authorization to engage in as-needed service agreements in order to efficiently conduct engineering services in support the agency's wastewater, ocean outfall, and recycled water operations.

DISCUSSION

SEJPA requested Statement of Qualifications (SOQ) from engineering firms with knowledge and experience in the fields of wastewater and recycled water for the provision of as-needed engineering services. Staff reviewed the submitted qualifications and recommends approving as-needed service agreements with the following firms based on qualifications, demonstrated competence, and fair and reasonable fee proposals:

- CDM Smith – Engineering Design
- Carollo Engineers – Asset Planning and Management
- Trussell Technologies – Water Quality Services

Staff proposes to retain the selected engineering firms to provide consulting services on an "on-call" basis in accordance with section 4.0 (a) of Resolution 2020-01 Establishing Purchasing Policies and Procedures for the San Elijo Joint Powers Authority. Once engaged, SEJPA will

solicit price estimates for task orders based on a defined scope of work for selected projects as they arise. The final scope and fees will be negotiated according to the fee schedule established in the SOQ; once finalized, staff will authorize a task order and issue a notice to proceed. Staff anticipates that each of the professional engineering services agreements will be comprised of individual task orders for minor projects that are generally less than $50,000.

FINANCIAL IMPACT

Funds for these services in the amount of $225,000 were included in the Fiscal Year 2020-21 Budget. The selected consultants each submitted billing schedules for engineering related services on a time and material basis. The hourly rates are often reduced from their normal rates because certain business development costs are not required for the “on-call” nature of the work involved. Cost incurred though the proposed Professional Engineering Services Agreements will be assigned to the specific program that receives the work. For accounting, tracking and timing purposes, the payment of compensation under the as needed services contracts will be considered to be expended upon execution of task orders, as opposed to upon completion of work or payment of invoices.

It is therefore, recommended that the Board of Directors:

1. Authorize the General Manager to enter into Professional Engineering Services Agreements with CDM Smith, Carollo Engineers, and Trussell Technologies each for an not-to-exceed amount of $75,000; and

2. Discuss and take action as appropriate.

Respectfully submitted,

Michael T. Thornton, P.E.
General Manager

Attachment 1: CDMsmith SOQ
Attachment 2: Carollo SOQ
Attachment 3: Trussell Technologies SOQ

Attachment 1

STATEMENT OF QUALIFICATIONS

San Elijo Joint Powers Authority

On-Call Engineering Services

San Elijo Water Campus and Remote Facilities

December 22, 2020

CDM Smith

CDM Smith
703 Palomar Airport Road, Suite 300
Carlsbad, CA 92011
tel: 760 438-7755

December 22, 2020

Michael Thornton, PE – General Manager

San Elijo Joint Powers Authority
2695 Manchester Avenue
Cardiff by the Sea, California 92007

Table of Contents

Subject: Statement of Qualifications – On-Call Engineering Services for San Elijo Water Campus and Remote Facilities

Dear Mr. Thornton:

We appreciate the opportunity to provide this statement of qualifications to support on-call engineering services to the San Elijo Joint Powers Authority's (San Elijo) ongoing operations and maintenance (O&M) and capital improvement project(s). This letter provides our understanding of San Elijo's needs, presents CDM Smith's experience in supporting public clients under similar on-call arrangements, and highlights our Southern California-based key personnel that we anticipate will be involved in task orders.

San Elijo can depend on CDM Smith's team to:

- **Provide Responsive Service**
  Led by our local Contract/Project Manager Tom Falk and experienced task and discipline leads, San Eljio can be confident that each task order will be scoped and executed in a timely and efficient manner. We provide on-call, task order-based services for 40 agencies throughout Southern California, providing a resource pool that can efficiently mobilize to support a wide variety of assignments. Our proven task order response process provides for efficient and streamlined delivery of your engineering support needs.

- **Staff Task Orders with Professionals who Understand your Technical Needs**
  Our team structure provides San Elijo with Southern California engineering and construction professionals who have worked on similar wastewater projects and who can identify, advise, and implement creative solutions to your infrastructure needs.

Our history with San Elijo goes back many years, and we hope to continue this relationship with our local team who are ready to serve you.

We look forward to the opportunity to discuss how CDM Smith can support San Elijo with ongoing O&M and capital project implementation. If you have questions in the meantime, please do not hesitate to contact me at (760) 415-4338 or falktc@cdmsmith.com.

Sincerely,

Tom Falk, PE
Client Service Leader
CDM Smith Inc.

Consultant Information

Legal Name and Address:
CDM Smith Inc.
703 Palomar Airport Road, Suite 300, Carlsbad, CA 92011

Legal Form of Company:
Corporation

Parent Companies: None

Addresses of Offices in San Diego County: same

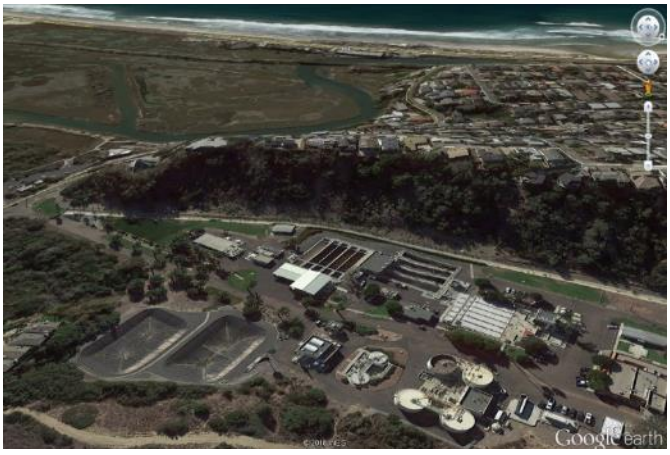
Number of Employees in San Diego County: 40

Point of Contact:
Tom Falk, PE
M: (760) 415-4338,
O: (760) 710-4668
falktc@cdmsmith.com

1.Understanding

Serving the cities of Encinitas, Solana Beach, Del Mar and surrounding communities, San Elijo Joint Powers Authority (San Elijo) is responsible for treatment/disposal of approximately 3 million gallons per day (mgd) of wastewater and production/delivery of approximately 1,200 acre-feet per year (AFY) recycled water. Originally constructed as a primary treatment plant by the County of San Diego in the 1960s, what is now known as the San Elijo Water Reclamation Facility (SEWRF) has undergone several major facility upgrades and expansions, notably conversion to full secondary in the early 1990s, tertiary treatment expansion in the early 2000s, and the addition of advanced water treatment in 2010.

With a lean staff, San Elijo efficiently operates and maintains the plant, off-site reservoirs, pump and lift stations, and the distribution system. With this contract, San Elijo will expand the depth and breadth of its resources to support ongoing operations and maintenance (O&M) and capital infrastructure upgrades. San Elijo's goal is to streamline access to local consultant services. Led by Contract/Project Manager Tom Falk, our locally-based, multidisciplinary team of experienced staff will be available to consistently provide engineering services during the on-call contract period. Our team will work collaboratively with San Elijo to achieve optimal results. The CDM Smith team is committed to making sure San Elijo is supplied with qualified staff and resources that are tailored to your task orders throughout the duration of the contract(s). Through this engagement, San Elijo and CDM Smith will reestablish a valuable, productive relationship, providing the Authority with the confidence that reliability of plant operations will be maintained in a cost-effective manner.



CDM Smith has proudly served public agency clients in North San Diego County for over 30 years including management and project/program oversight for SEJPA where we implemented major capital improvement programs at the SEWRF including full secondary upgrades, outfall upgrades, capacity expansion, and the implementation of the recycled water program.

2. Approach

Approach to On-Call Contracts and Task Order Management

The foundation of our approach is open communication, responsive service, and thorough technically accurate work products on each on-call task order.

- We will practice **proactive contract management,** maintaining regular communication with San Elijo's staff to allow us to plan our resources, familiarize our team with project-specific issues, and achieve timely response.
- Task order **responses will be prompt and thorough** so that work products are accurate and meet San Elijo's goals and objectives.
- Task order execution will focus on delivering the carefully-defined **scope of services in accordance with the authorized budget and proposed schedule.**
- Our goal is to establish a long-term relationship with San Elijo, and we will solicit feedback throughout the project and at close-out of each task order so that we can refine our service offering to **make sure San Elijo's expectations are being met.**

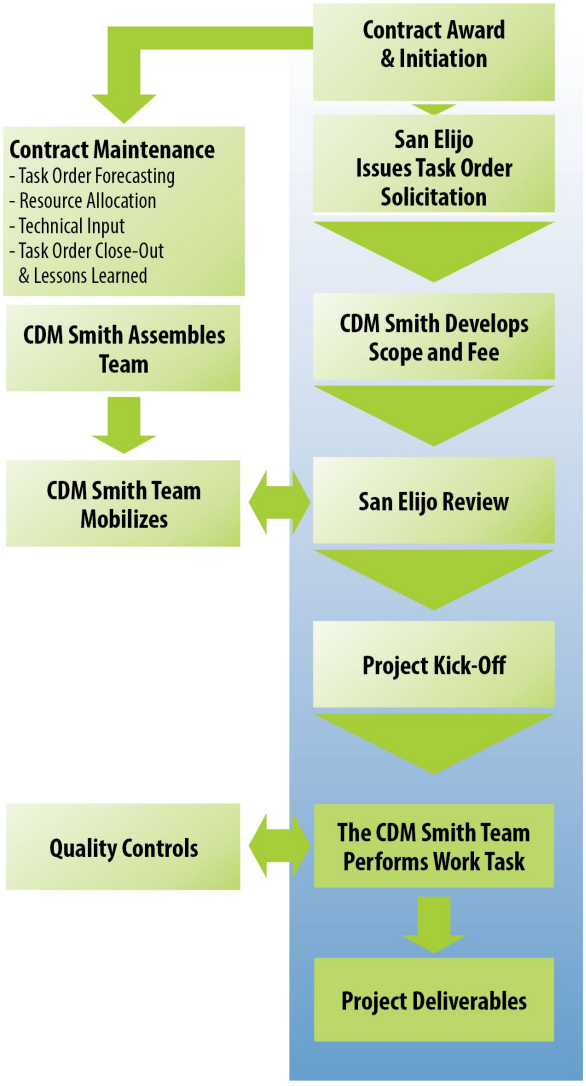
CDM Smith maintains rigorous project controls and reporting tools that allow our project management team to monitor budgets, schedules, and identify issues in time to apply corrective action. We will maintain an open line of communication with San Elijo so that budget and schedule issues can be addressed before the compromise of quality occurs or results in delays.

Understanding that on-call contracts require a special level of commitment, we have proposed local contract/project and task managers to make certain of responsiveness, and have structured our leadership team to align with the major categories of anticipated task orders: special studies, conveyance, and facilities.

Our team will be led by our proposed Contract/Project Manager, Tom Falk, who has managed on-call contracts and executed task orders for six California Special (water) Districts and municipalities throughout Southern California. Our highly qualified managers will lead task order teams drawing on the breadth and depth of CDM Smith's industry-leading professionals.

A key feature of our approach to this on-call will be "contract maintenance, by which we will establish a continuous line of communication before, throughout, and between task orders. Through these proactive efforts, the process of scoping task orders will be streamlined and ultimately confirm our delivery of specific assignments to meet your needs.

The **flow chart to the right** illustrates our proposed approach to this On-Call Engineering Contract. **A key point in this continuous communication cycle is to verify that we are receiving timely feedback** so that we can adjust our delivery for ongoing and future task orders. The valuable feedback that we learn from you during the communication cycle will provide us with the knowledge and process details we need to meet your expectations, and will enable us to appropriately augment San Elijo's staff capacities.



Proven Track-Record on Task-Order Based Contracts

CDM Smith has over 170 staff in Southern California and over 5,000 employees across the firm. This extensive depth allows us to effectively manage resources and provide rapid responsive service for on-call contracts. **Over the past 10 years, in California alone, we have maintained over 70 as-needed contracts and successfully executed over 350 discrete task orders.** These task orders range from tens of thousands of dollars to hundreds of thousands of dollars, with the median value being approximately $100,000.

Permitting

CDM Smith routinely processes permits associated with projects we are planning / designing, and implementing permit requirements in various roles during construction. We have completed dozens of projects in San Diego County, including delivery and operation of facilities under the San Diego Regional Water Quality Control Board. CDM Smith has a full-service environmental permitting group, advising and assisting agencies through the CEQA, CEQA+, and NEPA process. With this working experience and local familiarities, we are prepared to process permits for San Elijo.

AutoCAD

The contract drawings will be prepared to match the San Elijo's standard drawing size using the AutoCAD software package.

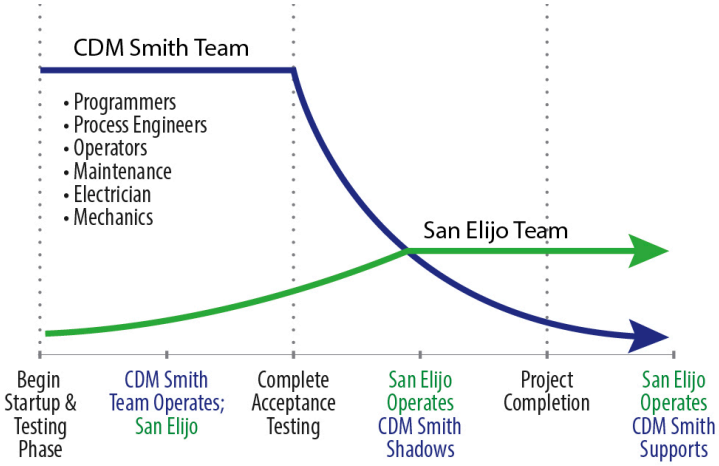
Performance Optimization and Training

CDM Smith routinely consults to agencies for treatment process optimization and training on a variety of treatment processes. The following discussion presents a typical approach applied to optimizing a MFRO process. Membrane filtration/reverse osmosis (MFRO) process, as an example of services our regional O&M staff can support.

Training O&M Personnel

The key to successfully optimizing current operations or transitioning operations of newly constructed systems to San Elijo staff is early engagement of our in-house start-up and operations teams along with collaboration with San Elijo. Our O&M team will remain engaged through all phases of the on-call project.

We will use a proven method for training San Elijo's O&M staff as illustrated in the **figure to the right.** We have seen firsthand, how O&M staff shadowing our start-up operators is an effective way to build operator knowledge and understanding. This is followed by our start-up operators shadowing O&M personnel as they perform hands-on operation, demonstrating and perfecting what they have learned. The result—a smooth transition and handoff.



Approach to Optimizing Membrane Systems

The MF/RO treatment processes are the heart of the reclamation facility and must be managed effectively to maintain membrane warranties, meet product water goals and minimize power/chemical use.

Using a shadowing process, as depicted in the following graph, CDM Smith staff will:

- Use membrane data templates (MF and RO) to compile and analyze raw data;
- Interpret the results of the graphs/trends produced by the MF and RO data templates;
- Monitor performance over short- and long-term operation to detect performance losses before they become irreversible;
- Assess the effectiveness of, and make adjustments to, routine cleaning sequences (maintenance cleans and CIPs).

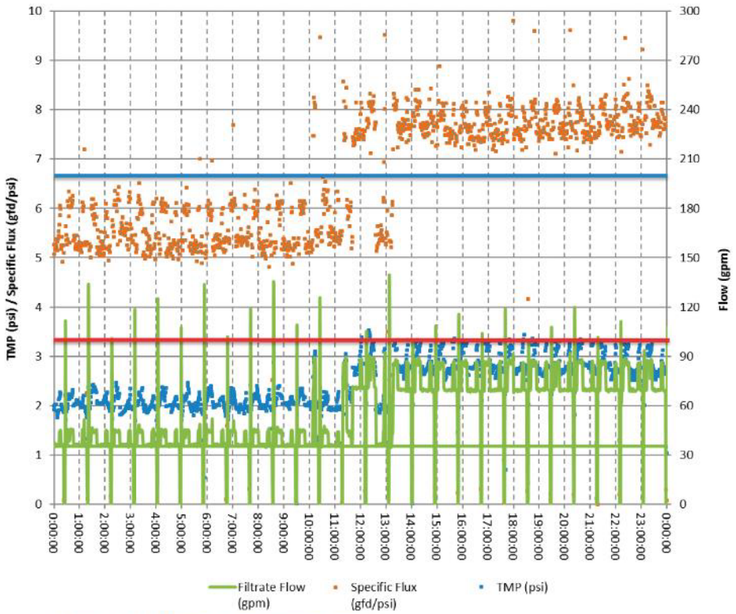
Running Daily Performance Reports for MF Systems

With MF systems, it is critical to analyze temperature compensated (normalized) data over a daily, weekly, and monthly time-frame. This is because the various cleaning mechanisms (air/water backwashing, maintenance cleaning with small chemical doses, and CIPs with larger chemical doses) occur at different intervals and must be assessed both individually, and overall. Without this regular and punctual analysis, it is possible to build up fouling layers on the membranes that increase operating pressures, decrease the time between cleaning sequences, and ultimately prove irreversible.

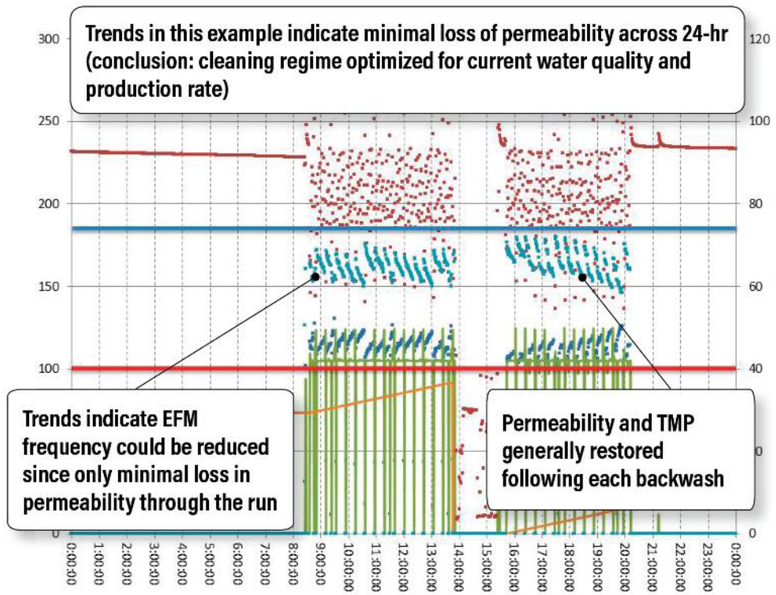
To address the criticality of regular data analysis, we will configure a project-specific, Excel-based data analysis template to compile key MF performance data that is capable of automatically generating 24-hr reports. These reports will allow the operators to monitor daily performance and make adjustments to the backwashing frequency, which typically occur every 30 to 60 minutes, depending on feed water quality. When these reports are combined over a week, it will be possible to assess the effectiveness of the maintenance cleaning, which involves small chemical doses, typically sodium hypochlorite, that generally occur every two to four days. Finally, when combined over a month, this data will be used to confirm the effectiveness of stronger chemical CIP process, which typically occurs every 30 days and involves both high and low pH cleaning sequences circulating through the membranes over several hours. At the completion of a CIP, the operators will check to make sure that clean membrane (baseline) conditions have been restored.

In **the table below,** we provide an example 24-hr MF daily performance report. It is critical that these reports trend both the transmembrane pressure (TMP) and permeability against the filtrate flow. A desired permeability operating band (indicated by the red and blue lines) will be established by CDM Smith's commissioning team (Cx), and this will assist the operators in assessing the current state of operation, the need for a CIP, and the effectiveness of the CIP.

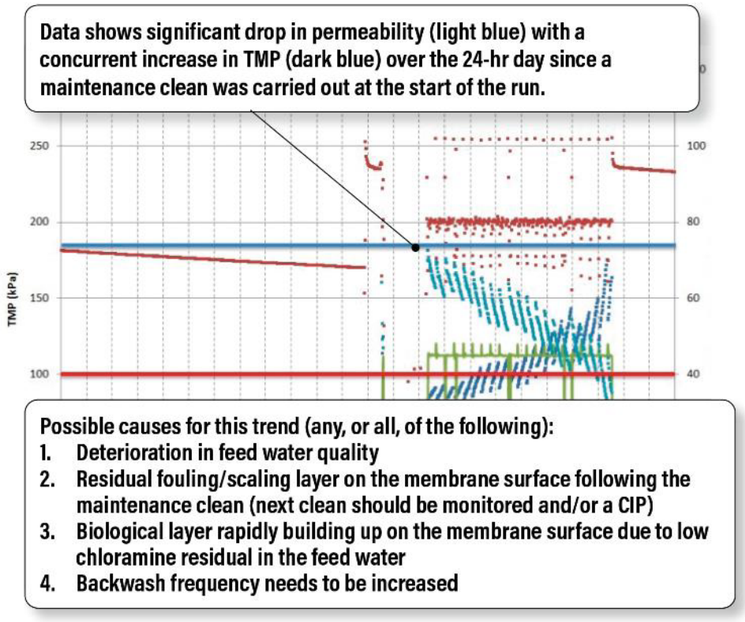
Parameter	Significance
TMP	▪ TMP = Feed Pressure – Filtrate Pressure ▪ Indication of the cleanliness of membrane surface ▪ Function of the Filtrate Flow (increases with flow) ▪ CIP is required when the TMP > 20 psi
Filtrate Flow	▪ Flow rate at which the MF system was operating ▪ Indicates when the MF system was online/offline
Permeability	▪ Normalized calculation and is used to remove the effect of flow and temperature on membrane performance data by referencing everything to a standard temperature (20oC is the industry standard) ▪ Clean membrane permeability will be established during Cx once the membranes have been installed and operated under design conditions for three to four days



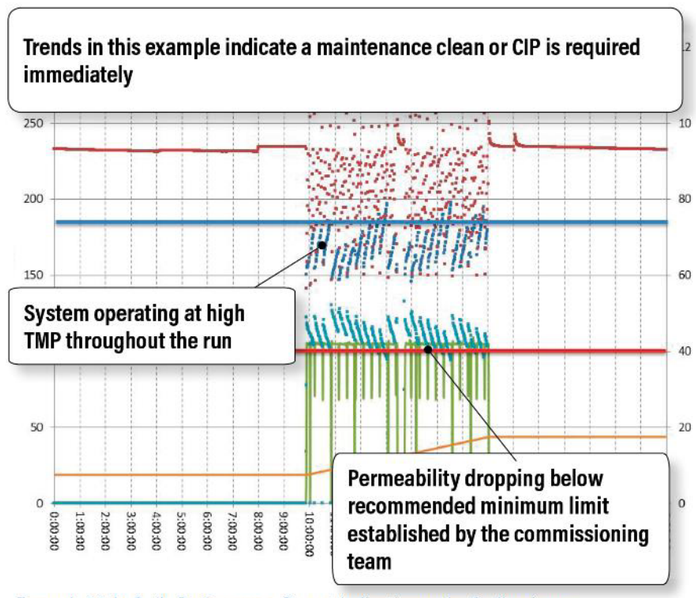
Example 24-hr MF Daily Performance Report



Example 24-hr Daily Performance Report indicating no operational issues



Example 24-hr Daily Performance Report indicating potential fouling issues



Example 24-hr Daily Performance Report indicating major fouling issues

Interpreting MF Performance Data

With MF, the operator's primary focus is determining whether the operation of the UF system is sustainable for the current water quality and production rate. Cleaning setpoints (air/water backwash intervals, maintenance clean frequency, and CIP frequency) must be matched to the feed water quality and filtrate flow setpoint. During commissioning, CDM Smith's Cx team will generate an Operating Envelope that details each of the MF system's operator adjustable setpoints and the acceptable range they can be adjusted within.

Dirty water, or higher production rates, will require more frequent cleaning of the membranes. Excessive cleaning, however, should be avoided as this will result in premature degradation of the membranes, excessive chemical consumption, and increased down-time. When reviewing the daily reports, the operator will look for the following process indicators:

- Daily rate of increase in TMP (How quickly is TMP increasing?);
- Maximum TMP value reached (Is TMP nearing, or exceeding the recommend limit before a maintenance clean occurs?);
- Rate of decrease in permeability (How quickly is permeability decreasing?). This should follow a similar, albeit, inversely proportional trend to TMP (i.e. as TMP increases, Specific Flux decreases);
- Minimum permeability value reached during the day (Is it nearing, or dropping below the limit established by the commissioning team before a maintenance clean occurs?); and
- Permeability after a maintenance clean or CIP (Has it been restored to the original clean value established by the commissioning team?).

The **four figures** are labeled with information related to interpreting the data and how it can be used by the operator to monitor plant performance and diagnose potential operational issues.

MF Maintenance Clean and CIP Cleaning Sequences

Both the CIP and maintenance cleaning sequences should be reviewed by the operator as often as feasible to determine their effectiveness, and to decide if changes need to be made (or if clean, should be pulled forward in advance of the next scheduled event). They may also need to be adjusted due to seasonal changes.

It is important to note that since the maintenance clean is an automatic process, it can occur during unmanned hours. Although online instrumentation (pH/ORP) provides some idea of the cleaning conditions that occurred during the clean, it is important for the operator to review the trends for TMP and permeability following each event in order to verify the clean was successful.

Regular grab sampling of the recycled cleaning solution during chemical cleans will also be implemented to confirm free chlorine concentrations during sodium hypochlorite cleans, as well as to verify instrument calibrations.

Quality Control and Quality Management Approach

We understand that our reputation is staked on the quality of the product and service we provide to our clients. CDM Smith's Quality Management System (QMS) is built on a foundation of consistent, regular record keeping and quality procedures that our teams carry out daily on projects around the world.

Every project, including each task order that would arise out of this on-call contract with San Elijo, is planned with careful consideration for quality control processes tailored to the scope and scale of the assignment. A cornerstone of our Quality Control (QC) process is the input of "lead practitioners" (senior technical staff identified as experts in their field of practice) throughout the project development and independent review of work products to verify technical accuracy, to avoid inter-discipline conflicts, and to identify and manage project risks in consultation with San Elijo.

Upon acceptance of the task order and notice to proceed, CDM Smith will execute the scope of work. Depending on the complexity of the project, the first task will typically entail gathering background information and facilitating a team meeting between the CDM Smith team and appropriate personnel at San Elijo to set common goals and expectations. We have the technology, systems, and processes in place to serve and deliver technical excellence. Some of our tools and processes include:

- **Video Conferencing** – Our project managers have increased the use of video conferencing to keep all engaged, confirm open communications, identify challenges, develop solutions, and celebrate progress.
- **Virtual Reviews** – Teams can work virtually in the same document at the same time to advance the work product simultaneously, saving time and money.
- **Secure Document Storage & Accessibility** – We have made significant investments in our network and cloud environment, ensuring the security and accessibility of your work products.

3. Firm Qualifications

CDM Smith provides integrated solutions in water, environment, transportation, facilities, and energy to public and private clients worldwide. We are recognized for excellence in the management and collaborative execution of complex projects ranging from consulting and design services through construction and operations. These services amount to more than $1.2 billion in annual revenues, delivered by 5,000 professionals located in 125 global offices. These services are focused on our client's needs with teams formed specific to meet their technical and administrative requirements.

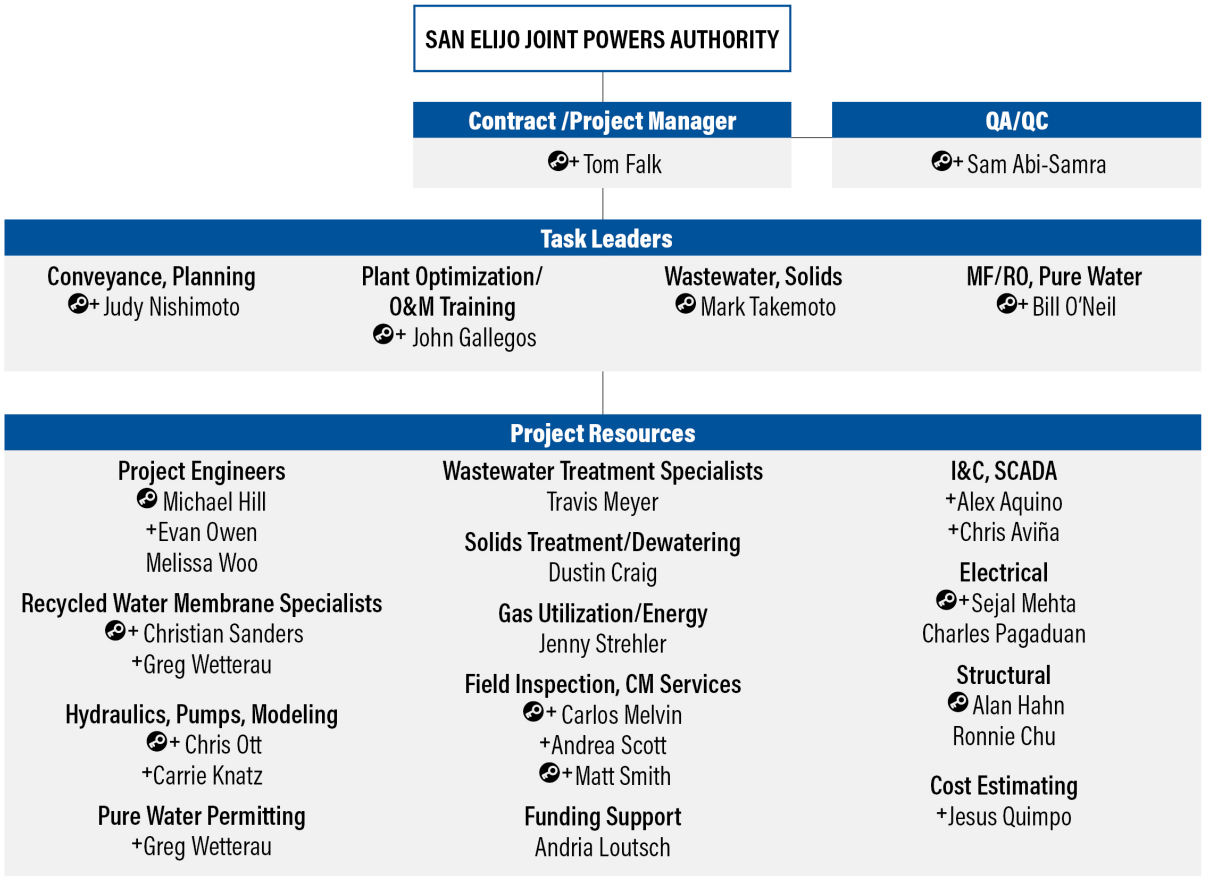
CDM Smith has served San Diego County public agencies for more than 30 years, partnering with local agencies such as San Elijo, to deliver cost-effective solutions to their unique water, wastewater, and recycled water needs. With 46 employees in the County of San Diego, our office is primarily focused on the water industry and our local resources include senior staff specialized in treatment, facilities, and conveyance. Within San Diego County, CDM Smith has designed major projects at more than 10 treatment plants as well as pipelines, pump stations, and reservoir infrastructure identical to San Elijo's facilities. We have successfully delivered more than $500 million in built wet infrastructure in San Diego County over the past decade. Through this collective experience, CDM Smith is uniquely qualified to provide San Elijo with the full suite of services necessary to support your ongoing operations and capital improvement projects (CIPs).

The CDM Smith team has relevant O&M of infrastructure project experience, as well as wastewater treatment plant operations, staff training, treatment optimization studies and modeling experience. Our local team can quickly respond to task orders, providing efficient services on an on-call basis.

4. Key Personnel Qualifications

Team Resources

CDM Smith is a full-service, multidiscipline engineering, construction, and environmental consulting firm. We have over 40 water-focused professionals based out of our Carlsbad office. Having 170 professionals across our Southern California allows us the flexibility to mobilize immediately during any project emergencies. Our team will be able to be on-site full-time or part-time to meet the needs of each project throughout the duration of each contract period.



+Located in Southern California offices, Carlsbad, Irvine or Rancho Cucamonga

Indicates key personnel based on anticipated assignments through On-Call Engineering Services Contract, 2021-22.

Resumes for our 10 primary key team members are in the Appendix.

Key Personnel

Tom Falk, PE, PMP | Project Manager – Carlsbad, CA

Tom Falk is CDM Smith's Client Services Leader for the San Diego region. Tom will apply his institutional knowledge of the SEWRF and strong relationships with SEJPA staff to make sure CDM Smith's approach and delivery are closely aligned with SEJPA's objectives. Tom has worked throughout San Diego County on facility planning, design, construction and alternative delivery projects. Tom also has extensive field experience as construction manager and resident engineer on over $50M of water and wastewater infrastructure in the Coachella Valley, providing him with a thorough understanding of the project life-cycle.

Years of Experience: 20 | **Education:** BS, Civil Engineering, San Diego State University

Registration: Professional Civil Engineer, CA

Sam Abi-Samra, PE, BCEE, PMP | QA/QC – Carlsbad, CA

Sam Abi-Samra is our regional water Technical Delivery Manager, overseeing west-coast staff. Sam is based in Carlsbad and has been intimately involved in many of CDM Smith's projects within the region for over 15 years. Sam routinely leads and/or serves in a senior QA/QC role for CDM Smith's most complex water and wastewater projects throughout Southern California, including design-build and fast-tracked projects.

Sam was the design manager for the City of Oceanside San Luis Rey Water Reclamation Facility (SLRWRF) Tertiary Treatment Plant Expansion ($13M, design/build) and the South Regional Tertiary Treatment Plant at Camp Pendleton ($70M, design/build).

Years of Experience: 35 | **Education:** MS, Civil Engineering, University of Kansas; BS, Civil Engineering, University of MO, Columbia

Registration: Professional Civil Engineer, CA

Judy Nishimoto, PE, PMP | Task Leader - Carlsbad

Judy is an environmental engineer and project manager with over 20 years of experience in civil engineering. She has managed multidiscipline design teams resulting in successful delivery of a multitude of projects within schedule and budget. She leads task order projects on a regularly for the Los Angeles Department of Water and Power and understands the need for efficient, responsive services that meet schedule and budget.

Judy served as the deputy project manager for the Sanitation Master Plan for the CVWD, working closely with Tom and directing our process team for this comprehensive treatment, collection system, and recycled water facility planning document. She was also responsible for the startup and testing of a 12-mgd tertiary membrane filtration system at the new wastewater treatment plant at Joint Base Lewis-McChord in Washington state, and presented a strategy for long-term reliable operations and storage of non-utilized filtration skids.

Years of Experience: 20 | **Education:** MS, Environmental Engineering, Northeastern University; BS, Civil Engineering, Brigham Young University

Registration: California license is in process

	PROJECT ENGINEERS
	Michael Hill, PE | Project Engineer – Bellevue, WA
	Michael is an environmental engineer specialized in water treatment projects and is experienced in all phases of engineering from planning, design, and construction. Michael was instrumental in the successful design of the Headworks Upgrades and Emergency Generator projects at the SEWRF. He possesses expertise in facility hydraulics, pumping systems, chemical feed facilities, and control systems. He is responsible for detailed design and layout, civil/mechanical calculations and analysis, equipment selection, functional loop descriptions, cost estimation, and development of plans and specifications. **Years of Experience:** 11 | **Education:** BS, Civil Engineering, San Diego State University **Registration:** Professional Engineer, CA
	Evan Owen | Project Engineer - Carlsbad, CA
	Evan has experience in research, design, construction, and operation of water facilities. He has experience studying advanced disinfection, membranes, and nitrogen and phosphorous removal. His design, construction, and operation experience includes on-site roles at full-scale water and wastewater treatment facilities working in both an environmental consulting and water utility environment. Evan is currently serving as Staff Engineer on an O&M analysis report for IEAU's WWTP Regional Plant Expansion. His responsibilities include data analysis on staffing evaluation, staffing estimate by process, O&M cost, and benchmarking. **Years of Experience:** 4 | **Education:** MS, Environmental Engineering, University of Colorado; BS, Civil Engineering, University of New Hampshire
	RECYCLED WATER MEMBRANE SPECIALISTS
	Christian Sanders | Recycled Water Membranes - Carlsbad, CA
	Christian is a senior environmental engineer with experience spanning the Americas and Australia/ New Zealand in the areas of water treatment design development (seawater desalination, recycled water and conventional surface/groundwater treatment), treatment plant commissioning, large-scale pilot plant testing (desalination and fresh water), bench-scale testing, and implementation of operational optimization programs. His relevant projects include current U.S. Army Corps of Engineers, Ft. Irwin, CA on their Water Treatment and Distribution System; Bundamba Advanced Water Treatment Plant (Brisbane), Desalination Pilot Plant Project (Sydney), and the Douglas and Northern WTPs Optimization Program (Townsville), Australia. **Years of Experience:** 20 | **Education:** MPS, Agricultural and Life Sciences, Cornell University; BS, Environmental Engineering, University of Florida

	Greg Wetterau, PE | Recycled Water Membrane Specialist - Rancho Cucamonga, CA
	Greg has 26 years of experience and is an internationally-recognized industry leader in process and system design for membrane filtration and advanced wastewater treatment facilities, helping deliver 20 potable reuse projects around the world. Mr. Wetterau brings extensive qualifications in the design, procurement and facility start-up of 60+ membrane treatment facilities, working directly with 15 different membrane element and system providers. Mr. Wetterau has been a driver of change in the membrane and reuse industries, pioneering the use of open platform membrane systems, conducting the first full-scale testing of UV/chlorine for potable reuse, and leading the process design and permitting for the first two potable reuse facilities permitted under California's Groundwater Replenishment Reuse Regulations. **Years of Experience:** 26 | **Education:** MS, Environmental Engineering, University of Illinois; BS, Civil Engineering, University of Illinois; BA, Liberal Arts, Wheaton College **Registration:** Professional Engineer, CA
	HYDRAULICS, PUMPS, MODELING
	Chris Ott, PE | Hydraulics, Pumps, Modeling - Carlsbad, CA
	Chris is CDM Smith's regional pumping and hydraulics expert and routinely engages on complex pumping system projects, including modifications to existing stations to improve performance. He has recently been involved in hydraulic transient modeling of the Perris Desalter raw water transmission system for Eastern Municipal Water District. Chris was the lead project engineer for the Orange County Sanitation District's (OCSD's) headworks and influent pump station modification project at Plant 2 that included field pilot testing, dynamic and physical modeling of the 320-mgd influent pump station. He will support pump station and hydraulic analyses, oversee hydraulic modeling on task orders requiring these services. **Years of Experience:** 17 | **Education:** BS, Civil Engineering, Colorado State University **Registration:** Professional Engineer, CA
	Carrie Knatz, PE | Hydraulics, Pumps, Modeling - Carlsbad, CA
	Carrie is a senior engineer with 20 years of experience in the design of water and wastewater projects, specializing in hydraulics. She is a recognized leader in the application of CFD modeling for water treatment design. Her experience covers a broad range of disciplines, including hydraulic profile modeling, pipeline design, and water supply planning. Carrie has performed 14 CFD analyses of various designs specifically to investigate chemical mixing performance and has performed over 100 analyses for other applications, including flow splitting structures, ozone and chlorine contactors, chemical mixing, water storage facilities, clarifiers and sedimentation basins, pump station wet wells, and aeration grit basins. She recently served as CFD Task Manager responsible for CFD modeling for OCSD's P2-122 Headworks Modifications and the Marine Corps Base Camp Pendleton's WWTP. **Years of Experience:** 20 | **Education:** MS, Environmental Engineering, University of California, Irvine; BS, Civil Engineering, Florida Institute of Technology **Registration:** Professional Engineer, CA

	ELECTRICAL, I&C, SCADA
	Sejal Mehta, PE | Electrical, I&C, SCADA - Irvine, CA
	Sejal has ten years of experience in the analysis of electrical transmission and distribution systems, including short circuit analysis, coordination studies, load flow and arc flash calculations, and cost estimating. She has expertise in commissioning and start-up field services, performing electrical system studies using ETAP, SKM, and Aspen power system tools. Sejal has designed and analyzed electrical substations, power plants, and electrical systems for water, wastewater, and pump stations. Sejal is currently working directly with Tom on electrical and SCADA designs for Encina and Inland Empire Utilities Agency (IEUA). **Years of Experience:** 8 | **Education:** MS, Electrical Engineering, University of Denver; BE, Jawaharial Nehru Technical University **Registration:** Professional Electrical Engineer, CA
	Alex Aquino, PE, PMP | Electrical, I&C, SCADA - Carlsbad, CA
	Alex is a senior automation engineer with over 16 years of experience leading the design of instrumentation P&IDs, SCADA, HVAC, CCTV, and access control systems for small to large projects including water/wastewater treatment plants, pump stations, aeration systems with blowers, air stripper, desalination plants, ultraviolet (UV) and carbon addition systems. Alex's field experience includes plant startups, witness testing and construction management services. He recently served as I&C Task Lead for IEUA's Regional Water Recycling Plant and previously worked on the Marine Corps Base Camp Pendleton Water Distribution, providing controls design that provided full control and monitoring at a new combined booster pump station. **Years of Experience:** 16 | **Education:** BS, Electrical Engineering, Manhattan College **Registration:** Professional Engineer, CA
	Chris Aviña, DBIA | Electrical, I&C, SCADA - Rancho Cucamonga, CA
	Chris has 20 years of experience in the fields of electrical and I&C. He served as CDM Smith's I&C Project Manager for a wastewater treatment plant at Marine Corps Base Camp Pendleton where his responsibilities included design and supervising fabrication of 2 PLC control panels, SCADA Hardware/Software, supervising fabrication of analytical control panels, generating instrument ISA data sheets, procuring field instruments, scheduling instrument delivery, and field instrument calibration. Chris also provided field instrumentation technical support to field electricians and assisted in loop validation testing prior to field start-up of PLC and field instrumentation. He was also the project manager for the design-build SCADA System Upgrade project for the City of Pomona. **Years of Experience:** 25 | **Education:** National Education Center, Los Angeles Trade-Technical College

	STRUCTURAL
	Alan Hahn, PE, SE | Structural - Phoenix, AZ
	Alan is a structural engineer with 15 years of experience managing structural assessments, design, and construction services on water, wastewater, and recycled water projects. He has completed various WWTP projects in seismic areas in Southern California, both in new facilities and expansions/modifications to existing facilities. Alan was the lead structural engineer for the Primary Area Improvement Project at Encina Water Pollution Control Facility, Oceanside SLRWRF, and ongoing design of Carbon Canyon Water Reclamation Facility (WRF) improvements for IEUA. **Years of Experience:** 14 | **Education:** M Eng, Structural Engineering, University of Michigan; BS, Civil Engineering, Michigan State University **Registration:** Professional Electrical Engineer, CA, Structural Engineer, CA
	Ronnie Chu, PE | Structural - Phoenix, AZ
	Ronnie is a structural engineer with experience in the structural design for environmental, commercial, industrial, and governmental facilities. His structural design experience includes load determination and analysis, structural element design, detailing, and drafting. Ronnie is serving as lead structural engineer for the Encina Wastewater Authority Primary Area Improvement Project and SCADA Network Infrastructure Improvement Project. He retrofitted the existing structure to add a SCADA room and designed a new masonry structural with partial internal mezzanine. **Years of Experience:** 9 | **Education:** MS, Structural Engineering, University of California, San Diego; BS, Structural Engineering, University of California, San Diego **Registration:** Professional Civil Engineer, CA
	FIELD INSPECTION, CM SERVICES
	Matt Smith, CCM | Field Inspection, CM Services - Carlsbad, CA
	Matt is CDM Smith's regional construction management leader. He has managed the construction of water and wastewater plants throughout Southern California, including related building and support facilities. Matt was part of the City of San Diego's Point Loma WWTP, including expansion to existing maintenance building, construction of new three-story North Operations Building consisting of operations and control facilities, centralized SCADA, and a new laboratory. Matt also has experience as a contractor with construction of facilities and infrastructure, as well as alternative project delivery. Matt is currently serving as Sr. Construction Manager for a $100+ million headworks project in San Jose and providing technical oversight for our field team at the Santa Fe Irrigation District (SFID) R.E. Badger Filtration Plant. **Years of Experience:** 28 | **Education:** BS, Construction Management, California Polytechnic University, San Luis Obispo **Certification:** Certified Construction Manager

Carlos Melvin | Field Inspection, CM Services - Carlsbad, CA

Carlos is a senior field engineer specialized in construction quality control, inspection, and construction management. He served as the Quality Control Manager for various projects under the Marine Corps Base Camp Pendleton Design-Build-Operate-Maintain and the Fort Irwin Design/Build project, responsible to the owner for managing QC procedures, including weekly meetings, reports, and administering the preparatory and initial meetings for field quality control. Carlos also served as on-site resident engineer for the Miramar WTP Expansion for City of San Diego, which included construction of a new operations building. Carlos served as on-site quality control manager for a $14 Million CMAR project for the City of Avondale, Arizona. Carlos is the on-site resident engineer leading a full-service construction management team for two contracts at SFID totaling $13 million.

Years of Experience: 21 | **Education:** BS, Environmental Resource Engineering, Humboldt State University

Certifications: NAVFAV Construction Quality Control Manager

Andrea Scott | Field Inspection, CM Services - Carlsbad, CA

Andrea is a civil engineer with experience in design and construction support services. Typically functioning as a project engineer, she is well versed in programs such as AutoCAD, WaterCAD, and MS Office to produce construction documents and is experienced in interpreting construction documents and managing workflow of project execution. Andrea is providing field engineering support as Project Engineer on Encina Wastewater Authority's Primary Area Improvement Project and SCADA Network Infrastructure Improvement Project, as well as CDM Smith's two contracts at the SFID R.E. Badger Filtration Plant.

Year of Experience: 6 | **Education:** BS, Civil Engineering, California State Polytechnic University Pomona

COST ESTIMATING

Jesus Quimpo | Cost Estimating - Rancho Cucamonga, CA

Jesus is a construction management professional with over 25 years of experience in estimating of water/wastewater projects. He has extensive experience working directly for owners, contractors, and public agencies in Southern California. He is well versed in utilizing estimating tools such as MS Excel, AutoCAD, Navisworks, Bluebeam, RS Means, Revit MEP, Hard Dollar and Timberline. Jesus has also utilized Primavera P6 for resource loaded scheduling. He is adept in the development of construction estimates and constructability reviews for design-build delivery projects, as well as hard bid projects. He served as cost estimator calculating $37 million for the CVWD Sanitation Master Plan Update, a long-term CIP in a phased program for all CVWD sanitation facilities. Jesus will use current market cost information to provide San Elijo with construction cost estimates that it can confidently use for planning purposes.

Years of Experience: 25 | **Education:** BS, Civil Engineering, University of Petroleum & Minerals, Dhahran, Saudi Arabia

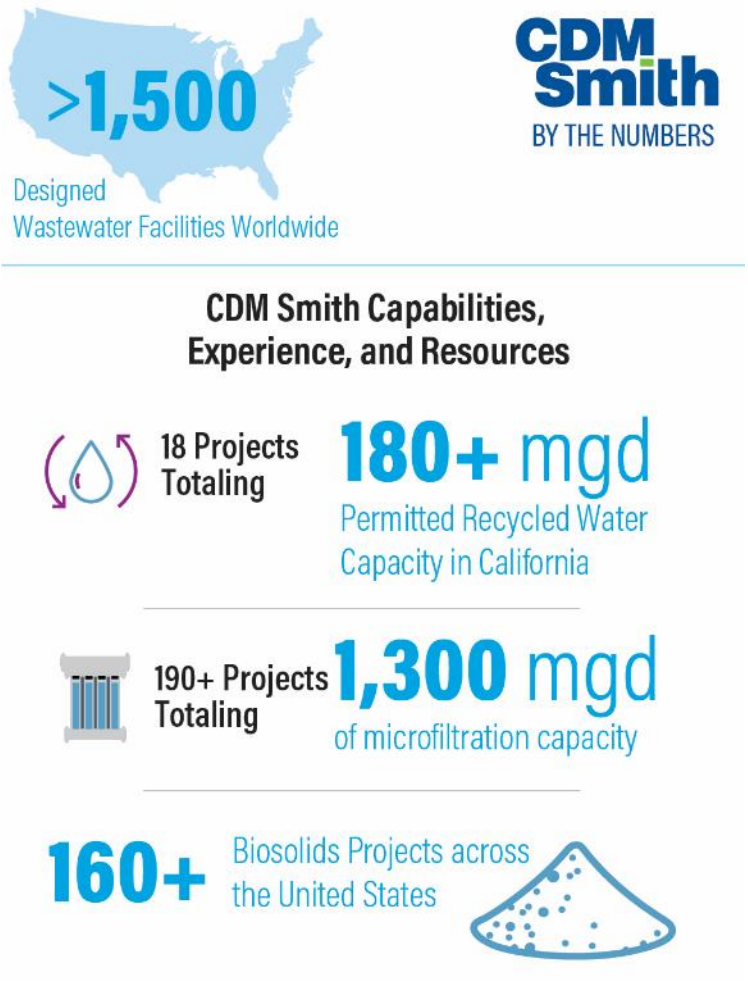
	FUNDING SUPPORT
	Andria Loutsch, AICP, PMP | Cost Estimating – Concord, CA
	Ms. Loutsch is a water resource planner and project manager with over 20 years of experience in recycled water planning, grant funding and financing, and California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) environmental evaluations (e.g., EIR, EIS). She has successfully prepared recycled water and wastewater loan and grant funding applications that have awarded over $240 million in federal and state grants and loans for her clients. **Years of Experience:** 24 | **Education:** BS, Economics, Massachusetts Institute of Technology **Certifications:** American Institute of Certified Planners, Project Management Professional, Project Management Institute

5. Project Experience and References

CDM Smith's local leadership team is highly qualified and offers in-depth experience in the delivery of water, wastewater, and recycled water facilities. Within San Diego County, we have completed influential planning studies, designed major projects at more than 10 treatment plants, designed pump stations, reservoirs, recycled water pipelines, and completed over 100,000 linear feet of sewer rehabilitation. Over CDM Smith's 70+ years in the industry, we designed over 1,000 wastewater treatment facilities - ranging in capacity from less than 1 mgd to more than 850 mgd—and including the complete array of wastewater treatment, solids treatment, and reclamation technologies.

Our in-house expertise covers the entire range of unit operations and treatment processes used in WWTPs, including physical-chemical processes, biological processes such as activated sludge, solids processes such as thickening, digestion, and dewatering, and several variations. CDM Smith offers in-depth expertise as well as practical design and operational experience in advanced and emerging technologies such as biological nutrient removal, membrane bioreactors and other membrane treatment systems such as microfiltration and reverse osmosis (RO), ultraviolet (UV) disinfection, and advanced oxidation.

CDM Smith has a long history with San Elijo, providing management and project/program oversight for the implementation of major capital improvement programs at the SEWRF including full secondary upgrades, outfall upgrades, capacity expansion, and the implementation of the recycled water program.



Our key team members have supported more recent upgrades, including the headworks design project, electrical system upgrades, and the emergency power project. CDM Smith's familiarity with the region and unparalleled experience in delivering comparable CIPs makes us an ideal fit for supporting San Elijo through this on-call engineering contract.

Drawing on our institutional knowledge, we will partner with San Elijo's staff, truly functioning as an extension of your team. We look forward to the opportunity to partner with you in the successful delivery of your CIP, leading to a long-term relationship for years ahead.

Relevant Project Experience

CDM Smith has designed, constructed, operated, and maintained wastewater and water facilities throughout Southern California for nearly 40 years. This includes assisting clients with environmental studies and regulatory requirements. We are proud of our contributions to our North San Diego County community through major water and wastewater projects over the past decade, including the Carlsbad Water Reclamation Facility Expansion design-build, the San Elijo WRF Electrical Upgrades, Santa Fe Irrigation District's Raw Water Pump Station, San Diego's North City Advanced Treatment Plant design-build-operate, and design of Encina Wastewater Authority's Phase V Cogeneration project.

CDM Smith offers cutting edge wastewater process expertise and design proficiency—meeting our clients' needs for cost savings, quality, reliability, expedited schedules, and smooth operations. Our team will integrate these favorable outcomes into each on-call task order for San Elijo, resulting in multiple efficiencies during every stage of each project.

Experienced Team Led by Trusted Contract/Project Manager

Our Contract/Project Manager Tom Falk has direct hands-on experience with upgrades at San Elijo WRF, including preliminary design of the headworks upgrades project and the emergency power project. Tom is based in San Diego County and has extensive experience working with local agencies, providing him insights into local conditions. With a well-rounded resume, Tom is directly responsible for projects at over 20 similar treatment plants in Southern California and is also experienced in collection system and distribution systems, allowing him to effectively manage and deliver a wide variety of assignments.

The following feature projects highlight our team's experience with planning, design, construction services, and O&M for facilities similar to San Elijo's.

Encina Wastewater Authority |Implementation of Capital Improvement Program | Carlsbad, CA

The Encina Wastewater Authority operates, maintains, and administers the Encina Water Pollution Control Facility, which provides wastewater treatment service for six member agencies in northwestern San Diego County.

Primary Area Improvement Project

CDM Smith designed the expansion and upgrades of the headworks that will replace the screening equipment with new, tighter spaced multi-rake screens to improve the treatment level of service, construct a new grit and screening handling building, upgrade grit pumps and replace grit dewaterers. Electrical gear and equipment conduit/wiring will be completely replaced throughout the process area. Now in construction, CDM Smith is providing engineering services during construction, including resident engineering to support Encina's construction management team.

Phase V Energy Upgrades

CDM Smith supported the development of the comprehensive Energy and Emissions Strategy Plan that became the basis for the Phase V Expansion. CDM Smith subsequently designed the 3.0 MW cogeneration facility upgrade and aeration blower upgrades.

SCADA and Automation Planning

CDM Smith led a plant-wide automation audit using the Failure Modes and Effects Analysis, defining level of service and specific automation upgrade goals on a unit-process basis. The resulting SCADA Upgrades report defined a phased, plant-wide upgrade of the fiber optic network, SCADA software and hardware, control room upgrades, and replacement of all process area PLCs and RTUs. Subsequently, CDM Smith designed the backbone network infrastructure improvements consisting of new plant-wide fiber optic network, consolidated SCADA architecture, and new/modified redundant server rooms for SCADA and Business networks. The backbone infrastructure is being constructed in phased implementation, coordinated with ongoing, concurrent capital improvement project(s).

Encina Wastewater Authority, Mike Steinlicht, General Manager, T: (760) 438-3941, E: msteinlicht@encinajpa.com

Project Dates: Primary Area Improvement Project & SCADA Upgrades: 2016 – Ongoing (CIP work with client dating back to 2002)

Key Personnel: Tom Falk (Project Manager), Alan Hahn (Structural), Sejal Mehta (Electrical), Carlos Melvin (Project Engineer), Ronnie Chu (Structural), Evan Owen (Construction Svcs), Andrea Scott (Project Engineer)

Santa Fe Irrigation District |Washwater Tank Seismic Improvements and Clearwell Seismic Improvements | Rancho Santa Fe, CA

CDM Smith is providing construction management and inspection services for this $5.5 million project to implement seismic upgrades to two critical process tanks at the 40-mgd R.E. Badger Filtration Plant (REB Plant). The respective processes must remain in service at all times, requiring an extensive 20-mgd bypass pumping to allow the washwater tank modifications to be completed and a constrained sequencing plan to complete the structural modifications to the clearwell.

The Clearwell Seismic Improvements included unloading and constructing structural modifications to the 13 MG buried concrete tank to mitigate seismic hazards.

The Washwater Tank Seismic Improvements included a seismic retrofit of this 1 MG, 80 ft. tall welded steel tank, constructing new foundation ring-wall and micropiles below the tank.

CDM Smith is providing full-time on-site construction management and general inspection and as-needed special inspections. We are using a custom-built eBuilder document management system to control workflows and maintain consistent communication with the District. The project is currently progressing on a schedule to finish early and has not yet incurred any significant change orders.

This project is receiving federal FEMA Hazard Mitigation Grant funding and CDM Smith is monitoring compliance with that grant program.

Santa Fe Irrigation District
Marissa Potter, Associate Civil Engineer
T: (858) 227-5792
E: mpotter@sfidwater.org

Project Dates: 2020 - Ongoing

Key Personnel: Tom Falk (Principal-in-Charge), Matt Smith (Constructability Advisor), Carlos Melvin (Resident Engineer), Jesus Quimpo (Cost Estimating), Andrea Scott (Project Engineer)

Santa Fe Irrigation District | Mechanical Dewatering and San Dieguito Dam Improvements | Rancho Santa Fe, CA

CDM Smith provided construction management and inspection services for this $7.8 million project to expand the existing mechanical dewatering system at the 40-mgd REB Plant. The improvements include new buildings, electrical system, chemical and mechanical dewatering equipment.

The project also included structural modifications and improvements to the 100-year old concrete San Dieguito Dam.

CDM Smith is providing full-time on-site construction management and general inspection and as-needed special inspections. We are using a custom-built eBuilder document management system to control workflows and maintain consistent communication with the District. The project is currently progressing on a schedule to finish early and CDM Smith has effectively managed several owner-initiated change orders.

Santa Fe Irrigation District,
Marissa Potter, Associate Civil Engineer
T: (858) 227-5792
E: mpotter@sfidwater.org

Project Dates: 2020 - Ongoing

Key Personnel: Tom Falk (Principal-in-Charge), Matt Smith (Constructability Advisor), Carlos Melvin (Resident Engineer), Jesus Quimpo (Cost Estimating), Andrea Scott (Project Engineer)

Coachella Valley Water District | Sanitation Master Plan | Coachella, CA

CDM Smith recently completed a comprehensive update to Coachella Valley Water District's (CVWD's) Sanitation Master Plan (SanMP) and is now managing a CEQA+ Programmatic Environmental Impact Report. The planning effort included analytical assessment of capacity, condition, and level of service for 1,100 miles of collection system pipelines, 27 pump stations, and 5 water reclamation plants (18 mgd, 9.9 mgd, 5 mgd, 0.25 mgd and 0.1 mgd). To assess current plant performance and capacity, especially in light of water conservation impacts, CDM Smith's team conducted a focused inter-process sampling program in order to develop calibrated Biowin models. These models were evaluated against projected flow and loading conditions and for future nutrient limits so that plant upgrades account for growth and regulatory constraints. CDM Smith also updated CVWD's Biosolids Management Plan and recycled water facilities plans.

Centrifuges, shown here at 5 mgd WRP7 were assessed as part of the Biosolids Management Plan Update and serve as the basis for dewatering strategies at the other facilities.

Over 200 unique projects totaling over $800 million were identified across the collection and treatment systems, including condition-based rehab and replacements, capacity-driven expansions, and level of service upgrades to improve operational efficiencies. The projects were then prioritized based on weighted scoring through a workshop format with CVWD's leadership and field-level staff. The prioritized projects were then organized into five-year "bins" for implementation, phased over a 20-year planning period, balancing expenditures to fit within budgeted capital program funding based on projected service charge revenues.

CDM Smith's process team conducted extensive process sampling of the secondary process to calibrate process models to verify plant capacity under projected flow, loading, and regulatory scenarios.

CVWD, Donn Wilcox, Project Manager
T: (760) 398-2651/2421
E: dwilcox@cvwd.org

Project Dates: 2018 - Present

Key Personnel: Tom Falk (Project Director), Judy Nishimoto (Dep. PM), Travis Meyer (Process), Michael Hill (Project Engineer)

City of Carlsbad | Carlsbad Water Reclamation Facility Expansion | Carlsbad, CA

The pre-existing Carlsbad Water Reclamation Facility (CWRF) (completed in 2005) was based on taking secondary effluent the Encina Pollution Control Facility (EWPCF) and treating the flow through two parallel advanced treatment process trains. Treatment included continuous backwash granular media filtration and microfiltration (MF), and reverse osmosis (RO) for salinity. The product water from these two process trains are blended then chlorinated using sodium hypochlorite prior to product storage and distribution.

CDM Smith designed, constructed, and commissioned the 3 mgd microfiltration process depicted here using universal skids. Our team conducted O&M staff training to Encina's operating staff before turnover.

CDM Smith was retained under a progressive design/build contract to complete the CWRF Phase III Expansion, which included design and construction of treatment facilities and equipment to expand the capacity of the CWRF with an additional 3.0 mgd of disinfected tertiary recycled water that meets Title 22 of the California Code of Regulations for "unrestricted non-potable reuse". Project objectives included increased filtration reliability, enhanced operational flexibility, and improved stored recycled water quality.

CDM Smith designed, installed, and commissioned the expanded recycled water pumping station – installation of vertical turbine pump shown here.

The expanded facilities included a new skid-mounted universal skid MF train and expanded chlorine contact basins and chemical facilities.

This project is receiving State Revolving Fund (SRF) funding and Integrated Regional Water Management funding under Title XVI.

Carlsbad Municipal Water District, Scott Fisher, Municipal Contracts Manager
T: (760) 814-7226
E: sfisher@danapoint.org

Project Dates: 2018 - 2017

Key Personnel: Tom Falk (Client Service Leader), Chris Ott (QA/QC), Sam Abi-Samra (QA/QC), Alan Hahn (structural), Greg Wetterau (Project Technical Lead)

San Luis Rey Water Reclamation Facility | Recycled Water Treatment Plant, Design/Build | Oceanside, CA

The City of Oceanside's (City) water reclamation facility is located at the San Luis Rey Wastewater Treatment Plant, which treats up to 13.5 mgd of raw sewage to secondary effluent standards and discharges to the ocean. The tertiary treatment facility at was constructed in 1992 to treat up to 0.7 mgd of secondary effluent to provide Title 22 recycled water to nearby Oceanside Golf Course and Whelan Lake. In 2017, the City retained CDM Smith in a design/build contract replace the tertiary treatment facilities and provide on-site recycled water storage and distribution system pump station to serve new recycled water users in the City.

CDM Smith designed, constructed, and commissioned the 3 mgd tertiary plant expansion including disk filters (pictured above) and chlorine disinfection. Our team conducted O&M staff training to Oceanside's operating staff before turnover.

CDM Smith designed and constructed a fully automated, sustainable, and reliable 3- mgd (expandable to 6 mgd) recycled water treatment plant. The recycled water treatment plant included secondary effluent pump station, coagulant storage and feed system, flocculation basins, cloth disk filtration system by Five Star, chlorine storage and feed system, CCB, 2.0 MG pre-stressed concrete reservoir, and recycled water pump station. The recycled water pump station was designed to service existing demands and provided space and capacity for adding additional pumps to accommodate future demands and system changes. The project included a new electrical building to house electrical and control equipment for the tertiary treatment plant, and a new standby generator to provide backup power to the recycled water pumps. The project also included conversion of the existing on-site irrigation and non-potable water systems to recycled water.

CDM Smith's design included design features to verify compliance with Title 22 regulations, minimize process downtime, and allow for uninterrupted operation with minimal operator intervention. These design features included redundancy for major equipment with automatic switching and fault-alarming, and redundant compliance point monitoring analyzers; fully automated off-spec water diversion at the filters as determined by turbidimeter on the filter effluent and at the chlorine contact basins; and provisions for fail-safe disposal via existing ocean outfall. This project is receiving State Revolving Fund (SRF) funding and Integrated Regional Water Management funding under Title XVI.

City of Oceanside, Lindsay Leahy, PE
T: 760-435-5913
E: lleahy@oceanside.org

Project Dates: 2017 - 2019

Key Personnel: Tom Falk (Client Service Leader), Sam Abi-Samra (Design Manager), Alan Hahn (Structural)

Naval Facilities Engineering Command, Southwest | Southern Regional Tertiary Treatment Plant (SRTTP) | Oceanside, CA

CDM Smith joined a unique partnership with the United States Marine Corps and the Naval Facilities Engineering Command Southwest to design, build, operate and maintain (DBOM) a program to enhance the overall water and wastewater system operations and reliability at the Marine Corps Base, Camp Pendleton. Under the DBOM I contract, CDM Smith designed, constructed and operated the SRTTP as the first task order. Project highlights included:

- Design of a new 5-mgd WWTP comprising headworks and influent pump station, odor control, sequencing batch reactors, digesters, solids handling facilities, equalization and chlorine contact basins, chemical facilities, disk filters, effluent and reclaimed water pump stations, and 20+ miles of new pipeline for distribution of finished water.
- Received CWEA's 2015 "Southern Region Plant of the Year"

CDM Smith proposed a successful "best value" approach to the client to evaluate not only the initial SRTTP requirements, but also potential requirements for the future, recommending a backbone recycled water system for distribution of the SRTTP.

CDM Smith subsequently designed and constructed components to expand treatment capacity and modify the existing SRTTP facility to a 7.5-mgd capacity and to reliably produce effluent meeting California Code of Regulations Title 22, Division 4 criteria for disinfected tertiary recycled water.

CDM Smith also operated and maintained the SRTTP for 12 years, automating most of the routine activities and allowing for remote monitoring in order to keep operations to a single shift. The program also included extensive O&M training.

Greg Thomas, (former Facilities Maintenance Division – General Manager), now General Manager with Elsinore Valley Municipal Water District
T: (951) 674-3146
E: gthomas@evmwd.net

Project Dates: 2004 - 2020

Key Personnel: Chris Ott (Pump Station Designer), Sam Abi-Samra (Design Manager), Alan Hahn (Structural)

Under the leadership of CDM Smith, the SRTTP produced reclaimed water under a very stringent effluent requirement that included an instantaneous total nitrogen limit of 5 mg/L. The facility maintained a total nitrogen reportable average of 2.5 mg/L for over a year. This outstanding effluent was just one of the factors that resulted in the facility receiving the 2015 CWEA Southern Plant of the Year Award in the mid-size treatment plant category.

Naval Facilities Engineering Command, Southwest | Northern Regional Tertiary Treatment Plant (NRTTP) | Oceanside, CA

CDM Smith designed, constructed, and operated for 10 years the centrifuge dewatering system at NRTTP

CDM Smith designed and constructed a new WWTP to serve the northern half of Marine Corps Base (MCB) Camp Pendleton. The NRTTP was designed and constructed for a 4-mgd average annual daily flow rate and meets State of California Title 22 standards for Disinfected Tertiary Recycled Water. Some major elements included an influent pump station and headworks and grit removal facility, secondary biological treatment with nitrogen removal using sequencing batch reactors, advanced wastewater treatment, including flow equalization, filter influent pumping, and rapid sand filtration, chlorine disinfection, full odor control, chemical storage and handling, electrical, instrumentation and SCADA control systems, solids handling and disposal, effluent pumping and conveyance to existing percolation basins. The project also included three MWs of solar power generation to offset the new plant's power consumption to a net zero. This work had to be coordinated closely with a different project upgrading the primary power across the base as well as with SDG&E.

The project included the construction of a new tributary pump station to replace the aging sewage treatment plant, and 5 miles of 18-inch conveyance pipeline on the Basilone Road through the heart of Area 52 training town. This required construction with significant utility crossings, significant traffic control, and limited breeding periods for performance.

CDM Smith performed startup, commissioning and optimization, and operated the facility for nearly 10 years.

CDM Smith's O&M team brings firsthand experience with the continuous backwash filter technology (pictured here), to produce Title 22 recycled water under a San Diego RWQCB Permit.

Naval Facilities Engineering Command, Southwest,
Michael Stover, Supervisory Contract Specialist/Contracting Officer, Facilities Engineering and Acquisition Division,
T: (760) 725-8216
E: Michael.a.stover @navy.mil

Project Dates: 2011 - 2020

Key Personnel: Sam Abi-Samra (Design Manager), Chris Ott (Conveyance Task Lead), Carlos Melvin

Naval Facilities Engineering Command, Southwest |Recycled Water Distribution System | Oceanside, CA

Under the conveyance portion of the DBOM program, CDM Smith redesigned and constructed major wastewater and recycled water conveyance and storage facility improvements for the southern reaches of Marine Corps Base Camp Pendleton (MCBCP).

The project included construction of three tributary area pump stations (TAPS), seven reclaimed water pump stations (RWPS), and about 10 miles of wastewater and reclaimed water pipelines designed to convey sewage to the new SRTTP (via the TAPSs), and distribute the California Title 22 reclaimed water (via the RWPSs) to areas in the southern portion of the Base where the reclaimed water will be used for irrigation, a golf course, housing common areas, horse pasture, among other uses.

Flow from three decommissioned sewage treatment plants was redirected via three new sewage TAPS and wastewater transmission pipelines to the new SRTTP. Existing wastewater treatment operations were then consolidated at the new SRTTP. Through collaboration with stakeholders, the project team used value engineering concepts to expand project scope, while maintaining the same budget, to provide the recycled water (RW) system backbone for southern MCBCP. The recycled water distribution system now provides recycled water from the SRTTP to the Mainside, horse pasture, golf course, and front gate reuse areas. From this backbone system, the Base has the ability to store and distribute recycled water from a rehabilitated reservoir to serve additional reuse areas. This recycled water distribution system includes five pump stations and recycled water transmission pipelines. Rehabilitation of the existing Lemon Grove Impoundment Reservoir expanded existing capacity to 100 MG for emergency and seasonal storage.

Greg Thomas (former Facilities Maintenance Division – General Manager), now General Manager with Elsinore Valley Municipal Water District
T: (951) 674-3146
E: gthomas@evmwd.net

Project Dates: 2010 - 2014
Key Personnel: Abi-Samra (Design Manager), Chris Ott (Conveyance Task Lead)

Inland Empire Utilities Agency | Carbon Canyon Water Recycling Facility Asset Management and Improvement Project | Chino, CA

The Inland Empire Utilities Agency (IEUA) provides sewage treatment, solids waste handling, and recycled water throughout the west end of the San Bernardino county. IEUA operates five treatment facilities, including the Carbon Canyon Water Recycling Facility in Chino, which IEUA had planned to decommission. However, to have greater flexibility for providing recycled water, IEUA decided to keep the CCWRF in operation.

To keep the CCWRF in operation, improvements are needed to enhance reliability, and to simplify operation and maintenance. These activities will help IEUA continue to deliver recycled water at a reasonable cost to its customers. CDM Smith is working closely with IEUA on the CCWRF Asset Management and Improvements Project which will upgrade portions of the 12-mgd facility.

The project includes an evaluation of technologies and process improvements for the existing headworks. Improvements include screening technologies, washing of grit and screenings, and conveying the material for off-site removal; evaluation and design of odor control of the headworks and primary clarifier areas with low profile technologies that can be screened from view of nearby residences. In the secondary process, CDM Smith evaluated the current systems and recommended process improvements for the aeration basins, including aeration blower and diffuser equipment that will increase operational flexibility and improve treatment efficiency.

After reprioritization of the facility's needs, the project was optimized to focus on headworks screen replacement, odor control, and aeration blower replacement. The project, now entering the final design stage, will include provisions for sequencing construction to allow the facility to remain operational throughout the construction period, phasing in improvements and staging rehabilitation and process mechanical upgrades. The planned improvements were necessary to continue operations, meet regulatory requirements, improve the efficiency of materials handling, prevent impacts to nearby residents, and improve the overall operability of the plant.

The project is currently in final design, which will provide critical improvements needed to maintain treatment plant reliability and performance.

Inland Empire Utilities Agency, Adham Almasri, Senior Engineer
T: (909) 993-1462
E: aalmasri@iua.org

Project Dates: 2017 - Ongoing

Key Personnel: Tom Falk (Principal-in-Charge, Alan Hahn (Structural Lead)

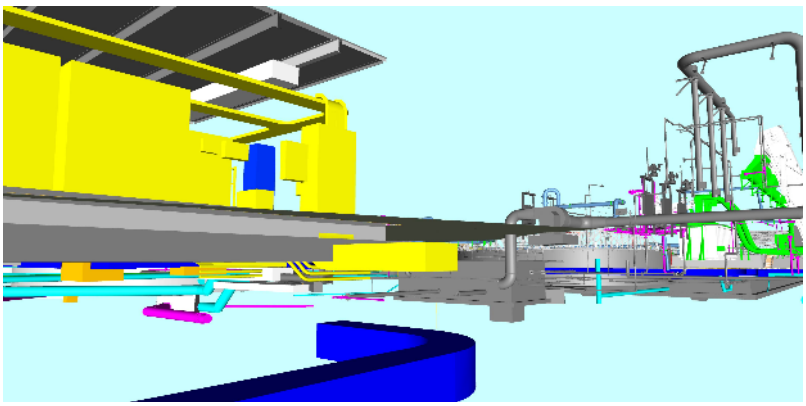
Inland Empire Utilities Agency | Regional Plant No. 5 (RP5) Expansion Project, Consulting Services | Chino, CA

The Inland Empire Utilities Agency (IEUA) retained CDM Smith under a focused, on-call contract and subsequent competitive contracts to provide consulting services on the $320 million RP-5 Project that will expand/upgrade the facility's capacity from the current 15-mgd conventional activated sludge to a 30-mgd membrane bioreactor and add a regional biosolids treatment and dewatering facility.

Design Support and Peer Review Services: CDM Smith provided extension of staff services to support IEUA's in-house project management team during the final design process. At 60% and 90% design stages, CDM Smith was tasked with conducting a comprehensive peer review of the full design package.

Constructability Review: At the 90% design stage, CDM Smith was retained to conduct a constructability review of the construction documents. This review process, led by Senior Construction Manager Matt Smith, included a weeklong, war-room style session with some of CDM Smith's most senior construction professionals, resulting in over 1,000 comments focused on contract risk management. The results of the constructability review were shared with IEUA and the design engineer in a multi-day, collaborative workshop setting.

O&M Transition Planning: CDM Smith is presently conducting a O&M assessment to advise on the future resource needs and staffing transitions for the expanded RP-5 facility. This work, led by John Gallegos, CDM Smith's regional O&M Practice Leader, included tours and interviews for comparable facilities to establish benchmarking criteria, extensive workshops with IEUA's staff, and a comprehensive review of IEUA's operating procedures and O&M costs. The final report will provide a roadmap for staffing levels, training requirements, and operating budgets over the phased, 5-year construction period and through the initial 5-year "burn-in" of the newly expanded plant.



CDM Smith's team used the 3d design model to assess constructability and construction sequencing challenges – shown here is an identified discrepancy with a large buried ductbank at one of the electrical buildings, in the midst of a congested utility corridor; resolving this issue prior to construction alleviated risk of a significant change order.

Inland Empire Utilities Agency, Jason Marseilles, Dep. Engineering Manager
T: 909-993-1823
E: jmarseilles@iua.org

Project Dates: 2018 - Ongoing

Key Personnel: Tom Falk (Principal-in-Charge, Matt Smith (Sr.CM), John Gallegos (O&M), Sam Abi-Samra (Peer Review Lead), Melissa Woo (Process Review)

Pump Station Experience

The planning, design, rehabilitation, permitting, and construction administration of major collection system and pump station projects has always been a core part of CDM Smith's business. We bring decades of experience working on new, renovated, expanded, and improvement projects for pump stations ranging in size from 1 mgd to 6,000 mgd. In the Western United States, CDM Smith has designed pump stations totaling more than 1,700 mgd in capacity.

The wide range of pump station sizes designed and constructed by CDM Smith provides CVWD with a comprehensive experience base has been incorporated into our in-house design guidelines for pumping facilities. These guidelines were originally produced by CDM Smith as a tool for our engineers, and over the years they have been revised to reflect improvements in our standard design approach and in available technologies. These guidelines are updated regularly based on user input, and they are used by our pump station design engineers as the foundation for every project.

CDM Smith Pump Station Experience

- SJWC - Saratoga WTP - 5 mgd
- Fort Irwin WTP and Dist. System - 6 mgd
- NAVFAC Camp Pendleton SRTTP PS - 8 mgd
- Leo J. Vander Lans AWTF - 8 mgd
- ACWD Newark Desal Facility - 10 mgd
- Livermore Springtown Water PS - 10 mgd
- SFPUC Harry Tracy WTP WWR PS - 10 mgd
- SCVWD Rinconada WTP RIP - 10 mgd
- SCVWD Santa Teresa WTP - 10 mgd
- JBLM WWTP - 12 mgd
- Redlands 1,750 Pressure Zone, Ford Park PS - 12 mgd
- Zone 7 Patterson Pass WTP Backwash PS - 12 mgd
- SFPUC Harry Tracy WTP BWS PS - 13 mgd
- Benicia Distribution System Improv. PS - 14 mgd
- Camp Pendleton SRTTP Influent PS - 15 mgd
- CCWD/Brentwood WTP RW PS - 15 mgd
- Miramar WTP - 22 mgd
- Zone 7 Patterson Pass WTP PS - 24 mgd
- San Bernardino Trunk Sewer Design - 25 mgd
- Stockton DWSP - 30 mgd
- Orange County Water District GWRS - 30 mgd
- Pittsburg WTP RW PS - 32 mgd
- Folsom WTP Expansions Settled & RW PS - 40 mgd
- Zone 7 Del Valle WTP RW PS - 44 mgd
- CCWD Bollman High Lift PS Improv. - 75 mgd
- Orange County Water District GWRS - 84 mgd
- SFPUC Harry Tracy WTP - 180 mgd
- Harahan PS to River, Lousiana - 776 mgd

Through our extensive pump station design experience in California alone, our team has learned how to maximize team performance, anticipate and resolve issues quickly, reduce life cycle costs, facilitate a smooth transition to the client, and meet even the most aggressive budgets and schedules.

Legend
○ Pump station design experience (#) indicates number of pump stations at facility

Santa Fe Irrigation District | San Dieguito Pump Station Replacement Project | Rancho Santa Fe, CA

CDM Smith designed the San Dieguito Pump Station replacement, which included assessment of an aging raw water forcemain, transient analysis, and design of new pumping facility with surge protection to protect the existing conveyance system.

CDM Smith conducted a hydraulic analysis of the raw water forcemain from the San Dieguito Pump Station at the base of the San Dieguito Dam up to the REB Plant. High pressures and transients were identified requiring a surge tank and operational limits to avoid compromising the nearly 50- year old pipeline.

The pump station draws raw from the San Dieguito Reservoir through an existing 24-inch intake. The intake, dating back to 1918, was rehabilitated as part of this project. The pump station was designed for 21-mgd ultimate flowrate and equipped with pumping units for firm capacity of 15 mgd. The facility is fully automated and integrated into the REB Plant, which is the discharge point for the raw water forcemain, with controls that maintain feed to the REB Plant. Electrical upgrades included a new service and standby emergency generator.

The pump station was designed to deliver up to 15 mgd and be expandable to 21 mgd. The project also included complete design of a new 480V electrical distribution system and a standby engine generator. It delivers water from the reservoir to the REB Plant through a 9,200-foot long, 30-inch diameter steel cylinder reinforced concrete pipe forcemain. Treated potable water is ultimately conveyed by gravity to over approximately 60,000 North San Diego County residents and businesses.

Santa Fe Irrigation District
Marissa Potter, Associate Civil Engineer
T: (858) 227-5792
E: mpotter@sfidwater.org

Project Dates: 2012 - 2018
Key Personnel: Tom Falk (Client Service Leader), Sam Abi-Samra (Project Manager), Chris Ott (Technical Advisor), Alan Hahn (Civil Engineer), Ronnie Chu (Structural)

Client References

Santa Fe Irrigation District - 5920 Linea del Cielo, Rancho Santa Fe, CA 92067

Projects:

- Washwater Tank Seismic Improvements and Clearwell Seismic Improvements
- Mechanical Dewatering and Dieguito Dam Improvements
- San Dieguito Pump Station Replacement Project

Contact: Marissa Potter, Associate Civil Engineer

T: (858) 227-5792
E: mpotter@sfidwater.org

Coachella Valley Water District - 51501 Tyler St, Coachella, CA 92236

Project:

- Sanitation Master Plan

Contact: Donn Wilcox, Project Manager

T: (760) 398-2651/2421
E: dwilcox@cvwd.org

Encina Wastewater Authority - 6200 Avenida Express, Carlsbad, CA 92011

Project:

- Implementation of Capital Improvement Program

Contact: Mike Steinlicht, General Manager

T: (760) 438-3941
E: steinlicht@encinajpa.com

6: Contract Comments

We have carefully reviewed San Elijo's contract language used in the sample agreement provided as Attachment A and respectfully request consideration of the following items:

- 13.01 – We request this clause be modified to provide a notice and opportunity to cure any breach before SEJPA may terminate the contract. Recommend at least 5 days for a cure period.
- 15.04 – Request this part be deleted. CDM Smith prefers that each party be responsible for their own attorneys' fees and costs of litigation – we find this discourages litigation; by deleting this paragraph, the contract would default to the American Rule which is CDM Smith's preference.
- Inclusion of a limit of liability, similar to the following:

  Limitation of Liability
  In no event shall ENGINEER's total liability to OWNER and/or any of the OWNER's officers, employees, agents, contractors or subcontractors for any and all injuries, claims, losses, expenses or damages whatsoever arising out of or in any way related to this agreement from cause or causes, including, but not limited to, ENGINEER's wrongful act, omission, negligence, errors, strict liability, breach of contract, breach of warranty, express or implied, exceed the total amount of fee paid to ENGINEER under this agreement or $50,000, whichever is greater.

- Inclusion of a mutual waiver of consequential damages, similar to the following

  Mutual Waiver of Consequential Damages
  Notwithstanding any other provision of this Agreement to the contrary, neither party including their officers, agents, servants and employees shall be liable to the other for lost profits or any special, indirect, incidental, or consequential damages in any way arising out of this Agreement however caused under a claim of any type or nature based on any theory of liability (including, but not limited to: contract, tort, or warranty) even if the possibility of such damages has been communicated.

7: Rate Schedule

CDM Smith Inc.

Hourly Rate Sheet for On Call Engineering Services to San Elijo Joint Powers Authority

January 2021 to December 2021

Engineers/Scientists/Planners		Support Services	
Grade 1	$105	Designer/Drafter 1	$100
Grade 2	$125	Designer/Drafter 2	$115
Grade 3	$150	Designer/Drafter 3	$130
Grade 4	$170	Designer/Drafter 4	$140
Grade 5	$197	Cost Estimator	$130 - $150
Grade 6	$212	Admin Asst / Word Processor	$100
Grade 7	$235	PM Assistant	
Grade 8 / Principal	$255		
Grade 9 / Associate, Vice President	$280		
Construction Support & Field Services		**SCADA/Construction Services**	
Construction Manager	$225	Programmer 1	$90
Resident Engineer	$150	Programmer 2	$100
Field Engineer	$120 - $150	Programmer 3	$110
Inspector – General	$105 - $140		
Inspector – Special*	$120 - $175		

Other Costs

- Outside professionals, contractors, and consultants will be billed at cost + 10%.
- Expert witness rates will be charged at 2x standard rates.
- Rates will be held for initial 12 months and increased by 3% for second contract year; task order fees will reflect rate structure associated with anticipated period of service.
- Other direct costs (e.g., printing, mileage) will be billed at cost + 5%.

Appendix
Resumes

Thomas C. Falk, PE, PMP

Contract / Project Manager

Mr. Falk has nearly 20 years of experience delivering water, sewer and recycled water infrastructure projects throughout California, spanning the entire asset life cycle. As CDM Smith's local Client Service Leader, Mr. Falk is responsible for assembling and leading teams to deliver an unparalleled client experience.

Project Manager, Water Reclamation Plant No. 7 Biosolids Upgrades Project, Coachella Valley Water District, Coachella, California. Mr. Falk managed the upgrade project for this 5-mgd water reclamation facility that replaced an aging solids handling facility. A thorough life cycle cost analysis of leading dewatering equipment was performed, including belt presses, screw presses and centrifuges, including extensive pilot testing of candidate technologies, selecting centrifuges as the preferred, lowest cost dewatering technology.

Project Manager, San Elijo Water Reclamation Facility (SEWRF) Headworks Improvements, an Elijo Joint Powers Authority, San Elijo, California. Mr. Falk managed the preliminary design of upgrades and rehabilitation to the 5-mgd SEWRF headworks, screening handling, and odor control. The project, now constructed, rehabilitated and expanded the structures replaced aging equipment.

Project Manager, Emergency Power Project, San Elijo Joint Powers Authority, Cardiff, California. Mr. Falk managed the design of the Emergency Power Project that demolished two standby generators that had reached the end of their useful life, and installed a single 800 kW generator to backfeed the dual plant utility services.

Project Manager, Process Evaluation and Capital Improvement Plan, Olivenhain Municipal Water District, Encinitas, California. Mr. Falk managed a comprehensive wastewater system process evaluation, condition assessment, and failure mode and effects analysis of the 4S Ranch WRF, 4S Ranch and Rancho Cielo Collection Systems. The results of the studies defined a 20-year capital improvement program totaling $40 million.

Project Manager, Sanitation Master Plan Update, Coachella Valley Water District, Coachella, California. Mr. Falk managed the Sanitation Master Plan Update, a comprehensive evaluation of the District's collection system (1,100 miles of pipe and 27 pump stations) and five water reclamation plants (permitted capacity of 33 mgd). The total, 20-year CIP is valued at just over $600 million.

Project Engineer / Resident Engineer, Coachella Wastewater Treatment Plant Expansion, Coachella, California. Mr. Falk was the lead project engineer and full-time on-site resident engineer during construction for the 3-mgd expansion of the secondary treatment plant, 1.5 miles of influent trunk sewer ranging in size from 42-inch to 54-inch diameter and a 3,000-square-foot administration and control building.

Project Manager, Primary Area Upgrades Project, Encina Wastewater Authority, Carlsbad, California. Mr. Falk is the project manager for the upgrades, rehabilitation, and improvements to 40.5 mgd headworks and primary treatment systems. The project, now in construction, replaces climber screens with multi-rake screens and constructs a new grit and screening handling building adjacent to the existing headworks, replaces 36 slide

Education

BS Civil Engineering – *Cum Laude,* San Diego State University

Registration

Professional Civil Engineer: California

Certifications

PMP ® No. 2873577

and sluice gates, channel and tank coatings, and replacement of motor control centers, control and power wiring, and control system for the entire primary process area.

Client Service Leader, Carbon Canyon Water Reclamation Facility Critical Upgrades, Inland Empire Utilities Agency, Chino, California. Mr. Falk is leading the design of critical upgrades to the 11.4 mgd water reclamation facility that will replace bar screens at the headworks, provide a new 23,000 cfm biotrickling filter/carbon polishing system, and upgrade the aeration system with new high-speed turbo-style blowersand refurbish the tertiary filtration process.

Client Service Leader, RP-5 Constructability Review, Peer Review, and O&M Study, Inland Empire Utilities Agency, Chino, California. Mr. Falk led team(s) of construction managers, engineers, and operators under on-call contracts to support IEUA on the $320 million RP-5 Expansion Project. The RP-5 project will expand the liquid treatment from 15 mgd to 30 mgd by retrofitting to a membrane bioreactor (MBR) and add a new 40-mgd equivlanet biosolids treatment facility consisting of 2-stage digestion, co-thickening with rotary drum thickeners, and centrifuge dewatering.

Principal Construction Manager, Mechanical Dewatering Uprades and San Dieguito Dam Rehabilitation and Clearwell/Washwater Tank Seismic Retrofit, Santa Fe Irrigation District, Rancho Santa Fe, California. Mr. Falk is overseeing a full-time construction management and inspection team(s) for upgrades at the 40 mgd RE Badger Water Filtration Plant and the 100-year old San Dieguito Dam. Mr. Falk is responsible for field team oversight, resourcing, project management, and implementation of a custom-built document control system using eBuilder.

Technical Advisor, On-Call Engineering, Encina Wastewater Authority, Carlsbad, California. Mr. Falk was responsible for oversight and quality assurance of various upgrades to the Encina Water Pollution Control Facility (45-mgd capacity) under an as-needed contract including the following task-order assignments: rehabilitation of four 110-ft diameter secondary clarifiers; a comprehensive plant water use/efficiency study; plant safety assessments and corrections; replacement of primary sedimentation tank covers; condition assessment and rehabitliation plans for failing influent sewer pipes; and design of miscellaneous plant chemical and odor control improvements.

Contract/Project Manager, As-Needed Engineering Contract, City of Corona, California. Mr. Falk was the as-needed contract/project manager for a multi-year oncall contract underwhich he led the following task order assignments:conducted a comprehensive solids management and dewatering study including an inter-process sampling program for a calibrated mass-balance, investigated struvite formation, reviewed pilot testing data and prepared preliminary design for centrifuge retrofit; designed headworks upgrades at the City's WRF1 (11.5-mgd capacity); designed headworks upgrades at the City' s WRF2 (3-mgd capacity); and miscellaneous plant electrical upgrades.

Contract/Project Manager, As-Needed Engineering Contract, City of Riverside, California. Mr. Falk is the as-needed contract/project manager for a 3-year on-call contract under which he led a team to assess a poorly performing pump station, conduct system stress testing, and identify and implement pump control program modifications.

Sam Abi-Samra, PE, BCEE, PMP

QA/QC

With more than 40 years of professional engineering experience Mr. Abi-Samra brings extensive expertise in managing large projects and programs and leveraging the right resources through large multidisciplinary teams. He is an experienced project manager with an extensive resume of multimillion-dollar design projects for which he has successfully led large teams. Many of the projects on which Mr. Abi-Samra served in a leadership role have won prestigious national and international awards.

Design Manager, Naval Facility Engineering Command/ MCB Camp Pendleton, Design-Build of the Southern Regional Tertiary Treatment Plant (SRTTP), Camp Pendleton, California. Mr. Abi-Samra was responsible for overseeing the design of this tertiary treatment plant, which includes a 15 mgd influent pump station mechanical bar screens and vortex grit collectors for preliminary treatment. It also includes sequencing batch reactors for secondary treatment and nutrient removal. The tertiary stage consists of disk filters and disinfection with on-site generation of hypochlorite. Sludge dewatering handling included aerobic digestion, thickening and dewatering. The facility also included a boiler for odor control. The plant will treat 5 million gallons per day (mgd) of wastewater at average conditions and 15 mgd at peak wet weather flows. It will be capable of full reclamation without discharging to a receiving body of water. The effluent from the plant will comply with California Title 22 regulations for reclaimed water. The plant will also achieve best available technology for nutrient removal of phosphorous and nitrogen. The layout is based on a modular design that allows for fluctuation in flow and for future expansion.

Project Manager, San Dieguito Raw Water Pump Station, Santa Fe Irrigation District, California. Mr. Abi-Samra is managing the construction-phase engineering services for the 15-mgd San Dieguito raw water intake and pump station at the San Dieguito Dam. The project also includes the rehabilitation of two existing raw water intakes through a dam constructed in 1918.

Design Manager, San Luis Rey Water Reclamation Facility Expansion & Recycled Water Reservoir, City of Oceanside, California. Mr. Abi-Samra was responsible for design of the 3-mgd tertiary treatment plant expansion to the San Luis Rey Water Reclamation Facility (WRF) and 2 MG, AWWA D110, Type 1 pre-stressed concrete reservoir and recycled water pump station.

Manager of Engineering Support During Construction, City of Los Angeles Department of Public Works Bureau of Sanitation, Hyperion Treatment Plant, Playa del Rey, California. Mr. Abi-Samra was responsible for several projects for the City of Los Angeles Hyperion Treatment Plant Full Secondary Program. Under this project he managed several subconsultants and a team of 50 professionals. His responsibilities included preparation of change orders, responding to requests for information (RFIs) and interpretation of contract documents, obtaining construction permits, checking of shop documents, review and analysis of claims, maintaining up-to-date marked set of drawings based on data provided by the contractor, and document control and maintenance. The projects included the headworks and service facilities ($80M), secondary facilities

Education

MS - Civil Engineering, University of Kansas, 1981

BS - Civil Engineering, University of MO Columbia, 1978

Registration

Professional Engineer – Civil: California and Kansas

Certifications

Certified Project Management Professional (PMP), Project Management Institute

($190M), waste activated sludge facilities ($67M), D Street utilities ($10M), and the digester expansion ($167M).

Project Manager, City of Los Angeles Department of Public Works Bureau of Engineering, Primary Battery Modernization at Hyperion Wastewater Treatment Plant, Playa del Rey, California. Mr. Abi-Samra oversaw the design of the primary treatment system rehabilitation that included the following: addition of new primary clarifiers; replacement of existing sludge pumps, compressor, and blower equipment; new influent and effluent channel arrangements; new sludge and scum collection and removal equipment; sub-division of existing primary tanks into smaller tanks to facilitate dewatering and maintenance procedures; and replacement of the top slab on the existing primary batteries with a new slab to restore the structural integrity of the facility.

Project Manager, Orange County Sanitation District, Design of Wastewater Treatment Plant (WWTP) Odor Control Facilities, Plant 1, Fountain Valley, California. Mr. Abi-Samra was responsible for managing this odor control project, which includes a two-staged odor control system consisting of a first-of-its-kind first-stage biological treatment scrubbers followed by second-stage chemical scrubbers. Part of the project involved field measurements of odor levels in and around the plant to identify odor sources and quantify odor levels. It also includes new ductwork, new instrumentation and control systems, new electrical facilities and two new power buildings. The project also included a comprehensive odor modeling effort for both of the District s WWTPs, which have a combined wastewater flow of approximately 240 mgd. The estimated construction cost of the project, which treats over 230,000 cfm, is $30 million.

Project Director, Orange County Sanitation District, Design of WWTP Odor Control, Plant 2, Huntington Beach, California. Mr. Abi-Samra was responsible for overseeing the design of the odor control facility for the primary treatment at Orange County Sanitation District's Plant No. 2 to treat approximately 130,000 cfm of foul air with two stages: a first-of-its-kind first-stage biological treatment followed by second-stage chemical scrubbers.

Principal-in-Charge, Pala Casino Wastewater Treatment Plant Design-Build. Mr. Abi-Samra served as principal-in-charge and process design lead for a tertiary treatment plant with 0.6 mgd capacity, expandable to 1.2 mgd. The facility to included screening, two sequential batch reactor tanks, equalization tank, aerobic digester, tertiary filter, chlorine contact basin and belt filter press for sludge dewatering. The plant will produce recycled water for water re-use and has percolation ponds to percolate the effluent for groundwater recharge.

Design Manager. Oak Lodge Sanitary District, Design-Build of Outfalls, Milwaukie, Oregon. Mr. Abi-Samra was responsible for managing the design of two 36-inch plant outfalls for the Oak Lodge Sanitary District, extending several hundred feet into the Willamette River with diffuser to eliminate toxicity of effluent.

Judy K. Nishimoto, PE

Task Leader

Ms. Nishimoto has over 20 years of experience in CDM Smith's municipal water and wastewater group and has led the technical delivery of multidisciplinary teams in the design and support of construction of multi-million-dollar facilities. Her project experience includes master planning and design of water and wastewater treatment plants (plant hydraulics, process controls and monitoring, pump stations, storage and disinfection, chemical feed systems, ultrafiltration membranes) and water distribution and wastewater collection systems improvements (pipe rehabilitation and replacement, trenchless construction, force mains, line extensions, drainage and grading, roadway pavement replacement, and permitting).

Project Manager, Sanitation Master Plan Update, Coachella Valley Water District, Palm Desert, California. Ms. Nishimoto is managing the $1.4M planning effort to develop the Capital Improvement Program (CIP) for the next 20 years. The work includes population growth, average and peak flow projections apportioned within the collection system based on land use planning, water reclamation plant flow and loading projections, hydraulic evaluation, process performance and capacity evaluations, a strategy for maintaining regulatory compliance, developing CIP from asset management information for the WRPs, collection system and pump stations, updating the biosolids management plan and developing conceptual improvements at their five Water Reclamation Plants. A benchmarking and chemical/energy audit, and an automation evaluation was conducted on the treatment facilities to identify other gaps and opportunities for lowering operating and maintenance costs. The ambitious vision to achieve its "Sanitation Facilities of the Future" required leveraging technology and automation to reduce O&M cost, increasing water reuse, and incorporating asset management to optimize infrastructure investment. Judy helped facilitate iterations and refinement throughout the planning process and the ultimate outcome is a Master Plan for the next 20 years that is scheduled according to the District's priorities and goals, is affordable, and will ensure their ability to continue to provide cost-effective service to their customers. Ms. Nishimoto is currently developing the CIP program costs and schedule and overseeing the development of the Environmental Impact Report for the project.

Process Lead, Annacis Wastewater Treatment Plant Stage V Expansion Project, Vancouver British Columbia. Ms. Nishimoto worked as extended staff for Metro Vancouver in their project delivery section on the $550M Stage V Expansion Project. The Annacis WWTP receives wastewater from 14 municipalities and over 1 million residents. The project expands the primary and secondary treatment process by 60%. This significant expansion impacts the headworks, influent pumping system, trickling filters, primary sedimentation tanks, solid contact tanks, secondary clarifier tanks, thickeners and centrifuges. Ms. Nishimoto's duties include oversight and review of the design consultants work, resolution of the plant hydraulics, RSS pumping system, review of the current plant processes and controls, communications with operations to review optimization of plant performance, and finalizing of the process programming. Judy was responsible for resolving the flow split issues they have in their secondary process. She worked with a consultant on CFD analysis that resulted design changes to put measures in key locations

Education

MS – Environmental Engineering, Northeastern University, 2000

BS – Civil Engineering, Brigham Young University, 1997

Registration

Professional Engineer: Pennsylvania, Washington, Hawaii, California (pending)

to mitigate against risks of high velocity potential, uneven settlement, and unpredictable hydraulics due to submerged weirs. She was also asked to review the consultant's design for the RSS pumping system and work with plant Operations to review performance and optimization of plant processes. Judy led and conducted a field study of the RSS pumps to confirm that erosion of the impeller had significantly altered the pump curve. She also did extensive modeling to develop an SOP that maintains the current programming of the pumps at various hydraulic scenarios.

Lead Process Engineer, Department of the Army, Corps of Engineers FY13 Wastewater Treatment Plant, PN 75165, Joint Base Lewis McChord, Washington. Ms. Nishimoto was responsible for the startup and testing of a 12 mgd tertiary membrane filtration system at the new wastewater treatment plant at Joint Base Lewis McChord (JBLM). The system is sized to achieve net zero water quality impacts. JBLM, however, can see the population fluctuate dramatically throughout the year. The wastewater flow then can go from 0.9 mgd to 12 mgd peak hour flow. Ms. Nishimoto developed a startup and testing plan that could fully prove out the performance (acceptance testing) of the tertiary membrane filtration system within 30 days, at the current extreme low flow conditions. She also presented a strategy for long-term reliable operations and storage of non-utilized filtration skids.

Process Lead, River Road Sanitary Sewer Overflow Wet Weather Treatment Facility, Salem, Oregon. The City of Salem, Oregon experienced high levels of infiltration during peak storms. These events occurred 6 to 12 times per year and resulted in a release of untreated sanitary flows to the Willamette River. The city undertook a cutting edge project to utilize a standalone high rate clarification with ultraviolet disinfection process to treat sanitary sewer overflows (SSOs) at the River Road Park, the first facility of this type in the country. The treatment plant has a rated capacity of 50-mgd of dilute raw sewage. CDM Smith was selected by the City of Salem to complete the process mechanical, electrical, and instrumentation and control design of the new facilities. Ms. Nishimoto was the process lead and prepared the hydraulic grade line through the facility, process flow diagram, and the design plans and specifications of the plant flow metering, chemical feed system, screening system, pump station, high rate clarification tanks, and UV channels. The drawings were prepared using 3D design techniques to implement an efficient design and provide the city with a living product that can be used for training, operations, and maintenance.

Michael Hill, PE

Project Engineer

Mr. Hill is an environmental engineer specialized in water treatment projects and experienced in all phases of engineering from planning, design, and construction. Mr. Hill is a strong civil/mechanical systems designer and possesses expertise in facility hydraulics, pumping systems, chemical feed facilities, and control systems. He is responsible for detailed design and layout, civil/mechanical calculations and analysis, equipment selection, functional loop descriptions, cost estimation, and development of plans and specifications. Mr. Hill is also experienced in construction inspection and other engineering services during the construction phase.

Education

BS – Civil Engineering, San Diego State University, 2009

Registration

Professional Engineer: California, Washington

Lead Engineer and Engineer of Record, San Elijo Water Reclamation Facility Preliminary Treatment Upgrades, San Elijo Joint Powers Authority, Cardiff by the Sea, California. Mr. Hill served as the lead engineer and engineer of record for the preliminary and final design of the 5.25 mgd headworks upgrade. The project consisted of constructing new headworks screenings channels with higher hydraulic capacity just north of existing Headworks. The existing Headworks channels will remain in operation during construction to reduce bypassing costs. New screenings equipment includes duty/standby 6mm step screens, sluiceway, and duty/standby wash presses. Odor control improvements construction of new foul air ducting, rebalancing of existing ducting to optimize odor control, and installation of chemical dosing pumps for existing scrubber.

Project Engineer, San Elijo Water Reclamation Facility Emergency Power Project, San Elijo Joint Powers Authority, Cardiff, California. Mr. Hill was the project engineer for the Emergency Power Project at San Elijo Water Reclamation Facility (SEWRF). He prepared plans and specifications in coordination with electrical subconsultant for the installation of a new outdoor 800 kW generator and prepared design for grading, paving, foundation slab, and rehabilitation/repurposing of the abandoned generator rooms.

Project Engineer, Coachella Valley Water Reclamation Plant No. 7 Biosolids Upgrades Project, Coachella Valley Water District, California. Mr. Hill served as the project engineer for the project, which involved design of new solids handling facility, complete with sludge holding tank, odor control, new truck scales, polymer storage and feed pumps, and solids thickening/dewatering and conveyance facilities. Mr. Hill performed all hydraulic calculations of the waste activated sludge pump station, thickened sludge pump station, and drainage pump station and performed the design of foul air ducting system. He also prepared the centrifuge performance proofing protocol and worked closely and performed inspections of the reliability acceptance testing.

Assistant Project Manager and Engineer of Record, 4S Ranch WRF Filter Rehabilitation, Olivenhain Municipal Water District, San Diego, California. Mr. Hill served as the assistant project manager and engineer of record for the rehabilitation design of the existing 2.0 mgd pulse bed sand filters. The project consisted of replacing filter media, valves, and air piping, recoating the tanks, and providing temporary/rental filter equipment during construction.

Lead Engineer, Woods Valley Ranch WRF Phase 2, Valley Center Municipal Water District, Valley Center, California. Mr. Hill served as the lead engineer for the project

which expands the WRF capacity of the existing facilities to 0.275 mgd. He designed new influent pump station, raw screenings facilities, influent equalization, biological nutrient removal wastewater treatment process (pre-selected, negotiated Aero-Mod process) and tertiary filtration (cloth disk filters), 24-hour off-spec water storage, upgrade to the disinfection systems, and recycled water pump station. Careful planning and construction staging and sequencing were considered to fit the facilities on the 1 acre site. Mr. Hill and the CDM Smith conducted process selection and civil/mechanical systems that were carefully arranged to fit within constraints of the existing hydraulic profile and height limitations for process tanks. The extensive soil remediation requirements and site constraints required the use of vertical shoring. Mr. Hill also served as project manager for construction phase engineering services.

Project Engineer, Wastewater Treatment Plant Improvement Project, City of Guadalupe, California. Mr. Hill served as the project engineer for the plant improvements, which involve renovating the existing headworks and influent pump station, converting the existing advanced integrated pond system (AIPS) to an activated sludge process utilizing Biolac®, and constructing a new sludge handling facility. Other improvements consisted of grit equipment upgrades, installation of mechanical bar screens, and rehabilitation of the influent pump station.

Lead Engineer, Water Reclamation Facility 2 Tertiary Treatment Project, City of Corona, Corona, California. Mr. Hill served as the lead engineer for the 4.0 mgd tertiary treatment project, which included dual-media gravity filters with concurrent air scour backwash, 24 motor actuated valves, filter feed pump station, backwash supply storage tank and pump station, backwash waste equalization tank and pump station, and chemical feed facility. He prepared plans and specifications for project which was constructed with a change order rate of 1%. Mr. Hill also prepared construction cost estimate and all hydraulic calculations.

Lead Engineer, WRF Capacity Evaluation, Rincon del Diablo Municipal Water District, Escondido, California. Mr. Hill served as lead engineer for the project and was responsible for process calculations to evaluate the capacity of the existing WRF and determining the necessary improvements to accommodate the proposed community developments. Additional influent equalization tanks, aeration basins, clarifiers, digesters, and effluent pumps were determined to be necessary to accommodate the planned higher flow rates. Mr. Hill prepared conceptual layout, alternative analysis, and cost estimates.

Project Engineer, Carpinteria Wastewater Treatment Plant Optimization, Carpinteria Sanitary District, Carpineteria, California. Mr. Hill was the project engineer for energy audit, which identified multiple energy efficiency measures including installing high speed turbo blowers, modulating valves at each zone of the aeration basins, and dissolved oxygen control, and ammonia based aeration control. He provided technical assistance and oversight to project engineers calculating the aeration demand using BioWin treatment process simulation software and selected a blower configuration to meet future demands and improve turndown during low flow periods.

Christian Sanders

Recycled Water Membrane Specialist

Mr. Sanders in a senior environmental engineer with experience spanning the Americas and Australia/ New Zealand in the areas of process design development (seawater desalination, recycled water and conventional surface/groundwater treatment), treatment plant commissioning, large-scale pilot plant testing (desalination and fresh water), bench-scale testing, and implementation of operational optimization programs.

Design/Commissioning Lead, Desalination Plant Design-Build for the Monterey Peninsula Water Supply Project, California American Water, Monterey, California. Mr. Sanders is one of the lead process engineers developing the 8.0 mgd MPWSP, which will be the second largest desalination plant in California upon its completion, which is being constructed to resolve the region's water supply crisis. The design-build project includes beach wells, granular media for metals oxidation/removal, two pass RO, UV disinfection, and full post-treatment to produce drinking water with boron levels less than 0.5 mg/L. Mr. Sanders will eventually lead the commissioning effort during construction, which includes achieving 30-days of stringent acceptance testing requirements related to power consumption and final water quality.

Commissioning Manager, Ft. Irwin New Water Treatment Plant Design-Build, U.S. Army Corps of Engineers – Los Angeles District, National Training Center, Fort Irwin, California. As commissioning manager on this design-build project, which delivered the 6 mgd water treatment plant (WTP), one of the largest zero liquid discharge plants of its kind, Mr. Sanders was onsite for nearly one year directing the commissioning and startup activities, which included a 90-day performance proving period. The novel plant design incorporated a complex treatment process including electrodialysis reversal (EDR), enhanced lime softening, close-coupled MF/RO, ion exchange (IX), and mechanical evaporation to reliably achieve greater than 99% recovery of its groundwater sources.

Commissioning Lead, Potable Water Treatment/Blending Facility Design-Build, Naval Facilities Engineering Command (NAVFAC) Southwest, Twentynine Palms, California. This new $49 million WTP will provide 3 mgd of treated groundwater to the remote Marine Corps Air Ground Combat Center located in the Mojave Desert. Treatment includes two stage RO followed by closed circuit desalination of the RO brine to achieve an overall recovery of 94% or greater. Mr. Sanders is currently preparing the planning documentation (schedule, resources, budget) for the commissioning effort, providing technical review of design drawings/documentation and providing final QA/QC oversight of submittal and RFI responses to ensure compliance with the design-build contract.

Commissioning Lead, Pojoaque Basin Regional Water System Design-Build, U.S. Department of Interior, Bureau of Reclamation, New Mexico. Mr. Sanders is the commissioning lead on the 3.5 mgd WTP, which will treat water from the Rio Grande using ultrafiltration followed by nanofiltration to achieve 90% overall recovery while maintaining Total Organic Carbon (TOC) less than 0.9 mg/L for disinfection byproduct minimization of the potable water. During design, Mr. Sanders participated on the technical review committee as a process expert, reviewing and marking up drawings and design documentation, preparing the draft O&M manual, and participating on value engineering

Education

MPS – Agriculture and Life Sciences, Cornell University, 2005

BS – Environmental Engineering, University of Florida, 2000

Certifications

MIEAust CPEng (Environmental) **Professional Engineer (Australia)*

IntPE(Aus)

APEC Engineer

workshops. He is currently involved in the planning of commissioning activities, including development of a preliminary commissioning schedule and required resources including staff, trade labor, chemicals and equipment.

Technical Advisor, Water Recycling Facility Design-Build, City of Carlsbad, California. Mr. Sanders provided technical and commissioning leadership during the final commissioning phase for the 3.38 mgd reuse project, which included a 60-day performance testing period. The plant utilizes ultrafiltration with downstream chlorine disinfection to treat secondary treated wastewater for water reuse applications.

Senior Process Engineer, South East Recycled Water Alliance, Mornington (Australia). On this alternative delivery project, Mr. Sanders acted as the alliance's commissioning manager, overseeing the startup and performance testing of the three advanced water recycling facilities (0.6, 1,0, and 6.9 mgd capacity) that incorporated several technologies, including ultrafiltration, UV treatment, and reverse osmosis. In this capacity, Mr. Sanders prepared schedules to coordinate testing activities, carried out testing on the various unit processes, performed troubleshooting on equipment, analyzed raw data to verify equipment/ process performance, and operated the facilities throughout their performance proving period, which involved supervising vendors, sub-contractors, junior engineers, and the client's operations staff.

Senior Process Engineer, Douglas Water Treatment Plant, Townsville (Australia). Mr. Sanders provided onsite process optimization and design support aimed at improving the operation of one of the facility's 24 mgd granular media filter trains as well as the wastewater/sludge handling system at the Douglas WTP.

Senior Process Engineer, Nebo Road Water Treatment Plant, Mackay (Australia). Mr. Sanders provided several weeks of onsite operations support and treatment optimization for this 20 mgd facility. Project work included significant involvement in process troubleshooting and performance improvement of the plant's recently commissioned sludge handling/dewatering system, including new sludge thickener and centrifuges.

Senior Process Engineer, Douglas Water Treatment Plant, Townsville (Australia). Mr. Sanders provided several weeks of on-site commissioning support and supervised the optimization of the plant's 15.5 mgd granular media filter trains, including the 10-day performance trial. He was also responsible for producing the Acceptance Test Report.

Senior Process Engineer, Bundamba Advanced Water Treatment Plant, Brisbane (Australia). Mr. Sanders provided three months of on-site process support for one of the city's three water recycling facilities including troubleshooting, optimization of lime dosing system, plant instrumentation, chemical dosing pumps, and biological nutrient removal.

Senior Process Engineer, Owner's Engineer – Design and Construct of Huonville Water Treatment Plant, Tasmania (Australia). Mr. Sanders prepared a concept design and technical specification for a proposed 2.4 mgd DAFF WTP. He assisted in the tender review phase as the owner's process consultant and served as the owner's representative for the commissioning and performance testing phase of the project.

Christian Sanders

Recycled Water Membrane Specialist

Mr. Sanders in a senior environmental engineer with experience spanning the Americas and Australia/ New Zealand in the areas of process design development (seawater desalination, recycled water and conventional surface/groundwater treatment), treatment plant commissioning, large-scale pilot plant testing (desalination and fresh water), bench-scale testing, and implementation of operational optimization programs.

Design/Commissioning Lead, Desalination Plant Design-Build for the Monterey Peninsula Water Supply Project, California American Water, Monterey, California. Mr. Sanders is one of the lead process engineers developing the 8.0 mgd MPWSP, which will be the second largest desalination plant in California upon its completion, which is being constructed to resolve the region's water supply crisis. The design-build project includes beach wells, granular media for metals oxidation/removal, two pass RO, UV disinfection, and full post-treatment to produce drinking water with boron levels less than 0.5 mg/L. Mr. Sanders will eventually lead the commissioning effort during construction, which includes achieving 30-days of stringent acceptance testing requirements related to power consumption and final water quality.

Commissioning Manager, Ft. Irwin New Water Treatment Plant Design-Build, U.S. Army Corps of Engineers – Los Angeles District, National Training Center, Fort Irwin, California. As commissioning manager on this design-build project, which delivered the 6 mgd water treatment plant (WTP), one of the largest zero liquid discharge plants of its kind, Mr. Sanders was onsite for nearly one year directing the commissioning and startup activities, which included a 90-day performance proving period. The novel plant design incorporated a complex treatment process including electrodialysis reversal (EDR), enhanced lime softening, close-coupled MF/RO, ion exchange (IX), and mechanical evaporation to reliably achieve greater than 99% recovery of its groundwater sources.

Commissioning Lead, Potable Water Treatment/Blending Facility Design-Build, Naval Facilities Engineering Command (NAVFAC) Southwest, Twentynine Palms, California. This new $49 million WTP will provide 3 mgd of treated groundwater to the remote Marine Corps Air Ground Combat Center located in the Mojave Desert. Treatment includes two stage RO followed by closed circuit desalination of the RO brine to achieve an overall recovery of 94% or greater. Mr. Sanders is currently preparing the planning documentation (schedule, resources, budget) for the commissioning effort, providing technical review of design drawings/documentation and providing final QA/QC oversight of submittal and RFI responses to ensure compliance with the design-build contract.

Commissioning Lead, Pojoaque Basin Regional Water System Design-Build, U.S. Department of Interior, Bureau of Reclamation, New Mexico. Mr. Sanders is the commissioning lead on the 3.5 mgd WTP, which will treat water from the Rio Grande using ultrafiltration followed by nanofiltration to achieve 90% overall recovery while maintaining Total Organic Carbon (TOC) less than 0.9 mg/L for disinfection byproduct minimization of the potable water. During design, Mr. Sanders participated on the technical review committee as a process expert, reviewing and marking up drawings and design documentation, preparing the draft O&M manual, and participating on value engineering

Education

MPS – Agriculture and Life Sciences, Cornell University, 2005

BS – Environmental Engineering, University of Florida, 2000

Certifications

MIEAust CPEng (Environmental) **Professional Engineer (Australia)*

IntPE(Aus)

APEC Engineer

workshops. He is currently involved in the planning of commissioning activities, including development of a preliminary commissioning schedule and required resources including staff, trade labor, chemicals and equipment.

Technical Advisor, Water Recycling Facility Design-Build, City of Carlsbad, California. Mr. Sanders provided technical and commissioning leadership during the final commissioning phase for the 3.38 mgd reuse project, which included a 60-day performance testing period. The plant utilizes ultrafiltration with downstream chlorine disinfection to treat secondary treated wastewater for water reuse applications.

Senior Process Engineer, South East Recycled Water Alliance, Mornington (Australia). On this alternative delivery project, Mr. Sanders acted as the alliance's commissioning manager, overseeing the startup and performance testing of the three advanced water recycling facilities (0.6, 1,0, and 6.9 mgd capacity) that incorporated several technologies, including ultrafiltration, UV treatment, and reverse osmosis. In this capacity, Mr. Sanders prepared schedules to coordinate testing activities, carried out testing on the various unit processes, performed troubleshooting on equipment, analyzed raw data to verify equipment/ process performance, and operated the facilities throughout their performance proving period, which involved supervising vendors, sub-contractors, junior engineers, and the client's operations staff.

Senior Process Engineer, Douglas Water Treatment Plant, Townsville (Australia). Mr. Sanders provided onsite process optimization and design support aimed at improving the operation of one of the facility's 24 mgd granular media filter trains as well as the wastewater/sludge handling system at the Douglas WTP.

Senior Process Engineer, Nebo Road Water Treatment Plant, Mackay (Australia). Mr. Sanders provided several weeks of onsite operations support and treatment optimization for this 20 mgd facility. Project work included significant involvement in process troubleshooting and performance improvement of the plant's recently commissioned sludge handling/dewatering system, including new sludge thickener and centrifuges.

Senior Process Engineer, Douglas Water Treatment Plant, Townsville (Australia). Mr. Sanders provided several weeks of on-site commissioning support and supervised the optimization of the plant's 15.5 mgd granular media filter trains, including the 10-day performance trial. He was also responsible for producing the Acceptance Test Report.

Senior Process Engineer, Bundamba Advanced Water Treatment Plant, Brisbane (Australia). Mr. Sanders provided three months of on-site process support for one of the city's three water recycling facilities including troubleshooting, optimization of lime dosing system, plant instrumentation, chemical dosing pumps, and biological nutrient removal.

Senior Process Engineer, Owner's Engineer – Design and Construct of Huonville Water Treatment Plant, Tasmania (Australia). Mr. Sanders prepared a concept design and technical specification for a proposed 2.4 mgd DAFF WTP. He assisted in the tender review phase as the owner's process consultant and served as the owner's representative for the commissioning and performance testing phase of the project.

Christopher A. Ott, PE

Hydraulics, Pumps, Modeling

Mr. Ott is a civil/environmental engineer with more than 17 years of experience specializing in the planning and design of water and wastewater conveyance systems. He also has extensive experience managing the technical design of large multidisciplinary water and wastewater infrastructure design projects and he has demonstrated expertise in pumping and pressure hydraulic systems.

Conveyance Design Project Manager, Northern Regional Tertiary Treatment System (NRTTP) and Southern Regional Tertiary Treatment System (SRTTP) (P-1041/P-1043) Wastewater Systems, Naval Facilities Engineering Command (NAVFAC) Southwest, Marine Corps Base Camp Pendleton, Oceanside, California. Mr. Ott served as the design task manager for the conveyance design portion of a $150M design-build project to upgrade wastewater infrastructure at the Marine Corps Base Camp Pendleton in Oceanside, California. The conveyance portion of the projects included design of a unique high-head series wastewater pumping station, seven miles of wastewater force main, a 2-mile effluent force main, and re-habilitation of existing percolation ponds. The pump station design included detailed hydraulic surge modeling that resulted in the recommendation to install a bladder style wastewater surge tank at the pump station. Mr. Ott also provided technical support for pumping and plant hydraulics for a new 4-mgd regional treatment plant and expansion of an existing plant, both also included in the P-1041/P-1043 project. Both the new pump station and the plant construction and upgrades happened at or adjacent to existing wastewater treatment plants that remained in service.

Civil Design Task Leader, P-113 Reverse Osmosis Project, Naval Facilities Engineering Command (NAVFAC) Southwest, Marine Corps Base Camp Pendleton, Oceanside, California. Mr. Ott was the task leader for the civil and hydraulic design of a new 10-mgd reverse osmosis (RO) drinking water treatment plant at Marine Corps Base Camp Pendleton delivered using the design-build delivery approach. Mr. Ott's responsibilities included design management and technical oversight of site work (yard piping, grading, paving, and drainage); pump stations (RO feed, treated water, and brine) and a 7-mile long 14-inch brine disposal pipeline from the plant to the ocean. Mr. Ott's leadership on the design of the brine pipeline included coordinating bio-chemical evaluations of scaling potential and mitigation approaches, pipe material and appurtenance evaluation and selection, and the development of detailed design plan and profile drawings for installing the pipeline along Vandegrift Road, which is the main transportation and utility corridor at Camp Pendleton. He also coordinated and reviewed a detailed hydraulic transient/surge evaluation that considered the falling elevation of the pipeline toward the ocean. During construction, he worked closely with the construction team to address unanticipated utility conflicts. The plant portion of the project was delivered using a using 3D/4D design capabilities and the pipeline design was completed using AutoCAD Civil-3D.

Staff Engineer, P-110 Wastewater and Reclaimed Water Conveyance System Design, Naval Facilities Engineering Command (NAVFAC) Southwest, Marine Corps Base Camp Pendleton, Oceanside, California. Mr. Ott was part of the hydraulic and pump station design team for the P-110 conveyance design-build project at Marine Corps Base

Education

BS - Civil Engineering, Colorado State University, 2003

Registration

Professional Engineer: California, Colorado, Washington, and New Mexico

NCEES Record #35317

Camp Pendleton in Oceanside, California. The project included the design of three wastewater pump stations ranging in size from 1.0 to 3.0 mgd, four reclaimed water pump stations up to 4.0 mgd, over 10 miles of HDPE and PVC pipelines, new reclaimed water irrigation systems, and expanded storage facilities. Mr. Ott was a key technical resource in evaluating hydraulic impacts to the existing wastewater treatment plant as scenarios were developed to supply the new reclaimed water system. The project included complex hydraulic conditions due to long pumping distances and large elevation changes. Mr. Ott was involved in hydraulic calculations, pump selection, wet well design, mechanical piping layout, sub-discipline coordination, submittal review, RFI responses, and construction engineering support. Additionally, Mr. Ott was responsible for writing a comprehensive Operations and Maintenance Manual for the project that describes in detail normal and emergency operations, as well as startup, shutdown, troubleshooting, repair, and preventive maintenance procedures.

Conveyance Design Engineer, Fort Irwin Water Treatment and Distribution System, United States Army Corps of Engineers, Fort Irwin, California. Mr. Ott was responsible for the hydraulic and pipeline design on a $101M design-build project for the United States Army Corps of Engineers at Fort Irwin, California. The conveyance portion of the project includes over ten miles of new raw water and potable water transmission and distribution pipelines up to 24-inches in diameter, three new groundwater wells, and a new booster pump station. The project required close coordination and modification to the existing booster pump stations, well facilities, and pipelines to ensure the new system remains within the hydraulic parameters of the existing system and to minimize impacts to Base operations. Mr. Ott was responsible for coordinating hydraulic transient/surge investigations on the new pipelines and implementing the design recommendations of specifically configured air valves and surge anticipator valves.

Conveyance Hydraulics Task Leader, Pojoaque Basin Regional Water System, U.S. Department of the Interior, Bureau of Reclamation, Albuquerque Area Office, Albuquerque, New Mexico. Mr. Ott was the conveyance hydraulics task leader for the design of major pumping systems and transmission pipelines on the Pojoaque Basin Regional Water System (PBRWS) progressive-design build project under direction of the United States Bureau of Reclamation. His responsibilities included directing steady state and transient hydraulic modeling to develop the system layout for transmission piping, pump stations, and storage tanks. He also oversaw water age and water quality investigations in the expanded distribution system, which presented unique challenges due to the geographical extent of the system and relatively low initial flow demands.

Project Engineer, Orange County Sanitation District, P2-122 Headworks Modifications at Plant No. 2 for Groundwater Replenishment System Expansion, Fountain Valley, California. Mr. Ott is serving as the technical lead on modifications and upgrades to an existing 340-mgd influent pump station and headworks facility, including pump modifications, gate installations, and new yard piping. The work requires close coordination with plant operations staff to ensure the critical facility remains fully functional during all construction activities.

Sejal Mehta, PE

Electrical, I&C, SCADA

Ms. Mehta is an experienced engineer specializing in power and control systems design. She has over eight years of experience in the analysis of electrical transmission and distribution systems, including short circuit analysis, coordination studies, load flow and arc flash calculations, and cost estimating. She has expertise in commissioning and start-up field services, as well as performing Electrical System Studies using ETAP, SKM, and Aspen power system tools. She is knowledgeable of National Electric Code (NEC), Institute of Electrical and Electronic Engineers (IEEE) Standards, National Fire Protection Association (NFPA), and equipment specifications. Ms. Sejal has designed and analyzed electrical substations, power plants, and electrical systems for industrial facilities, including water, wastewater, and pump stations.

Electrical Engineer, Narragansett Bay Commission Bucklin Point Facility- Standby 4160 V Generator Addition, East Providence, Rhode Island Ms. Mehta served as the electrical engineer for the 5-kV standby generator addition for the Bucklin Point Wastewater Treatment Facility. Project components included adding an additional standby generator and integrating it with existing controls, adding a new medium voltage switchgear new relay protection, new generator breaker controls, and adding a new PLC.

Lead Electrical Engineer, Encina Water Pollution Control Facility- SCADA Improvements, Encina Wastewater Authority, Carlsbad, California. Ms. Mehta served as the lead electrical engineer for the SCADA improvements for the Encina Water Pollution Control Facility. Project components included replacing existing server racks, adding new fiber optic termination cabinets and server and network racks at the plant and adding a new server room.

Lead Electrical Engineer, Monroe Street Lift Station Improvements, City of Omaha, Nebraska. Ms. Mehta led the electrical component of the Monroe Street Lift Station Improvements project that includes improvements to main electrical service, adding a standby generator, replacing existing pumps and VFDs, valves, controls, instruments, adding a pre-fabricated electrical room, replacing existing instrumentation and control systems.

Lead Electrical Engineer, Johnson County Water Fats, Oils, and Grease (FOG) Upgrades, Johnson County, KS. Ms. Mehta is leading the electrical design for the FOG project, which includes adding three mixing pumps for the three existing FOG Tanks. The design includes adding VFDs for the new mixing pumps and replacing the existing PLC panel.

Lead Electrical Engineer, Ventura WRF Digester Improvements Ms Mehta responsibilities include to provide engineering services support during construction. Project scope includes to review submittal, shop drawings, and respond to RFIs.

Education

MS – Electrical Engineering, University of Colorado Denver, Denver, Colorado (2012)

BE – Jawaharlal Nehru Technical University, Hyderabad, India (2010)

Registration

Professional Electrical Engineer: California

Electrical Engineer, Wastewater Treatment Plant 1 Headworks Upgrade, Orange County Sanitation District, Fountain Valley, California. Ms. Mehta designed a 12-kV feeder, relay protection, and the power distribution system. She designed lighting using AGI Software. She cost-estimated the electrical design, created the plant's duct bank layout, and completed an electrical system study with ETAP.

Electrical Engineer, Modesto River Trunk Pump Station, City of Modesto, California. Ms. Mehta designed the electrical components of the 50 million-gallon-per-day, 90-foot-deep pump station. She designed power distribution system, electrical room and also created control schematics, duct bank layout and sections, Ampcalc, and lighting.

Lead Electrical Engineer, Nitrification Facility Wastewater Treatment Plant Miscellaneous Improvements, City of Las Vegas, Nevada. Ms. Mehta designed the replacement of the VFDs, heavy sludge scum pump replacement, addition of new prefab building, conduit layout, lighting, and addition of emergency stops.

Electrical Engineer, Vista Lift Pump Stations, City of Vista, California. Ms. Mehta provided the electrical upgrade design for the Buena Creek, Buena Vista, and Raceway pump stations. She also designed control schematics, conduit layout for the new system.

Lead Electrical Engineer, Well Automation and Rehabilitation, Mesa Water District, Costa Mesa, California. The project replaced well pumps at five different sites and involved replacing distribution system. Ms. Mehta's electrical design included power distribution, motor control centers, control schematics, and conduit layout for the new systems.

Lead Electrical Engineer, Pump Station Study, City of Sacramento, California. Ms. Mehta wrote a short circuit study, coordination study and arc flash study using SKM Power Tools® software for 35 pump sites' electrical systems.

Lead Electrical Engineer, Distribution Coordination Study, ExxonMobil, Chad, Africa. Ms. Mehta proposed relay setting changes for Micom Relays so that the existing fuse saving scheme was disabled, helping the distribution become more reliable.

Electrical Engineer, 345kV-34,5kV Substation, Buffalo Dunes Wind Farm, Garden City, Kansas. Ms. Mehta designed the substation, including developing one-line, three-lines, DC schematics, wiring diagrams, and relay settings. She also conducted relay testing and commissioned the substation.

Electrical Engineer, Hydroelectric Power Plant, Black Eagle Dam, Great Falls, Montana. Ms. Mehta created control schematics and wiring diagrams for switchgear, GSU, and relay panels and performed field startup services.

Alan Hahn, PE, SE

Structural

Mr. Hahn is a structural engineer with over 10 years of experience developing structural designs for environmental, commercial and governmental facilities projects. His experience includes structural design management, project coordination, drawing and specification development, and resource and budget allocation. Structural design includes analysis of the building system for code requirements, including loading, material selection and structural detailing.

Structural Engineer, P2-122 Headworks Modifications at Plant No. 2, Orange County Sanitation District, Orange County, California. Mr. Hahn performed structural engineering for the construction documents for the headworks modifications at Plant 2 to separate the non-reclaimable flow stream from the incoming wastewater in order to supply the recyclable flow to the Orange County Water District (OCWD) groundwater replenishment system (GWRS). Mr. Hahn performed several confined space entries into multiple wastewater treatment structures during operation shut-downs in order to determine the existing conditions of the facility to help determine the necessary modifications to the existing structures. The structural design effort required the design of new concrete structures, analysis of existing structures for required modifications including a dynamic analysis of an existing elevated pump motor floor, and the design of modifications to existing structures to allow for an additional flow stream within the existing structures.

Structural Engineer, San Luis Rey Water Reclamation Facility Expansion, City of Oceanside, Oceanside, California. Mr. Hahn led the structural design for a design-build expansion of an existing water recycling facility for the City of Oceanside. The expansion included the construction of an existing concrete chlorine contact basin, floc basin, chemical tank foundation, raw water pump station and masonry electrical building.

Civil Engineer, Carlsbad Water Reclamation Facility Phase 3 Expansion, City of Carlsbad, Carlsbad, California. Mr. Hahn was responsible for the structural design of upgrades to an existing membrane feed pump station, upgrades to existing chemical storage facilities, and the expansion of an existing chlorine contact basin including the rapid mix system. The upgrade doubled the capacity of the chlorine contact basin from 4 mgd to 8 mgd, and required the design a new foundation for a new pre-engineered steel canopy and new membrane filters.

Civil Engineer, Tertiary Filtration Plant Replacement, Santa Barbara, California. Mr. Hahn assisted with the structural design for a new foundation and canopy for new microfiltration and ultrafiltration equipment. The tight project site required the demolition of an existing concrete filter basin, while the poor site soils required that the new foundation be tied into the basin's existing pile supported concrete slab. The project also required the installation of new vertical turbine feed pumps and structural evaluation of several existing steel and concrete tanks.

Education

M.Eng. – Structural Engineering, University of Michigan, 2007

BS - Civil Engineering, Michigan State University, 2006

Registration

Professional Engineer: Arizona, California, Idaho, Michigan, New Mexico, and Oregon

Structural Engineer: Arizona, California, Idaho, Nevada, New Mexico, and Oregon

Civil Engineer, Ventura Water Reclamation Facility Dewatering Centrifuge Equipment Replacement Project, City of San Buenaventura, California. Mr. Hahn performed structural engineering design for the addition of new dewatering centrifuges to an existing dewatering building. Mr. Hahn analyzed the existing cast-in-place concrete structure for the additional gravity and vibratory loading of the new centrifuges to the second floor of the existing building, and design new concrete supports for the centrifuges.

Civil Engineer, Ventura Water Reclamation Facility Digester Rehabilitation Project, City of San Buenaventura, California. Mr. Hahn performed structural engineering design for modifications to the existing digester structures and the existing digester building. Modifications to the digesters included the addition of new pipe penetrations and supports within the cast-in-place digesters and the replacement of the existing steel covers on the top of the dome. Modifications to the existing digester building included the addition of a new monorail supported from the existing building roof structure, a new jib crane supported on a new foundation within the building replacement of the existing grating over existing pipe trenches.

Structural Designer, United States Marine Corps (USMC) Base Camp Pendleton P-1041 Southern Region Tertiary Treatment Plant (SRTTP) Expansion, Camp Pendleton, California. Mr. Hahn performed structural engineer design for the design-build (D-B) project. The P-1041 project includes the design and construction of the expansion of a tertiary treatment plant from 5.0 mgd to 7.5 mgd annual average daily flow to meet the effluent permit limits for biochemical oxygen demand, total suspended solids, and total nitrogen. The new facilities will build closely upon the existing design. The main liquid treatment facilities include, influent pumping, screening, sequencing batch reactors, filtration and disinfection. The solids treatment/handling facilities include waste activated sludge thickening, aerobic sludge digestion, sludge dewatering, and biosolids storage.

Structural Engineer, Inland Empire Utility Authority Carbon Canyon Water Recycling Facility Screen Replacement and Expansion, Chino, California. Mr. Hahn is the lead structural engineer for the design of a new dumpster storage building, the expansion of an existing screening channel, and a condition assessment and repair recommendation for several existing structures. This project will modify an existing facility to expand the capacity from 15 mgd to 30 mgd and to provide the required capacity to 2035.

Structural Engineer, Burt-Izard Lift Station Improvements, City of Omaha, Omaha, Nebraska. Mr. Hahn performed structural engineering design related to modifications to an existing 1960's lift station. Modifications included new pumps, expanded electrical room on a new elevated floor slab, bridge crane replacements and additions, bar screen room and channels, grit basin and building modifications, and various electrical and HVAC improvements. The design effort required the analysis of the existing structural system considering not only the new modifications, but also considering several modifications since the facility was constructed.

Matthew R. Smith, CCM

Field Inspection, CM Services

Mr. Smith is a certified construction manager who brings more than 30 years of specialized experience working on water and wastewater treatment plants, water transmission pipelines, pump stations, power generating facilities, ocean dredging projects, and upstream oil and gas programs. His expertise and experience span project management, construction management, contract administration, estimating, and scheduling services. As a project and construction manager, Mr. Smith's responsibilities include planning, as well as management and oversight of engineering design, land acquisition, permitting, pre-construction, estimating, scheduling, subcontracting, project completion, start-up, and close-out. Matt continues to assist our team with expanding construction management services in the West, particularly in California.

Constructability Advisor, REB Plant Washwater Tank and Clearwell Seismic Improvements | Mechanical Dewatering and Dieguito Dam Improvements, Santa Fe Irrigation District, Rancho Santa Fe, California. Mr. Smith is providing constructability support and senior level oversight for two construction contracts at the RE Badger Treatment Filtration Plant. Mr. Smith is working closely with CDM Smith's Project Director to manage the professional services contract with SFID, to ensure adequate resources are in place throughout the project. He is providing senior level CM expertise and project oversight. Mr. Smith is also supporting the field staff as they execute on-site CM and inspection activities and provides on-site support during peak periods.

Owner Advisor-Construction Manager, New Headworks at San José Santa Clara Regional Wastewater Facility, City of San Jose, California. Mr. Smith is providing on-site construction management services to support the City during the construction phase by providing construction management oversight and related services, including resident engineer services, project controls, and testing, start-up, and commissioning supervision.

Senior Construction Manager, P2-122 Headworks Modifications at Plant No. 2 for the Groundwater Replenishment System (GWRS) Final Expansion Orange County Sanitation District (OCSD), Fountain Valley, California. Matt provided constructability assessments on preliminary design concepts for the OCSD project. The primary goal of the study was to identify how the Sanitation District's treatment systems can be modified to deliver 170-mgd of secondary effluent to OCWD to enable the GWRS Final Expansion to 130 mgd. Due to detailed constructability reviews and workshops CDM Constructors staff as well as client CM staff, the project was delivered well under the client's expected budget.

Principal-in-Charge, Puente Valley Operable Unit, Construction Management Services, Northrop Grumman, City of Industry, California. Mr. Smith served as principal-in-charge for the management of all project contracts for Northrop Grumman's Puente Valley Operable Unit (PVOU). He ensured the overall goals of schedule, budget, and quality were met. He implemented the construction management (CM) plan and integration of the CM team into the client project team, design engineer, and contractor. Mr. Smith coordinated with the contractor's project manager, provided oversight of all CM activities, and managed sub-consultants. He provided oversight during commissioning, start-up, and integration.

Education

BS, Construction Management, Cal Poly, San Luis Obispo, 1989

Certifications

CCM, CMCI ID #6966, Construction Management Association of America (CMAA)

Principal-in-Charge, On-Call Construction Management Services, West Basin Municipal Water District, Multiple Locations, California. Mr. Smith served as principal-in-charge for task order assignment and management oversight. He provided third-party on-call CM services for the implementation of task orders for various rehabilitation and replacement (R&R) capital improvement program (CIP) projects for the West Basin Municipal Water District (WBMWD). The on-call CM services included project management, safety management, contract administration, document control, change management, inspection services, quality assurance, and quality control, schedule management, materials testing, labor compliance, constructability reviews, and cost estimating.

Senior Construction Manager, Finished Water Polishing, Mesa Water Reliability Facility, Mesa Water District, California. Mr. Smith was the senior construction manager for the Mesa Water Reliability Facility (MWRF), which opened in 2012, and features two deep-water wells, a one-million-gallon reservoir, and state-of-the-art nanofiltration technology. The deep-water wells pump raw water from approximately 1,000 feet underground. The water is soft and meets all water quality standards but contained an amber color. A nanofiltration technology treatment process is used to remove the organic color while sand separators and other filters removed inorganic materials. Chloramines are used to disinfect the water before leaving the facility. The water then moves into the on-site reservoir before being pumped into the Mesa water distribution system. On one project, Matt was involved with had start-up and commissioning issues with the chemical feed system, which required after hours and weekend work to troubleshoot a solution with the contractor and designer in a collaborative style.

Lead Construction Manager, Hyperion Treatment Plant, City of Los Angeles, Los Angeles, California. Mr. Smith served as lead construction manager for a staff augmentation assignment to deliver CM services with responsibility for CM of seven distinct projects as well as support staff. The Hyperion Treatment Plant (HTP) is undergoing significant improvements valued at several hundred million dollars over the next few years. On average, 275 mgd of wastewater enters the Hyperion Water Reclamation Plant on a dry weather day. The plant was designed to accommodate both dry and wet weather days with a maximum daily flow of 450 mgd and peak wet weather flow of 800 mgd.

Construction Manager, Point Loma Wastewater Treatment Plant Grit Improvement, City of San Diego, San Diego, California. Mr. Smith served as the on-site manager responsible for the construction management and inspection team for the $28M Point Loma Wastewater Treatment Plant (WWTP) grit improvement project (GIP) with multiple plant shutdowns. He proactively introduced the City's engineering and capital improvements division to a SharePoint project management system for efficient team collaboration.

Carlos A. Melvin

Field Inspection, CM Services

Carlos has 20 years of environmental and civil engineering experience providing CM and quality control inspection for water, wastewater, solid waste, soil and hazardous waste management projects. Carlos has provided RE services for projects worth more than $200 million in construction.

Resident Engineer, Santa Fe Irrigation District, REB Plant Washwater Tank and Clearwell Seismic Improvements | Mechanical Dewatering and Dieguito Dam Improvements, Rancho Santa Fe, California. Mr. Melvin is providing resisdent engineer services for two construction contracts at the RE Badger Treatment Filtration Plant. The services covered field engineering support, coordination between Contractor and the operations team, faciliting bi-weekly construction meetings, conflict resolution, potential change order (PCO) and CO support to CM, managing and inspecting special inspection services, submitting daily reports, monthly billings for each contractor and coordination with client, redline mark-ups and facilitating the RFI and submittal process through the document management system (i.e e-Builder).

Project Engineer, Enginnering Services Through Construction, Encina Water Pollution Control Facility – Primary Area Improvement Project, City of Carlsbad, California. Mr. Melvin is providing enginnering services through construction for the expansion project at the Encina facilities screening area. The project is valued at $11.2 million and consists of coordinating with enginnering, construction manager, contractor and the client to resolve technical isues that surface through RFIs, submittals, field orders or change orders. Mr. Melvin's main responsibilities focus on supporting and managing RFIs, submittals and field orders, attending weekly meeetings, conflict resolution and will eventually focus on MOPO and start-up support.

Construction Quality Control Manager, Water Reclamation Facility Upgrades Design and Construction Management, City of Avondale, Arizona. Mr. Melvin provided construction quality control services for the upgrades at Avondale. This Construction Manager at Risk (CMAR) project includes two new clarifiers, as well as a new Return Activated Sludge pump station. Mr. Melvin's main responsibilities consisted of conducting weekly quality controls (QC) meetings, generating and submitting daily QC Reports, scheduling and conducting preparatory and initial phase meetings for all definable features of work, as-built/record drawings, coordinating third party testing, managing re-work activities, and inspecting daily construction activities.

Construction Quality Control Manager (CQCM), Marine Corps Base Camp Pendleton, P-1043 (Northern Regional Tertiary Treatment Plant – NRTTP), Camp Pendleton, California. Mr. Melvin provided CQCM services for a new 5-mgd wastewater treatment plant (NRTTP) at Camp Pendleton. Mr. Melvin's main responsibilities consisted of conducting weekly QC meetings, generating and submitting daily QC reports, scheduling and conducting Preparatory and Initial Phase meetings for all definable features of work, creating as-built/record drawings, coordinating third-party testing, managing rework activities, and inspecting daily construction activities. These activities focused on the

Education

BS – Environmental Resource Engineering, Humboldt State University Arcata, California, 1999

Certifications

NAVFAV Construction Quality Control Manager

construction and start-up of a new wastewater treatment plant that would centralize and process wastewater for the northern region of Camp Pendleton.

CQCM, Marine Corps Base Camp Pendleton, P-1043 (TAPS12/Conveyance/Ponds and Solar), Camp Pendleton, California. Mr. Melvin provided CQCM services to the P-1043 project at Camp Pendleton. His main responsibilities consisted of conducting weekly QC meetings, generating and submitting daily QC reports, scheduling and conducting Preparatory and Initial Phase meetings for all definable features of work, creating as-built/record drawings, coordinating third-party testing, managing re-work activities, and inspecting daily construction activities. These activities were focused on the expansion of the existing TAPS12 facility into a pump station, expansion of the existing infiltration ponds (Sierra One and San Onofre), installation of a force main between the pump station and NRTTP, and the initial solar installation at the Sierra One Ponds.

CQCM, Marine Corps Base Camp Pendleton, IM-24 Water Filtration Plant, Camp Pendleton, California. Mr. Melvin provided CQCM services to the IM 24 Water Treatment Plant Expansion project at Camp Pendleton. Mr. Melvin's main responsibilities consisted of conducting weekly QC meetings, generating and submitting daily QC Reports, scheduling and conducting Preparatory and Initial Phase meetings for all definable features of work, as-built/record drawings, coordinating third party testing, managing re-work activities, and inspecting daily construction activities.

CQCM, Alternate, Marine Corps Base Camp Pendleton, P-113 Advanced Water Treatment Project, Camp Pendleton, California. Mr. Melvin provided alternate CQCM services to various water, wastewater and conveyance construction projects at Camp Pendleton (i.e. SRTTP Expansion and P-113). The projects range from a few million to $50 million in construction cost and stretched over a few days to months of support. Mr. Melvin's main responsibilities consisted of conducting weekly QC meetings, generating and submitting daily QC Reports, and inspecting daily construction activities.

Assistant Project Manager/QC Manager, Miramar Water Treatment Plant Expansion/ Upgrade, Contract C – Ozone and LOX Equipment Installation and Start-Up, City of San Diego, California. Mr. Melvin provided design and construction support through the expansion of the Miramar Water Treatment Plant. The plant was designed by CDM Smith and others and expanded from 140- to 215-mgd. The expansion of the treatment plant (Contract C) consisted of incorporating ozone for disinfection for the city's largest water treatment plant (required LOX generation on-site). The role consisted of RFI, submittal and plan clarification review, processing and management. Mr. Melvin was also responsible for attending and contributing to weekly construction progress meetings and providing field support. In addition, the role involved budget monitoring, invoicing and coordination with all sub-consultants. Further support was provided for change orders, contractual disagreements, construction quality control, start-up of new processes and generating record drawings.

CDM Smith®

cdmsmith.com

PREPARED FOR
SAN ELIJO JOINT POWERS AUTHORITY

ON-CALL ENGINEERING SERVICES FOR San Elijo Water Campus and Remote Facilities

QUALIFICATIONS | December 2020

carollo
Engineers...Working Wonders With Water®

Table of Contents

carollo
Engineers...Working Wonders With Water®

5355 Mira Sorrento Place, Suite 270, San Diego, California 92121
P. 858.505.1020 F. 858.505.1015

December 22, 2020

Mr. Michael Thornton, PE
San Elijo Joint Powers Authority
2695 Manchester Avenue
Cardiff by the Sea, CA 92007

Subject: On-Call Engineering Services for the San Elijo Water Campus and Remote Facilities

Dear Mr. Thornton:

Carollo Engineers looks forward to the opportunity to continue our long-standing working relationship with the San Elijo Joint Powers Authority by providing you with strong, local resources to support your on-call engineering projects. As you move forward with providing exceptional wastewater treatment, recycled water distribution, and possibly a regional Pure Water project, you will continue to rely on competent, professional, and responsive consultants like Carollo to deliver your important projects. Our locally based staff are well qualified to perform your requested services for the following reasons:

- **A specialized team of Carollo personnel with resources and technical expertise located here in San Diego that you know and trust.** As your contract manager, Jeff Weishaar will be your direct point of communication for the on-call projects. Jeff has more than 15 years of experience managing multidisciplinary teams and has managed numerous on-call contracts across Southern California. Jeff is also very familiar with your staff and facilities and will make it his personal goal to ensure that our design and planning leads have the correct staffing and the necessary resources to deploy their teams and work on your projects.

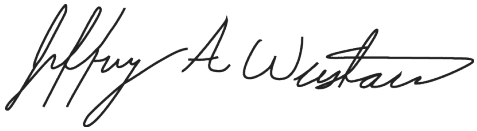
- **Depth of local resources means lower costs.** Carollo's staff is located across five offices in Southern California, with the bulk of our resources located in San Diego and Orange County. This means we will have the right staff for your projects, without having to transport specialists from out of state. By providing you with local resources to complete the work, we'll save you the cost of travel and overhead expenses. We specialize in delivering projects that are similar to yours, whatever the size. This "bench strength" provides you with an exceptional range of expertise, continuous peer reviews, and allows for incorporation of state-of-the-art design features for all of your projects.

- **A full-service firm that you can count on.** Carollo is the largest water-focused engineering firm in the country. And for more than 75 years, we have provided engineering, planning, and construction management services to water and wastewater agencies in the Southern California region. We maintain on-call contracts throughout the state and are familiar with the needs presented with an on-call contract format.

We look forward to continuing our working relationship and helping you to deliver your most important on-call projects. Thank you for your consideration. Please contact me at 858-245-6081 or jweishaar@carollo.com if you have any questions.

Sincerely,

CAROLLO ENGINEERS, INC.



Jeff Weishaar, PE
Contract Manager

Executive Summary

WATER IS ALL WE DO!

Carollo is the #1 ranked water engineering firm specializing in the planning, design, and construction management of water, wastewater, and recycled water facilities in the United States. We are 100-percent focused on these services resulting in a level of understanding of key issues that few can match. Carollo applies sound, proven engineering principles to advance the application of water technologies and engineering excellence that is unmatched in our industry.

FIRM BACKGROUND

During the length of our entire history, Carollo has successfully completed more than 25,000 projects. Unlike the majority of our competitors, Carollo only provides water and wastewater engineering services. We recruit nationwide and hire technical staff with extensive background and training specific to this field. For that reason, the quality and professional standing of our core group of water and wastewater professionals equals or exceeds that provided by some of the largest engineering firms in the country.

Since our inception, Carollo has become a world leader in water, wastewater, and recycled technology. In the past 5 years alone, Carollo has completed or has ongoing, water, wastewater, and recycled water projects totaling more than $1 billion dollars.

Although Carollo has a national presence, our success has been built on our focused service to our local clients just like the San Elijo Joint Powers Authority.

WITH OUR FIVE SOUTHERN CALIFORNIA OFFICES, CAROLLO IS ONE OF THE LARGEST FIRMS TO EXCLUSIVELY PERFORM WASTEWATER ENGINEERING SERVICES IN THE REGION

SAN ELIJO JOINT POWERS AUTHORITY // ON-CALL ENGINEERING SERVICES FOR SAN ELIJO WATER CAMPUS AND REMOTE FACILITIES

Our **PRIMARY** focus is to provide outstanding service to our local clients. And, because of our extended history working on projects in San Diego County, our team is very familiar with not only your staff and facilities, but also your possible challenges. We have an unmatched, broadly based familiarity with the various permitting agencies, regulations, and design standards of various counties and cities.

At Carollo we very much understand the role to be played in the success of this contract by participating on an on-call basis. The range of services that may be needed could cover a large spectrum of activities, including planning, engineering design, and construction support. We have performed these services, locally, for the City of San Diego, Encina Wastewater Authority, Otay Water District, Padre Dam MWD, Santa Fe Irrigation District, and others throughout our region with great success.

OUR PROPOSAL DEMONSTRATES OUR UNDERSTANDING AND ABILITY TO REACT TO YOUR NEEDS IN AN ECONOMICAL AND TECHNICALLY SOUND APPROACH

Our staff is available, conveniently located, and COMMITTED

A core team of 175+ professionals, all located in Southern California, will respond to the requirements of this contract. Availability of consultant staff for design projects can be a cause for concern for many clients. This is where Carollo's team resources bring a distinct advantage. The organization chart we have provided shows our proposed staff of key personnel and technical resources. These are the staff we are committing to your project, they are ALL located in San Diego and Orange Counties, and we will make them available.

We have developed a project team which will be **RESPONSIVE** in delivering your on-call engineering projects. These leaders were hand-picked by Jeff Weishaar to achieve several objectives:

- Rapid response to your task order requests.
- On-time and on-budget delivery of all task orders.
- Engagement of only qualified staff that best suit the project needs.
- Confirm our Internal Quality Assurance and Review audits.
- A management team approach to make sure staff availability and delivery of quality products.
- Special attention to your needs and augment your staff in whatever way we can.

Our organization for this contract includes the experienced and proven exemplary leadership of Jeff Weishaar. He will engage the Carollo team to make sure the right response is being developed to each task order request. Being a Vice President in our organization with more than 15 years of project management experience, Jeff is committed to making sure all Carollo deliverables meet the goals, procedures, processes, and objectives of the San Elijo JPA.

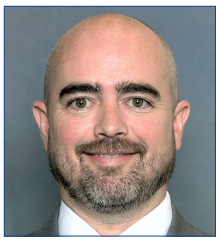
Qualifications of Key Personnel

A key prerequisite to making great things happen on an on-call engineering services contract like yours is to bring on board professionals who not only have the experience, but also the technical understanding to deliver quality planning and design services. We will leverage our experience with lessons learned on previous projects at your facility, and similar as-needed projects to achieve your goals in the most cost efficient and productive way. Our organizational chart on page 18 introduces our entire project team and identifies communication and functional and reporting responsibilities.

IT IS OUR GOAL to help you efficiently manage each assignment by providing you with staffing support and local professionals with the necessary experience and dedication to make every project a success.

Highlights of our key personnel that will work on your projects follow. Resumes for 10 select key personnel are included at the end of our SOQ.

KEY LEADS



Jeff Weishaar, PE

Engineering Services Contract Manager

Jeff is a Vice President and senior wastewater treatment planning and design engineer. He has had a leadership role in the design of projects involving nearly all aspects of water/wastewater treatment processes and facilities, including conveyance system design and comprehensive wastewater treatment plant improvements. Jeff has completed multiple rehabilitation projects throughout California for various clients. His insight into your facilities, operations, and design protocols will be key in planning, designing, and executing your projects.

Relevant Experience

- Project manager, As-Needed Engineering Design Services and Construction Management, Encina Wastewater Authority, CA.
- Program manager, Regional WRF Program Management, Elsinore Valley Municipal Water District, CA.
- Deputy program manager/task order manager, As-Needed Engineering Services, County of San Diego, CA.

Amy Martin

Recycled Water Lead

Amy is Carollo's Southern California Planning and Water Resources Manager and brings more than 14 years of engineering project management and planning experience in both the public and private sector. She has led the development of more than 30 master plans and hydraulic modeling projects throughout the region. She has experience in master planning, hydraulic modeling, sewer system management planning, urban water management planning, and geographic information systems (GIS).

Relevant Experience

- Project manager and lead planner, Recycled Water Feasibility Study, Inland Empire Utilities Agency/City of Pomona/Monte Vista Water District, CA.
- Assistant project manager, 2018 Integrated Master Plan, City of Banning, CA.
- Lead planner, Recycled Water Master Plan, Moulton Niguel Water District, CA.

Graham Juby, PhD, PE

Wastewater Treatment Design Lead

Graham has 37 years of experience in planning, testing, and process design for water and wastewater treatment facilities, with an emphasis on water reuse. He has focused on advanced treatment processes such as low- and high-pressure membrane systems (microfiltration and reverse osmosis), nutrient removal, and the application of ozone, granular activated carbon, biological filtration, ion exchange, and ultraviolet. His background in these technologies includes both pilot plant and full-scale design experience. His experience also includes a number of planning projects. He has also been involved with several fast-track and alternative delivery projects.

Relevant Experience

- Principal-in-charge/project manager, 2020 Update of the Integrated Master Plan for the Wastewater Collection and Treatment Facilities, City of Riverside, CA.
- Principal-in-charge, Warm Springs Lift Station Condition Assessment and Design, Eastern Municipal Water District, CA.
- Principal-in-charge, San Jacinto Regional Water Reclamation Facility Plant 1 Rehabilitation, Eastern Municipal Water District, CA.

Andrew Frost, PE

Pipeline Design Lead

Andrew has 12 years of experience in civil engineering design including pipelines, sewer mains, storm drains, potable/recycled water, dry utilities, road-way, grading, and site design. He has provided support for water quality management plans (WQMP) to comply with Municipal Separate Storm Sewer System (MS4) permitting and prepared storm water pollution prevention plans (SWPPP) and incorporated post-construction best management practices (BMP) into project design to meet local and statewide requirements. He is highly versed in 3D design and drafting including the use of Civil 3D, Navisworks, and Building Information Modeling.

Relevant Experience

- Project manager, Phase I Collection System, Hi-Desert Water District, CA.
- Project manager, As-Needed Water/ Wastewater Engineering Services, County of San Diego, CA.
- Senior engineer, 84-inch Land Outfall Improvements, Encina Wastewater Authority, CA.

Miko Aivazian, PE

Pump Stations/Reservoirs Design Lead

Miko has 31 years of experience in planning, design, and construction of pumping stations and reservoirs for municipal and agency clients. He has been involved as a senior project/client manager and engineer for hundreds of water/wastewater projects for more than 27 years, including planning, study, design and construction management of pumping stations, lift stations and reservoirs.

Relevant Experience

- Project manager, Diamond Regional Sewer Lift Station and Dual Force Mains, Elsinore Valley Municipal Water District, CA.
- Project manager, Cistern C Design-Build, San Diego Airport Authority, CA.
- Project manager, Sunset Reservoir Replacement Preliminary Design, City of Pasadena, CA.

Vincent Roquebert, PE, PMP

MF/ RO Treatment Design Lead

Vincent has 30 years of experience with providing MF/RO designs for treatment plants across Southern California. His experience includes membrane and conventional process engineering, design, procurement, installation, and commissioning, with a focus on alternative delivery methods. Vincent leads Carollo's membrane filtration facilities design group.

Relevant Experience

- Design engineer, Terminal Island Water Reclamation Plant AWPF Ultimate Expansion, City of Los Angeles Bureau of Engineering, CA.
- Project manager, Mel Leong Treatment Plant Industrial Wastewater and Recycled Water Upgrades, San Francisco International Airport, CA.
- Technical reviewer, Valencia WRP Advanced Water Treatment Facility, Santa Clarity Valley Sanitation District/ Los Angeles County Sanitation Districts, CA.

Troy Hedlund, PE

Electrical Engineering Lead

Troy has 18 years of experience as a project manager and as an electrical and instrumentation engineer in the design of water and wastewater treatment plants, largescale solar photovoltaic (PV) systems, and cogeneration facilities. His experience encompasses all phases of project implementation (planning, design, and construction) and many facets of EI&C engineering including high-, medium-, and low-voltage power distribution and generation system design, process and motor controls, and SCADA and PLC network design.

Relevant Experience

- Project manager and lead E&I engineer, Pump Stations 1 and 2 Electrical Upgrades, City of San Diego, CA.
- Lead electrical engineer, P1-105 Headworks Rehabilitation and Expansion, Orange County Sanitation District, CA.
- Lead E&C design engineer, North City Pure Water Facility Final Design, City of San Diego, CA.

Monte Richard, PE

SCADA Lead

Monte brings national experience in electrical and control system engineering and design. His focus is in electrical distribution systems, process control, and industrial instrumentation for wastewater treatment and pumping facilities. He has led hands-on testing, start-up, optimization and troubleshooting of wastewater treatment plants alongside plant operators and managers. This in-depth experience with operation of wastewater facilities helps Monte deliver innovative, tailored solutions within budget constraints.

Relevant Experience

- Lead I&C engineer, Major Plant SCADA Upgrades, City of Oceanside, CA.
- Lead I&C engineer, SCADA Master Planning and I&C Design, City of Prescott - Water and Sewer Division, AZ.
- Lead I&C engineer, Southeast Surface Water Treatment Facility SCADA Planning, City of Fresno, CA.

Moe Sanchez

Construction Management Lead

Moe brings more than 25 years of experience in the construction management of water and wastewater treatment plants. He is an OSHA-certified lead inspector of Carollo's construction services group and has successfully brought designs to life through his ability to think on his feet, problem solve, and effectively implement safety processes and training programs. Moe specializes in water and wastewater treatment plant construction, with experience ranging from complex ozone and chemical treatment processes to conventional mechanical pump stations, pipelines, and civil site work.

Relevant Experience

- Deputy construction manager/lead inspector, Southeast Surface Water Treatment Facility, City of Fresno, CA.
- Superintendent, Water Treatment Plant No.4, City of Austin, TX.
- Inspection engineer support, Encina Water Pollution Control Facility, Encina Wastewater Authority, CA.

Brian Graham, PE

O&M Training Lead

Brian is an environmental engineer and operator with 34 years of experience encompassing design and operation of advanced water and wastewater treatment systems, biological nutrient removal, RO water treatment, biosolids management, master planning, wastewater process modeling, and computer simulation. He has been involved in the design, startup, and operation of numerous advanced wastewater, water, and RO treatment projects throughout the United States.

Relevant Experience

- Project manager, Standard Operating Policies and Procedures, City of San Diego, CA.
- Project manager/engineer, Advance Treatment Operations Training, Altamonte Springs, FL.
- Startup lead and operational support, Clean Water Facility, City of Oak Harbor, WA.

ADDITIONAL STAFF

SUPPORT TEAM MEMBER NAME / ROLE	BRIEF BIOGRAPHIES / RELEVANT PROJECTS
Jeff Thornbury Principal-in-Charge	Jeff's 25 years of experience in San Diego County ranges from water and wastewater engineering design, permitting, water resources and stormwater management, facility design, water and wastewater process, to construction design-build. He has been contract manager and principal-in-charge throughout California on more than 200 water-related projects. Jeff has successfully managed more than $20 million dollars in on-call contracts throughout the past 5 years. ▪ Program director, As-Needed Program Design Services, City of San Diego Public Utilities, CA. ▪ Principal-in-charge, As-Needed Engineering Services, County of San Diego, CA.
Patrict White, PE Quality Manager	Patrick White, a senior vice president in Carollo, has 40 years of professional engineering experience specializing in the area of municipal water treatment facilities planning and design. His experience includes design responsibility for major treatment facilities ranging in size from five to over 180 mgd. ▪ Principal-in-charge, Wastewater Treatment Plant Phase 2 Expansion, City of Santa Maria, CA. ▪ Principal-in-charge, Phase I and II Improvements Project, Palmdale Water District, CA.
Elisa Garvey, PhD, PE Watershed Studies	Elisa has 18 years of experience in water resources planning and treatment evaluations, including water resources management, water quality assessments, regulatory and permitting support, master planning, and monitoring plan development/implementation. She has been involved in treatment research projects for the Water Research Foundation, California Division of Drinking Water, and has conducted several UV disinfection validation studies. She has led water quality assessments, water resources planning and management, and regulatory/permitting support studies. ▪ Project engineer, Special Studies, City of Ventura, CA. ▪ Project engineer, Lower Santa Clara River Salt and Nutrient Management Plan, Ventura County Watershed Protection District, CA.
Bronwyn Kelly, PG, QSD/P Hydrologic Studies	Bronwyn has 18 years of experience on a wide range of water resources projects. For more than a decade, she has managed a team to help a large facility comply with its NPDES permit, Clean Water Act, and other regulatory agency orders/permits. She has also directed the implementation of non-structural and structural BMPs, sampling programs in natural drainages, including treatment systems ranging from passive settling and filtration systems using advanced filtration materials to active chemical/physical treatment of stormwater. ▪ Project manager, TOS SN-61: Specialized Services, Los Angeles Bureau of Sanitation, CA. ▪ Project manager, Water Quality Improvement Plans (WQIPs) for San Diego Watersheds, City of San Diego Storm Water Division, CA.
Jim Rasmus, PE, ENV SP Permitting	Jim has 33 years of experience successfully managing many innovative water reuse, water resources, and stormwater projects across San Diego County. His creative ideas and leadership have led his clients to many awards for innovations. Jim gives back to the water profession through volunteer activities for WateReuse Association, California's Clean Beach Task Force, and mentoring activities with San Diego State University's Senior Design Class. ▪ Project manager, Planning for Stormwater to Supplement San Diego's Pure Water Program, City of San Diego, CA. ▪ Task leader/technical reviewer, Safe Clean Water Program, Los Angeles Bureau of Sanitation, CA.

SUPPORT TEAM MEMBER NAME / ROLE	BRIEF BIOGRAPHIES / RELEVANT PROJECTS
Raj Bhatia Preliminary Engineering	Raj has 35 years of experience in the engineering field with emphasis in the application of computer-aided design (CAD) and 3D modeling, providing leadership on a variety of civil engineering, infrastructure, water, wastewater, and transportation projects. He is Carollo's CAD leader for the southwest region and is actively involved with Carollo's Leadership in Smart Production system strategic initiative, working on the design and CAD in 3D. ▪ CAD lead, Los Coches Sewer Improvements, County of San Diego, CA. ▪ CAD lead, Sewer Manhole Assessment, County of San Diego, CA.
Justin Mercer, PE Bidding/Negotiating	Justin is a civil and environmental engineer with a broad range of experience including environmental monitoring and remediation, civil site design, and water and wastewater design. He has worked as a project engineer for both federal and municipal clients. ▪ Project engineer, Valve Replacement Design, San Elijo Joint Powers Authority, CA. ▪ Project engineer, Warm Springs Lift Station Rehabilitation Final Design, Eastern Municipal Water District, CA.
Rashi Gupta, PE Solids Handling & Digestion	Rashi is a national expert in all things related to solids – from thickening and dewatering to digestion and subsequent practices to beneficially use biogas and biosolids. She serves as Carollo's National Biosolids Technology Integration Lead, which allows her to remain current on leading technologies and changes within the biosolids management field. Her responsibilities as project manager and process specialist on solids-related projects across the country have taken her from the initial planning phase through design to start-up after construction. ▪ Project engineer, Solids Thickening Project, Encina Wastewater Authority, CA. ▪ Project manager, Solids Management Study for the Terminal Island Water Reclamation Facility, City of Los Angeles Bureau of Engineering, CA.
Brandon Yallaly, PE Pure Water	Brandon has 20 years of experience in all areas of membrane treatment design, including membrane softening, reverse osmosis, micro/ultrafiltration, and concentrate disposal. He has executed all phases of membrane-related projects, including process selection, conceptual design, pilot testing, detailed design, and construction-phase and startup services. Additionally, Brandon has executed process and detailed designs implementing lime softening and ion (anion) exchange processes. ▪ Reverse osmosis (RO) process design lead, Pure Water Indirect Potable Reuse Facility, City of San Diego, CA. ▪ Process mechanical design lead and RO process lead, Terminal Island Water Reclamation Plant Advanced Water Purification Facility Ultimate Expansion Design-Build, City of Los Angeles Bureau of Engineering, CA.
James Doering, PE, SE Structural	James is Carollo's structural lead engineer in Southern California. He has experience in structural analysis, design, seismic retrofit, rehabilitation, review, and assessment for a variety of structures, such as wastewater treatment facilities, pump stations, reservoirs, tanks, clarifiers, large pipe supports, retaining walls, operations and maintenance facilities, and office buildings. ▪ Structural engineer, Diamond Regional Sewer Lift Station and Dual Force Mains, Elsinore Valley Municipal Water District, CA. ▪ Structural engineer, Cistern C Design-Build, San Diego Airport Authority, CA.

SUBCONSULTANTS

ESA

Environmental

ESA has a long history and extensive portfolio of experience in Southern California including providing on-call environmental compliance services. ESA's Water Group focuses exclusively on water, wastewater, stormwater, and recycled water utilities infrastructure projects and helps clients navigate regulatory complexities and balance sound environmental projects to minimize environmental impacts, save time and money, and advance strategic resource management and stewardship goals.

RIGHT-OF-WAY
Engineering Services

Right-of-Way Engineering Services

Surveying

Right-of-Way Engineering Services (ROW), located in Oceanside, specializes in all aspects of surveying, computer mapping, and right-of-way engineering services for public agencies. For more than 29 years, ROW has provided quality design surveying, construction surveying, parcel maps, and right-of-way engineering for many clients in Southern California.

UNDERGROUND SOLUTIONS
POSITIVEID

Underground Solutions

Potholing

Underground Solutions, Inc., (USI) provides engineering firms, water & sewer districts, municipal customer and utility contractors safe, fast, economical and accurate underground utility locating. As the leading underground utility location company in Southern California, USI was formed out of necessity by experienced utility contracting experts that realized the need for accurate underground utility locating. USI and their team of highly qualified operators and management are committed to performing fast, safe and accurate utility locating services. Their high velocity air-driven excavation delivers the power to cut precise holes into the earth without damaging the utility being located.

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

Ninyo & Moore

Geotechnical

Ninyo & Moore is a California Corporation, minority-owned, multidisciplinary consulting firm that provides high-quality geotechnical and environmental consulting, and materials testing and inspection services. Ninyo & Moore has had the privilege of providing geotechnical and environmental consulting, soils and materials testing services to San Diego clients on various on-call contracts either as a prime consultant or as a subconsultant for various capital improvement projects. Through the years of providing on-call services, Ninyo & Moore has developed a management approach to provide clients with responsive, efficient, and cost effective services utilizing master agreement contracts with task order or specific work assignments authorizations.

Related Projects

As-Needed Engineering Design Services and Construction Management

ENCINA WASTEWATER AUTHORITY, CALIFORNIA

REFERENCE
Mike Steinlicht, General Manager
760-438-3941 | mikes@encinajpa.com

TEAM MEMBER INVOLVEMENT
Jeff Weishaar - PM; Moe Sanchez - Inspection; James Doering - Structural; Troy Hedlund - Electrical; Rashi Gupta - Solids Handling; Andrew Frost - Civil Engineer; Jeff Thornbury - Principal-in-Charge; Brian Graham - Operations; Miko Aivazian - Effluent Pump Station

Carollo was retained by the Encina Wastewater Authority in 2010 to provide a broad range of facilities planning, engineering design, condition assessment, and construction management projects.

Carollo is currently providing as-needed services to the Encina Wastewater Authority and has served as the preferred consultant for many years. Carollo has provided multiple services including:

- Technology research and piloting
- Wastewater process engineering
- Recycled water engineering
- Surveying
- Site/civil engineering
- Electrical engineering
- Mechanical engineering
- Corrosion engineering
- Cost estimating
- Instrumentation and controls engineering
- Construction management

Current projects including solids thickening improvements to replace aging dissolved air flotation thickeners with rotary drum thickeners. The new process will be relocated to the original dewatering building, freeing up rare space on site for other process improvements. Carollo has also provided services for improvements to the land outfall system, including the land outfall pipe, the surge tower, and the effluent pump station. The recently completed Primary Effluent Conveyance System Improvements project was awarded the 2020 Wastewater project of the Year by the American Society of Civil Engineers. The project designed a 72-inch cured-in-place pipe liner to rehabilitate the primary effluent line along with structural rehabilitation of the primary clarifier effluent channel and junction box and the aeration basin inlet channel. The project included a 60 mgd bypass system to allow the improvements to occur and finished with net change orders of less than one-half percent. The nearly completed Cogeneration Wall Replacement project has been a meticulous and detailed project to investigate a damaged wall of the critical cogeneration wall, construction of whole-building shoring system, and methodical replacement of 100 feet of wall in multiple sections.

Carollo has also been providing construction management services for the last ten years. This includes project and construction for more than $50 million in construction projects. This includes the Major Plant Improvements in 2012 and 2015, Aeration Basin Improvements, Primary Effluent Conveyance System, Cogeneration Building Wall Replacement, Land Outfall Improvements, Digester 6 Improvements, and many others.

As-Needed Engineering Services Contract

CITY OF SAN DIEGO, CALIFORNIA

REFERENCE

Duy Nguyen, Project Manager
858-292-6417 | ddnguyen@sandiego.gov

TEAM MEMBER INVOLVEMENT

Jeff Thornbury - Program Director; Jeff Weishaar - Task Order (TO) Manager; Andrew Frost - TO Manager; Miko Aivazian - TO Manager; Brian Graham - TO Manager; James Doering - Structural; Troy Hedlund - Electrical; Monte Richard - I&C; Raj Bhatia - Senior Technician; Jim Rasmus - Permitting/Stormwater; Bronwyn Kelly - Stormwater Studies

Carollo was retained by the City in 2016 to provide a broad range of as-needed engineering services, including:

Demonstration Pure Water Facility Ozone and BAC Relocation. This project provided preliminary and final design for relation of the BAC and ozone systems. Additionally, this project will evaluate the use of the 24-inch NCPWF blending line to provide backwash water for the BAC and identify backwash waste flows, equalization needs, and point of return within the NCWRP.

Stormwater Recovery Feasibility Study. The purpose of this study was to evaluate the feasibility of capturing a greater volume of stormwater for diversion to the existing sewer system for use as an additional water supply for the Pure Water San Diego Program. This conceptual-level study provided an estimate of the potential amount of captured stormwater and identified improvements for diversion to the City's sewer collection and treatment system. Recommendations for more detailed evaluations were provided.

NCREP Landfill Gas Pipeline Rose Canyon Undercrossing Project. Carollo provided services to the City including additional seismic refraction fieldwork, utility locating field services, attendance of a 30 percent design review meeting with the City's program management team, and additional scope and budget for future services.

Develop Standard Operating Procedures for Maintenance of Water Operational Facilities. With the implementation of IAMSanDiego, the City contracted Carollo to develop of SOPs for maintenance: pump stations, pressure regulating stations, reservoirs/standpipes, and altitude valves.

South Bay Water Reclamation Plant Stormwater Capture Study. The City requested Carollo to provide a study to determine the feasibility and cost to capture and treat all or some of the stormwater. Stormwater flows would be introduced into the SBWRP process at the plant influent and would be eventually discharged via the ocean outfall after treatment or developed into recycled water.

Water System Operations System-Wide SCADA Upgrade Phase 1. The overall objective of this task order is to develop a Project Delivery Plan that defines the various technical objectives and phases of the SCADA Upgrade Project, as well as the relative timing and estimated costs of the various project phases.

Alvarado Water Treatment Plant Chlorine Compliance Audit. Carollo was contracted to review the previously developed audit checklist, based on EPA's document titled Guidance for Auditing Risk Management Plans/Programs, conduct a compliance audit for the existing chlorine process, and prepare a written compliance audit report.

Miramar WTP Chlorine Compliance Audit. Carollo was contracted to conduct a compliance audit for the existing chlorine process. Carollo will provide a written audit compliance report.

As-Needed Engineering Services

COUNTY OF SAN DIEGO, CALIFORNIA

REFERENCE

Ted Kautzman, Senior Civil Engineer
858-694-2919 | ted.kautzman@sdcounty.ca.gov

TEAM MEMBER INVOLVEMENT

Andrew Frost - Task Order (TO) Manager; Jeff Thornbury - Program Manager; Jeff Weishaar - TO Manager; Jim Rasmus - TO Manager; Miko Aivazian - Civil; Justin Mercer - Civil; James Doering - Structural; Troy Hedlund - Electrical

Carollo currently serves as one of the on-call consultants for the County of San Diego in water/wastewater engineering and has been involved in several task orders related to sewer line replacement, rehabilitation, planning, preliminary design, and final design. These projects are of critical importance to the County and make up large portions of their annual Capital Improvement Programs.

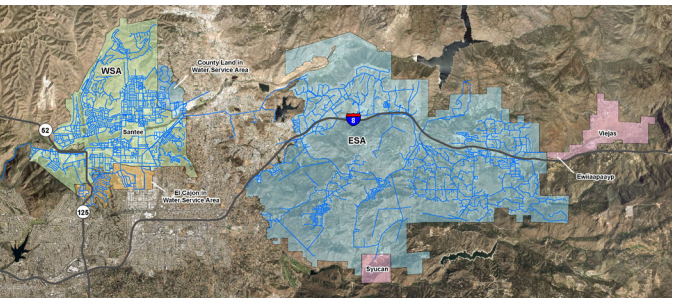
Los Coches Streambed Stabilization and Sewer Protection. Carollo completed the preliminary and final design for the rehabilitation and protection of 7,200 feet of 8 to 15-inch sewer running throughout the Los Coches Creek in east county San Diego. Rehabilitation of the pipeline was done through a cured in place pipe (CIPP) liner system that was installed along the entire run of the pipeline within the project limits. Services included final improvement plans, sewer bypass plans, and detailed access plans outlining impacts to surrounding private property owners, specifications, and construction estimate. In addition to the sewer improvements, this project installed long term improvements including articulated concrete blocks and rip rap within the channel to ensure the integrity of the collection system during rain events.

Countywide Manhole Improvements FY 2018-2022. Carollo completed four separate bid packages for Countywide manhole improvements throughout the collection system. These projects rehabilitated or replaced over 100 manholes, and included analysis of CCTV and MACP inspection reports, verification of structural and operational based scoring, and identification of the best fit improvement or replacement method. Existing conditions in the system ranged from minor exposed aggregate, peeling liners, and corroded covers to large cracks, root intrusion, and exposed rebar. Selected improvements included manhole replacement, spray on epoxy liners, and polymer concrete inserts. The project also replaced the frame and cover on each manhole with a corrosion resistant, composite manhole cover that will allow for easy access to the system and service life beyond 30 years.

San Diego River Basin Sewer. Carollo is completing a preliminary design report to rehabilitate and replace 15,000 feet of techite and vitrified clay pipeline along the San Diego River. Project includes analysis of the trunk sewer line including realignments, trenchless construction, above grade stream crossings and manhole improvements. Special considerations were paid to options that will move the pipeline out of private easements and into public right of way, as well as options to improve access to the overall pipeline and improve the operation of the system. This work included analysis of CCTV data, pipeline and manhole inspection reports, as built record drawings and site verified conditions.

As-Needed Engineering Services

PADRE DAM MUNICIPAL WATER DISTRICT, CALIFORNIA



REFERENCE
Mark Niemiec, Manager of District Projects
619-258-4766 | mniemiec@padre.org

TEAM MEMBER INVOLVEMENT
Jeff Thornbury - Principal-in-Charge; Jeff Weishaar - TO Manager

Carollo was retained by Padre Dam Municipal Water District in 2014 to provide a broad range of as-needed engineering services, which includes the following:

- Hydraulic modeling and analysis of proposed water or recycled water distribution systems, and sewage collection systems.
- Pump station/sewer lift station design.
- Reservoir design.
- Pipeline design (water/wastewater/recycled water).
- Engineering support services during construction including reviewing the contractor's material submittals, responding to RFIs, reviewing the contractor's change order requests, and pump station start up assistance.
- Condition assessment services for existing water/wastewater/recycled water facilities and pipelines.
- Mapping, computer-aided drafting, and geographic information systems.
- Special studies for water/wastewater/recycled water projects, including wastewater characterization studies, pump energy assessments, feasibility studies, risk analysis, value engineering studies, development-specific sub-area master plans, water supply assessment studies satisfying SB 610 and SB 221, and fee and structure studies.
- Cost estimation.
- Electrical and instrumentation design.
- Plan check of developer-submitted design drawings.

Qualifications of the Firm

FIRM CAPABILITIES

Carollo's Contribution to Your Success

Our work with the San Elijo Joint Powers Authority (San Elijo) dates back nearly 20 years beginning with the original Facilities Master Plan for the San Elijo Water Reclamation Facility (SEWRF). Carollo assisted San Elijo in updating the Facility Master Plan in 2015, and San Elijo is currently embarking on Phase 2 of the capital program implemented through the master plan. More recently Carollo has assisted in SCADA updates at the SEWRF and the remote pump stations.

Having knowledge and understanding of your facilities through these projects, we know only too well the importance of delivering successful individual projects for your overall system operation. Carollo's team will deliver the most cost-effective solution to each Task Order, no matter what the size.

Demonstrated Familiarity and Experience with Wastewater and Recycled Water Systems

The following pages include a sampling of our demonstrated capability to deliver similar services on related projects in the areas of engineering, planning/modeling, and construction management.

Wastewater Treatment

Carollo is a national recognized leader in the field of wastewater treatment project development, planning, and design. Over the past 87 years we have managed the development, planning, design, and construction of more than 300 wastewater treatment facilities in the United States alone. Our proposed staff has prepared preliminary and detailed designs for over 50 wastewater treatment plants in Southern California ranging in capacity from small plants of 0.5 mgd to large ones of up to 300 mgd. The following table illustrates related projects that we have worked on in the past ten years.

REPRESENTATIVE WASTEWATER TREATMENT PROJECTS	
Orange County Sanitation District, CA – Plant No. 1 Headworks Rehabilitation and Expansion	Eastern Municipal Water District, CA – Temecula Valley, San Jacinto Valley, and Moreno Valley RWRFs
Orange County Sanitation District, CA – Plant No. 2 Expansion	Hi-Desert Water District, CA – WRF
San Bernardino MWD, CA – San Bernardino Water Reclamation Plant (11 projects)	West County Wastewater District, CA – Recycled Water Reliability Upgrades and Misc Mechanical & Electrical Improvements
City of Riverside, CA – Riverside Water Quality Control Plant	City of San Clemente, CA – San Clemente WRP
Encina Wastewater Authority, CA – Encina Water Pollution Control Facility Phase IV Expansion	Inland Empire Utilities Agency, CA – Chino Hills Expansion/ Modifications RFP-5
City of Oceanside, CA – San Luis Rey WRP	City of Los Angeles, CA – Hyperion Treatment Plant
Eastern Municipal Water District, CA – Perris Valley Regional Water Reclamation Facility (RWRF) Plant 3 Expansion	City of Modesto, CA – Jennings Road Wastewater Treatment Plant
City of Redlands, CA – Recycled Water Treatment Facility	City of Santa Barbara, CA – El Estero Wastewater Treatment Plant

Wastewater Pipelines and Pump Stations

Carollo provides complete planning, design, condition assessment, rehabilitation design, program management, and construction services for collection systems, interceptors, force mains, and sewer lift stations. Throughout our 87-year history, Carollo has worked with cities, public agencies, and community groups on more than 2,000 wastewater infrastructure projects. We have provided engineering services for more than 20 million linear feet of sewer pipeline and more than 2 million linear feet of sewer pipeline design/rehabilitation in the last 10 years.

Carollo has planned, designed, and/or assisted in the construction of more than 500 wastewater lift/pump stations ranging in size from 1 mgd to 650 mgd, with up to 3,000 hp. We have designed gravity and force main sewer lines ranging from 8 inches to 134 inches in diameter, with pressures up to 600 psi. Carollo's nationwide condition assessment and rehabilitation projects include more than $200 million in construction fees. A sampling of our wastewater infrastructure projects in provided in the tables below.

WASTEWATER PIPELINE PROJECTS	LENGTH (FT)	DIAMETER (IN)
County Sanitation Districts of Los Angeles County, CA – Joint Outfall "A" Relief Sewer	42,000	54-90
County Sanitation Districts of Los Angeles County, CA – Trunk Relief Interceptor Project	36,000	48-102
Orange County Sanitation District, CA – On-Shore Portion of Ocean Outfall	3,000	120
Orange County Sanitation District, CA – Interplant Interceptor	18,300	120
Central Contra Costa Sanitary District, CA – A-Line Relief Interceptor	29,800	60
East Bay Municipal Utility District, CA – Adeline Street/South Foothill Interceptors	32,000	42-84
East Bay Municipal Utility District, CA – North Interceptor Relocation	3,400	60-105
Sacramento Regional County Sanitation District, CA – Bradshaw Interceptor Section 3	5,320	90
Clark County Water Reclamation District, NV – Paradise Whitney Interceptor	26,600	54-66

WASTEWATER PUMP STATION PROJECTS	CAPACITY (MGD)
Sacramento Area Flood Control Agency, CA – Natomas Pump Station	646
Orange County Sanitation District, CA – Ocean Outfall Booster Pump Station	600
Orange County Sanitation District, CA – Headworks C/Plant No. 2 & Headworks B/Plant No. 2	288; 160
Orange County Sanitation District, CA – Headworks 2/Plant No. 1	280
City of Portland, OR – Columbia Boulevard Wastewater Treatment Plant Pump Station	300
City of Portland, OR – Swan Island CSO Pump Station	220
Central Contra Costa Sanitary District, CA – Orinda/Moraga Pump Station	124
King County, Seattle, WA – Matthews Park Pump Station	120
East Bay Municipal Utility District, CA – Point Isabel Pump Station	100
City of San Bernardino, CA – Influent Pump Station	90
East Bay Municipal Utility District, CA – Storage Basin Pump Station	80
City of Watsonville, CA – Pajaro River Pump Station	65
Elsinore Valley Municipal Water District, CA – Diamond Regional Sewer Lift Station and Dual Force Mains	19.9

Master Planning and Modeling

Carollo offers a full range of water, wastewater, and recycled system planning, treatment plant evaluation, and treatment pilot study services. We have demonstrated our ability to successfully simplify complex technical, legal, regulatory, and institutional issues to produce clear, concise, cost-effective, and implementable recommendations. Master planning has been an integral aspect of Carollo's experience for more than six decades. Many of our long-term client relationships began with long-range planning projects. Projects range from small planning studies to comprehensive regional master plans. These plans have addressed process and collection system reliability, flexibility, and operational issues. Our professionals provide cost-effective solutions which utilize existing facilities to the greatest extent possible and limit treatment alternatives and capital expenditures to the most reliable and easy to implement options. In the last 10 years alone, Carollo has completed master plans for $8.2 billion in wastewater facilities.

Carollo has completed more master plans in California than any other firm.

RECYCLED WATER AND WASTEWATER MASTER PLANNING PROJECTS
Padre Dam Municipal Water District, CA – Comprehensive Facilities Master Plan
City of Carlsbad, CA – 2010 Recycled Water Master Plan and Recycled Water Phase II Feasibility Study
City of El Centro, CA – Sewer, Water, and Storm Drainage Master Plans
Otay Water District, CA – Integrated Water Resources Plan
Sweetwater Authority, CA – Recycled Water Master Plan
San Elijo Joint Powers Authority, CA – San Elijo Water Reclamation Facility Master Plan
Encina Wastewater Authority, CA – Plant Process Master Plan
City of South Pasadena, CA – 2020 Integrated Master Plan
City of Riverside, CA – Update to the Integrated Master Plan for Wastewater Collection and Treatment Facilities
City of Oceanside, CA – Water, Wastewater, and Recycled Water Master Plans
Elsinore Valley Municipal Water District, CA – Wastewater Master Plan and Sanitary Sewer Management Plan
City of Banning, CA – Sewer and Recycled Water Systems Master Plans and Water Master Plan Review
City of Glendale, CA – Water and Recycled Water Master Plan
Inland Empire Utilities Agency, CA – On-Call Recycled Water Modeling
Inland Empire Utilities Agency, CA – Wastewater Master Plan
City of Los Angeles, CA – One Water LA 2040 Plan
City of Hesperia, CA – Water, Wastewater, and Recycled Water Master Plans
West Basin Municipal Water District, CA – Recycled Water Master Plan
City of Riverside, CA – Integrated Water Management Plan

Construction Management

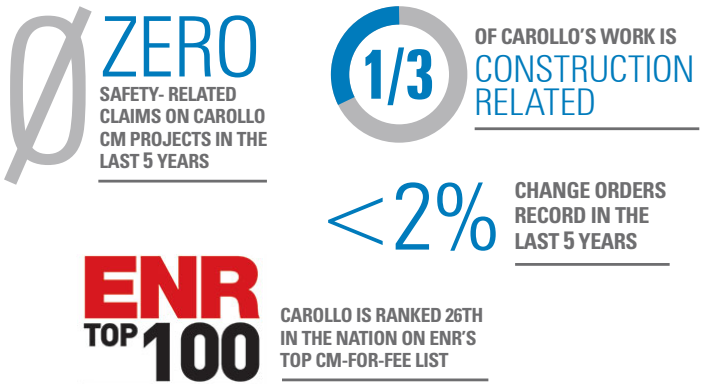
Carollo has provided construction management (CM) services for hundreds of wastewater and water facilities throughout the United States, and is consistently ranked within ENR's top 50 CM-for-Fee firms. We have provided CM and inspection services for more than $3 billion in wastewater and water treatment facilities over the last 10 years, both as the design engineer (engineering services during construction) and as a third-party construction manager.

More than one-third of Carollo's annual revenues are attributable to construction-related services. We recruit nationwide and hire technical staff that have extensive background and training specific to this field. For that reason, the quality and professional standing of Carollo's core water and wastewater CM group is equivalent to or exceeds that provided by some of the largest CM firms in the country. This is especially true in California, where Carollo is regarded as one of the most prominent water and wastewater engineering/CM firms.

Our staff includes construction managers, resident engineers, schedulers, document management specialists, estimators, and resident and specialty inspectors. Our construction managers and resident engineers are experienced in both the design and construction of wastewater treatment facilities.

This benefits our clients because our staff knows what to look for and how to prevent problems before they occur. They add value each time they handle a document—applying lessons learned as specialists in wastewater engineering.

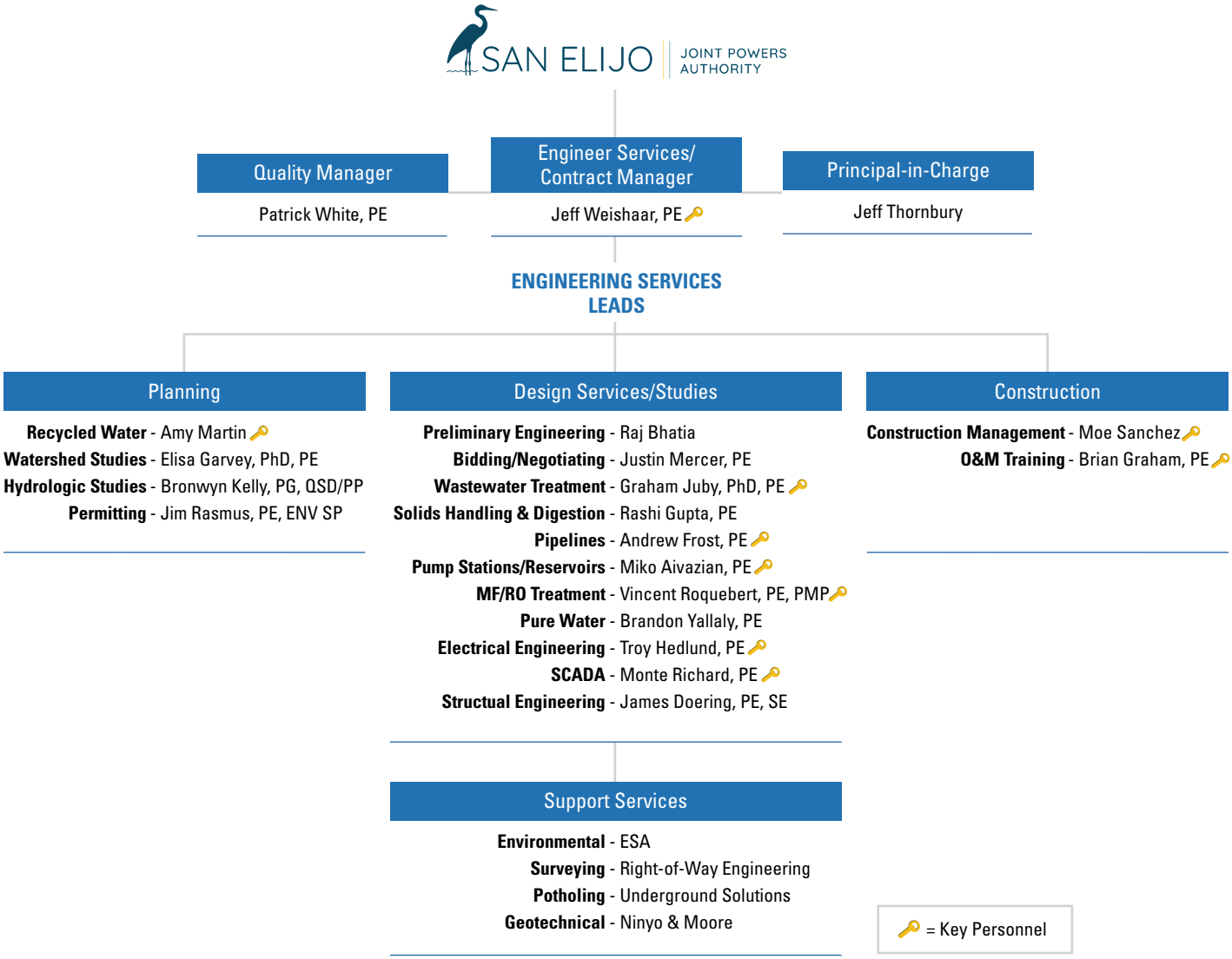
Carollo also provides professional training and development of our staff in the ever-changing areas of safety, risk management, and claims consulting. Our resources include full computerized document tracking and scheduling capabilities. Carollo's track record in preventing and mitigating claims is excellent. In addition to offering experienced construction managers and resident engineers as a first line of defense against claims, Carollo's claims avoidance methods include constructability reviews, schedule management, partnering, disputes review boards, and the timely handling of all documents and requests.



REPRESENTATIVE CONSTRUCTION MANAGEMENT PROJECTS
City of Oxnard, CA – Reclaimed Water Phase 1 Pipeline Project ($10 million)
City of Oceanside, CA – San Luis Rey Wastewater Treatment Plant Interim Expansion ($55.5 million)
Eastern Municipal Water District, CA – Perris Valley RWRF Expansion ($149 million)
Eastern Municipal Water District, CA – Moreno Valley RWRF Preliminary Treatment and Acid-Phase Anaerobic Digestion ($31 million)
City of Riverside, CA – Regional Water Quality Control Plant Expansion ($200 million)
City of Benicia, CA – Wastewater Treatment Plant Improvements ($23 million)
Monterey Regional Water Pollution Control Agency, CA – Salinas Valley Reclamation Project ($25 million)
City of San Bernardino, CA – Primary Hydraulic Reliability Project ($67 million)
City of Santa Cruz, CA – Secondary Upgrade Construction Management ($50 million)
Western Riverside County Regional Wastewater Authority, CA – Regional Water Reclamation Facility ($24 million)
City of Sunnyvale, CA – Water Pollution Control Plant ($12.5 million)
Orange County Water District, CA – GWRS Final Expansion Third-Party Construction Management ($188 million)

Organization Chart

Our organizational chart introduces our entire project team and identifies communication and functional and reporting responsibilities. On the pages that follow, we describe our approach to managing on-call projects.



TASK MANAGEMENT PLAN

This section provides an overview of Carollo's technical and management approach to San Elijo's On-Call Engineering Services contract. Our entire approach for working with you on this contract is based upon responsiveness to your task order requests, meeting deadlines, strong project management, and quality engineering services.

Foremost in achieving these goals is to provide you with a single point of contact throughout the duration of this contract. Jeff Weishaar, our proposed contract manager, will serve in this role. Jeff and his management team will use the following methods to achieve exceptional delivery and service on all task orders.

Task Order Initiation

Upon receipt of San Elijo's task order proposal, Jeff will select the appropriate task order manager and delineate resource goals for the assignment. Following a meeting with San Elijo, this selected team will help prepare the task order budget and schedule to achieve the task order goals. Depending on the size and complexity of the task order, Jeff will work with San Elijo's project manager to determine how extensive the initial scoping meeting needs to be. Once a Notice-to-Proceed (NTP) has been issued for the task order, Jeff and the task order manager will assume the responsibility to direct the team and deliver the work products.

Controlling Costs and Schedule through State-of-the-Art Software

From the beginning of each task order, Carollo understands the importance of cost and schedule control. We also understand that cost control begins from the first day of the task order in order to make sure costs stay within the approved budget. Our level of cost control oversight will vary depending on the size of the task order, but, in summary, we will use every measure possible to control and limit costs at the planning, engineering design, construction, and operations levels.

Engineering Costs. During the initial start-up of each task order, the Carollo management team will develop a schedule for each Work Breakdown Structure (WBS) task and assign person-by-person cost allocation to each. This will relate to a detailed scope of work and will form the basic part of a Project Management Plan (PMP) to be executed by the task order manager and support team. The PMP will identify individuals, their start and finish times, and expected work products. Frequent review of costs incurred on the task order by the task order manager and Jeff offers the best method of controlling costs and maintaining performance within budget.

On a weekly basis, our task order managers will review all project labor and direct costs associated with their projects via an electronic network. This weekly review allows the task order managers to determine if costs are in line with expectations and take actions if needed. On a monthly basis, the cost budget and schedule for each task order will be reviewed by the project manager, Jeff, and the task order manager.

All Carollo task order managers are required to prepare integrated schedule and budget monitoring data for their projects indicating budgeted costs, actual costs, percent complete, and earned value on a monthly basis. This data is prepared and monitored using a web-based application. This program is used not only at the local office level to manage costs associated with current projects, but also at the corporate level by senior company managers to monitor our key clients and projects. At Carollo, cost control at the design level is taken very seriously…achieving a "cost-overrun" percentage of less than one percent of our total project fees at the local San Diego office level is proof of our success.

Construction Costs. Adequate control of project costs is started at the planning and design phases of a project. The highest impact on construction costs is usually exerted during the earliest phases of a project.

Control of scope on individual projects has historically been difficult for engineering firms because of an inherent desire to provide the best possible services and products to their clients. As design work progresses, engineers, operators, and maintenance personnel continue to develop additional ideas for design enhancements, often leading to increased construction costs. When taken as a whole, the sum total of these design enhancements can be significant. The development of a project initiation/change system serves to control project scope by identifying the baseline used for budget and scheduling. By doing so, costs and schedule impacts on other projects can by identified and communicated to San Elijo at the time of project initiation or change. At this point, a decision as to the cost-effectiveness of allowing the change requested can then be made and unnecessary re-design work avoided. A partnering approach between San Elijo and Carollo's management team can be used to preserve budgets and reduce unnecessary changes.

The key to this cost control program is the prompt identification of design changes and the qualification of their impact on overall project budget. The Carollo team will recommend that an overall project construction cost estimate for each task order be prepared at predesign, 50-percent, and 90-percent design levels. We have used this "cost-trending" approach with great success on other task-order based contracts throughout California with great success.

Operational Costs. In many water and wastewater facilities, engineering and capital costs are only a small portion of the total life-cycle costs. Traditional low-bid public works procurement, however, does not always account for the future costs of electricity, chemicals, and manpower. Carollo brings a strong team of experts in this area to San Elijo, and, where appropriate, can recommend a life-cycle cost configuration for equipment selection. For example, in selecting new blower equipment, a procurement specification may be prepared that specifies performance requirements, a range of operating conditions, and the amount of time each of the operations will occur. The competitive procurement process, then, will account for the purchase price of the blower and San Elijo's long-term cost of power for the blowers.

MAINTAINING LINES OF COMMUNICATION FOR SUCCESS

Carollo will provide continuous communication with San Elijo's contract and project managers to make sure we are doing the right thing. At the onset of the contract, we will establish clearly defined roles, responsibilities, and reporting requirements that are consistent with the contract and scope of each task order. We will develop a dynamic, flexible, and manageable project scoping matrix to make sure that all ideas are considered, and the best project scope is developed.

Jeff is less than a 20-minute drive to San Elijo's offices and is fully committed to staying in contact with your staff. He will also make sure that each Carollo task order manager is physically available to meet with San Elijo staff at any time to discuss the project's development. We will produce a list of key personnel and contact numbers for each task order that will be given to San Elijo. The ultimate goal of maintaining lines of communication is to keep tasks on schedule and within established budgets.

Our team brings a detailed knowledge and an extensive network of contacts within San Elijo JPA for working with other departments and obtaining important information necessary to move tasks forward. We know who to contact, and we know what they need.

QUALITY MANAGEMENT AND CONTROL

Carollo's quality management is based on our understanding of the of project requirements and standards based on our extensive experience providing engineering services. Simply put, Carollo's Quality Management Program is based on the concept of continually improving quality by identifying and correcting problems so that they do not reoccur. This helps eliminate inefficiency, reduce inconsistency, and increase overall performance. Our Quality Management Program is dynamic—it is continually evolving to improve training, minimize variability, and maximize client satisfaction with our work products.

Specifically, our quality management process consists of eight specific phases of peer review, checking, and interdisciplinary coordination. Each phase has specific deliverables, a log of review comments, a record of changes made, and supporting documentation. Our proven process has resulted in a consistent track record of low change orders—less than two percent over the past 10 years—a benchmark that is significantly lower than industry averages.

This process aligns well with San Elijo's requirements and standards, as we strive to apply the right reviews at the right time to make sure your project begins and ends successfully. We define quality management success if, at the end of the project, we have satisfied our three indicators of successful quality management:

1. **We have minimized errors and omissions in all work products.**
2. **We have controlled design and construction costs by "doing it right the first time."**
3. **We strive to maintain the project schedule and budget through efficient project delivery.**

With the tools, processes, procedures, and personnel we have in place to manage quality, we are confident in our ability to meet these indicators on all your task orders.

TOTAL QUALITY MANAGEMENT FROM START TO FINISH

Our approach will focus on quality throughout all phases of each task order to deliver projects that are correct, on time, on budget, achieve the scope, and meet or exceed your expectations.

References

As requested in the RFQ, we have provided client references specific to each of our ten key team members in the table below.

KEY TEAM MEMBER	REFERENCE 1	REFERENCE 2
Jeff Weishaar	Jason Dafforn, Director of Engineering & Water Resources Elsinore Valley Municipal Water District 31315 Chaney Street, Lake Elsinore, CA 92530 **P:** 951-674-3146 x8219 | **E:** jdafforn@evmwd.net	Scott McClelland, Assistant General Manager Encina Wastewater Authority 6200 Avenida Encinas, Carlsbad, CA 92011 **P:** 619-929-9977 | **E:** smcclelland@encinajpa.com
Amy Martin	Praseetha Krishnan, Water Resources & Planning Manager Cucamonga Valley Water District 10440 Ashford Street, Rancho Cucamonga, CA 91730 **P:** 909-987-2591 x7313 | **E:** PraseethaK@cvwdwater.com	Luis Cardenas, Senior Civil Engineer City of Banning 99 East Ramsey St, Banning, CA 92220 **P:** 951-922-3143 | **E:** lcardenas@banningca.gov
Graham Juby	Erik Jorgensen, Principal Civil Engineer Eastern Municipal Water District 2270 Trumble Road, Perris, CA 92570 **P:** 951-928-3777 x4471 | **E:** jorgense@emwd.org	Ernest Marquez, Jr., Principal Engineer City of Riverside - Public Works 5950 Acorn Street, Riverside, CA 92504 **P:** 951-826-5409 | **E:** emarquez@riversideca.gov
Andrew Frost	Tony Culver, Assistant General Manager, Operations Hi-Desert Water District 55439 29 Palms Highway, Yucca Valley, CA 92284 **P:** 760-365-8333 | **E:** tonyc@hdwd.com	Ted Kautzman, Senior Engineer County of San Diego, Wastewater Management 5500 Overland Ave, Suite 315, San Diego, CA 92124 **P:** 858-694-2919 | **E:** ted.kautzman@sdcounty.ca.gov
Miko Aivazian	Shawnele Morelos, Principal Engineer – Capital Projects Elsinore Valley Municipal Water District 31315 Chaney Street, Lake Elsinore, CA 92530 **P:** 951-674-3146 x8320 | **E:** smorelos@evmwd.net	Ron Palacios, Senior Engineer Western Municipal Water District 14205 Meridian Parkway, Riverside, CA 92518 **P:** 951-571-7124 | **E:** rpalacios@wmwd.com
Vincent Roquebert	Tom O'Neill, General Manager/CEO Chino Basin Desalter Authority 3550 E Philadelphia Avenue, Suite 170, Ontario, CA 91761 **P:** 951-377-2232 | **E:** toneill@chinodesalter.org	Phil Lancaster, Water Operations Manager Eastern Municipal Water District 2270 Trumble Road, Perris, CA 92572 **P:** 951-928-3777 x7303 | **E:** lancastp@emwd.org
Troy Hedlund	Marissa Potter, Associate Civil Engineer Santa Fe Irrigation District 5920 Linea Del Cielo, Rancho Santa Fe, CA 92067 **P:** 858-227-5792 | **E:** mpotter@sfidwater.org	Martin Wilder, Civil Engineer Manager Laguna County Sanitation District, County of Santa Barbara Public Works Department 620 West Foster Road, Santa Maria, CA 93455 **P:** 805-803-8755 | **E:** mwilder@cosbpw.net
Monte Richard	Glenn A. Knapp, Engineer City of Fresno, Department of Public Utilities 2101 G Street, Building A, Fresno, CA 93706 **P:** 559-621-1624 | **E:** glenn.knapp@fresno.gov	Matt Garrison, Facilities Electrical Engineer III Kern County Water Agency 3200 Rio Mirada Drive, Bakersfield, CA 93308 **P:** 661.331.4667 | **E:** mgarrison@kcwa.com
Moe Sanchez	Scott McClelland, Assistant General Manager Encina Wastewater Authority 6200 Avenida Encinas, Carlsbad, CA 92011 **P:** 619-929-9977 | **E:** smcclelland@encinajpa.com	Glenn A. Knapp, Engineer City of Fresno, Department of Public Utilities 2101 G Street, Building A, Fresno, CA 93706 **P:** 559-621-1624 | **E:** glenn.knapp@fresno.gov
Brian Graham	Mike Konicke, Associate Engineer San Elijo Joint Powers Authority 2695 Manchester Avenue, Cardiff, CA 92007 **P:** 760-753-6203 | **E:** konickem@sejpa.org	Mike Thornton, General Manager San Elijo Joint Powers Authority 2695 Manchester Avenue, Cardiff, CA 92007 **P:** 760-753-6203 | **E:** thornton@sejpa.org

Contract Issues

Carollo has reviewed the Standard Professional Services Agreement provided in the RFQ and takes no exceptions.

Rates

CAROLLO ENGINEERS, INC.

FEE SCHEDULE

As of January 1, 2020 | California

	Hourly Rate
Engineers/Scientists	
Assistant Professional	$170.00
Professional	$210.00
Project Professional	$235.00
Lead Project Professional	$265.00
Senior Professional	$295.00
Technicians	
Technicians	$138.00
Senior Technicians	$175.00
Support Staff	
Document Processing/Clerical	$125.00
Project Equipment Communication Expense (PECE) Per DL Hour	**$13.00**

Other Direct Expenses	
Travel and Subsistence	At Cost
Mileage at IRS Reimbursement Rate Effective January 1, 2020 $.575 per mile	
Subconsultant	Cost + 10%
Other Direct Cost	Cost + 10%

This fee schedule is subject to annual revisions due to labor adjustments.

Appendix

- Resumes

Education

MS Environmental Engineering, University of Missouri, Rolla, 2006

BS Civil Engineering, University of Missouri, Rolla, 2004

Licenses

Civil Engineer, California

Professional Affiliations

American Society of Civil Engineers

Society of American Military Engineers

Water Environment Federation

Jeffrey A. Weishaar, P.E.

Jeffrey A. Weishaar, a civil and environmental engineer with Carollo, has worked on various wastewater projects, including elements of analysis, design, and construction. He has had a leadership role in the design of projects involving nearly all aspects of water/wastewater treatment processes and facilities, including conveyance system design and comprehensive wastewater treatment plant improvements. Jeff has completed multiple rehabilitation projects throughout California for various clients.

Relevant Experience

→ Program manager for the Elsinore Valley Municipal Water District, California, Regional WRF Program Management project. The project included administration building rehabilitation – office/laboratory/staff breakroom/storage room.

→ Project manager for the Water Reclamation Plant Expansion for the City of San Clemente, California. The preliminary and final design project will increase plant recycled water production capacity from 2.2 to 4.4 mgd. Preliminary design responsibilities included process evaluation of disinfection processes and flow balancing to evaluate on-site storage of secondary effluent prior to tertiary treatment. Final design responsibilities included civil and yard piping, mechanical and process design for drawing production, specification preparation, and cost estimating.

→ Project manager for the Encina Wastewater Authority, California, Solids Thickening Project for the Encina Water Pollution Control Facility.

→ Project engineer for the El Estero Wastewater Treatment Plant Screening Evaluation for the City of Santa Barbara, California. The project evaluated screening technologies to replace the existing grinder and auger system at the influent pump station facility. Over a dozen screens were evaluated to fit into a high-flow, low-head loss environment with limited installation requirements. Use of multi-rake climber screens, over 20 feet in height, was recommended to remove debris from the incoming flow. The recommendations came after extensive evaluations including interviews of existing facilities that have the screens in service.

→ Project engineer for the Water Reclamation Plant Headworks Upgrades for the City of San Clemente, California. The design included drawings and contract documents for concrete repair and relining of the headworks influent channels and grit basins and replacement of mechanical bar screens. Relining of channels required design of a temporary bypass facility, including manual bar screens and odor control, with focus on the contractor's responsibility to maintain and operate the facility. He provided construction management services, submittal review, and responses to contractor requests for information.

→ Project engineer for the City of Barstow, California. Wastewater Treatment Plant Improvements Phase 1 Project. This project covered multiple subtasks including condition assessment of the wastewater treatment plant, project development and ranking, process modeling, preliminary design and final design. The Phase 1 construction project includes rehabilitation of the aeration basins, secondary clarifiers, and gravity thickener, as well as SCADA upgrades, a new dewatering facility and new standby generator and additional miscellaneous site piping, electrical and instrumentation upgrades. The Phase 2 construction project will include upgrades to the primary clarifiers and aerobic digesters as well as a new influent pump station, a new electrical control building and additional SCADA, electrical, and instrumentation upgrades.

→ Project engineer for the Regional Treatment Plant Headworks Upgrade for the South Orange County Wastewater Authority, California. The project involved production of drawings and contract documents for replacement of the headworks building roof; rehabilitation of the existing mechanical bar screens; installation of new conveyors, screenings dewatering equipment, level measurement equipment in the existing channels for bar screen controls, and gas

analyzers; channel concrete repair; odor control; and electrical and instrumentation modifications and upgrades. Roof replacement also incorporated a temporary odor control system with focus on the contractor's responsibility in capturing odors. He provided construction management services, submittal review, and responses to contractor requests for information.

→ Project engineer for the San Luis Rey Water Reclamation Plant for the City of Oceanside, California. The preliminary and final design project will increase plant recycled water production capacity from less than 0.5 to 1.5 mgd and includes master planning to an ultimate capacity of 7.5 mgd. Specific responsibilities included process evaluation and life-cycle cost analysis for tertiary and disinfection processes during preliminary design. Final design responsibilities included civil work, yard piping, mechanical and process design for drawing production, specification preparation, and cost estimating.

→ Project engineer for design of a new wastewater lift station at Lake Cachuma Park for the County of Santa Barbara, California. The station incorporates chopper pumps in a wet well designed to prevent solids deposition. He provided construction management services, submittal review, and responses to contractor requests for information.

→ Project manager for the Encina Wastewater Authority, California, Process Master Plan for the Encina Water Pollution Control Facility.

→ Project engineer for the La Salina Wastewater Treatment Plant Asset Valuation Study for the City of Oceanside, California. His responsibilities included preparation of replacement, less depreciated cost values, for the 5.5-mgd treatment plant.

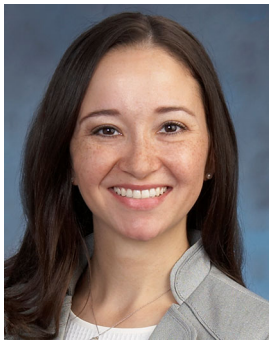
→ Condition assessment task leader for the City of Colton, California, Wastewater Master Plan. Responsibilities included leading a team of discipline engineers to assess the City's wastewater treatment plant facility.

→ Condition assessment task leader for the City of Oceanside, California, 2013 Integrated Mater Plan update. The task entailed condition assessment of the City's 32 sewer lift stations. Replacement and rehabilitation projects were identified and prioritized for use in the City's CIP.

→ Staff engineer for the Sewer Master Plan for the City of El Centro, California. The project used H_2OMAP Sewer® modeling software to identify potential improvement needs for the sewer collection system, including pipes, manholes, and pump stations. Models were based on existing demand and analyzed for existing and future supply and demand.

→ Project manager for the Coastal Treatment Plant Export Sludge Equalization Basin Design-Build Project for the South Orange County Wastewater Authority, California. The project included preliminary design of a sludge holding tank, export pumping station, and electrical building for storage and pumping of the Coastal Plant's primary and thickened sludges. The sludges are pumped approximately 4 miles to a nearby facility for processing. Preparation of the design-build procurement package included development of plans and specifications to a 60-percent completion level, preparation of the design-build agreement, agreement forms, and the request for proposals. Bids were received and evaluated from multiple design-build teams. Carollo is currently operating as the Owner's representative in overseeing the final design and construction and providing inspection services.

→ Project engineer for the J.B. Latham Wastewater Treatment Plant Digester 3 Repairs for the South Orange County Wastewater Authority, California. The project included delivery of a preliminary design report analyzing the necessary repairs to the digester's mechanical appurtenances and instrumentation to improve safety and operations reliability. Drawings and specifications were prepared for concrete repair and recoating, piping and valve modifications, and instrumentation upgrades.



Education

BS Civil Engineering, California State Polytechnic University, Pomona, 2007

Professional Affiliations

WateReuse Association

Water Environment Federation

Amy N. Martin

Amy Martin joined Carollo in May 2014 as a lead planner. She has more than 14 years of engineering project management experience at a leading public agency in Southern California. She has managed large-scale recycled water infrastructure projects, feasibility reviews, database development projects, and coordinated with multiple owners and agencies. Her technical experience also includes recycled water infrastructure, wells, wastewater treatment plants, construction management, cost estimating, and permitting.

Relevant Experience

→ Project manager and planning lead for the Phase 1 (2016) and Phase 2 (2018) Recycled Water Feasibility Study to increase the region's water supply with the sustainable and reliable use of recycled water. Interconnection between the City of Pomona, Monte Vista Water District, and Inland Empire Utilities Agency were evaluated to develop water supply alternatives that would provide IEUA with regional water supply benefits. As part of this evaluation, seasonal flow data from multiple supply sources with variable water quality was analyzed, regulatory permit impacts were reviewed, groundwater impacts were evaluated, and advanced treatment alternatives were assessed. The final selected alternatives were analyzed utilizing InfoWater models from the City of Pomona and IEUA. Upon completion of the Phase 1 and Phase 2 studies, a Title XVI grant report was submitted to USBR to obtain project funding.

→ Project engineer for the 2015 recycled water feasibility study for Indio Water Authority, California. This project involved the preparation of a feasibility that conformed to the Bureau of Reclamation's Title XVI requirements, which would be utilized to obtain project authorization for future grant funding opportunities. As part of this study, project alternatives from the 2009 recycled water mater plan were refined, cost estimates were prepared, and a proposed project schedule was developed.

→ Project planning lead for the 2014 Water Resource Management Measures and Reconnaissance Study for Castaic Lake Water Agency, California. This project includes groundwater basin modeling performed by GSI Water Solutions, Inc. and the development of concepts that evaluate the utilization of local water supplies to augment the Santa Clarita Valley water supply portfolio. Concepts reviewed include pumping redistribution, groundwater recharge with recycled water, enhanced stormwater capture and aquifer storage and recovery (ASR).

→ Water demand and flow forecasting task lead for the City of Los Angeles, California, One Water LA 2040 Plan. The Plan is a collaborative effort of the LA Sanitation (LASAN) and LA Department of Water and Power (LADWP) that takes a holistic approach to consider all types of water as "One Water." The Plan is developed through a stakeholder driven process and will guide the City with strategic and multi-billion dollar decisions for water infrastructure projects to make LA a more water resilient and sustainable City.

→ Water system master planning lead for the Padre Dam Municipal Water District, California, 2015 Comprehensive Facilities Master Plan. This integrated master plan involves the District's water, wastewater, and recycled water infrastructure. This project includes (recycled) water demand/sewer flows forecasting, water supply analysis, hydraulic modeling updates for the water and recycled water systems, development and calibration of a new sewer model, and field condition assessment of key facilities with operations staff. In addition, the feasibility of the wastewater plant expansion for an indirect potable reuse project was evaluated. The findings were combined in a comprehensive capital improvement program (CIP) and water master plan report.

→ Water system master plan lead for the City of Oceanside, California, 2015 Integrated Water, Wastewater, and Recycled Water Master Plans. This project includes (recycled) water demand/sewer flows forecasting, water supply analysis, hydraulic model updates for the water and

wastewater systems, and development of a new recycled water system model. As part of the model calibration process, coordination with operations staff was conducted. In addition, the infrastructure needs of the development of the agricultural Morro Hills area, including soil percolation testing for feasibility analysis of septic tanks, were evaluated. Closed-circuit television of 60 sewer and 30 water pipeline segments were conducted. The findings were combined in a comprehensive CIP and water master plan report.

→ Project engineer for the City of Glendale, California, 2016 Water Master Plan. This project includes potable and recycled water demand forecasting, water supply analysis, hydraulic model updates for the water and recycled water systems using H_2OMap. In addition, the infrastructure upgrades for the existing and future systems, including fire flow capacity upgrades, were evaluated. The findings were combined in a capital improvement program (CIP) and water master plan report.

→ Assistant project manager for the City of Banning, California, 2018 Integrated Master Plan. The project includes an integrated approach to potable water, wastewater, and recycled water demand/flow forecasting, hydraulic model updates and model calibration for the potable water and wastewater systems, hydraulic model creation for the recycled water systems, and supply analysis. Infrastructure upgrades for the existing and future systems were evaluated.

→ Project engineer for the University of California, Irvine, California, Water and Recycled Water Master plan. The project includes the creation of water system and recycled water system models, as well as a blueprint for additional facilities for UC Irvine to handle their projected growth and development on campus. This is the first water and recycled water master plan for UC Irvine.

→ Lead planner for the Moulton Niguel Water District, California, Recycled Water Master Plan. This project includes recycled water demand forecasting, modeling, and alignment alternatives analysis to evaluate the most cost-effective system expansions. In addition, a turf replacement analysis tool was developed and a field condition assessment of existing recycled water system facilities was conducted.

→ Project engineer for the Recycled Water System Model Update and Calibration for the City of Santa Barbara, California. The project involved updating and recalibrating the existing recycled water hydraulic model with 2013 SCADA data, billing records, and facility controls. Various operational scenarios were evaluated and control strategies were developed to improve operational conditions to decrease pressure fluctuations throughout the system.

→ Project engineer for the Irvine Ranch Water District (IRWD), California, 2016 Recycled Water Customer Connection Analysis. This project included utilizing IRWD's InfoWater model to identify pressure and system impacts with new customers connected to the system. The results were presented in a Technical Memorandum.

→ Project engineer for the preparation of the 2016 Prop 1 Technical Report, 2018 Title XVI Grant Report, and 2019 Grant Technical Assistance for the Inland Empire Utilities Agency (IEUA), California, Recycled Water Intertie Project. The project also included the City of Pomona and Monte Vista Water District. The grant report included a feasibility analysis of various intertie alternatives, cost estimates, water quality review, treatment alternatives, groundwater recharge alternatives, hydraulic modeling, groundwater modeling, and the preparation of various reports that conformed to grant requirements.

→ Planning lead for the Eastern Municipal Water District (EMWD), California, USBR Agricultural Water Conservation and Efficiency Grant. This project includes onsite plant improvements that would contribute to increased pressures for the more efficient use of recycled water for local farmers.

→ Project engineer for the Indio Water Authority, California, 2015 recycled water feasibility study.

Education

PhD Engineering, University of Pretoria, South Africa, 1995

BS Eng Hons Water Utilization Engineering, University of Pretoria, South Africa, 1992

BS Hons Biomedical Engineering, University of Cape Town, South Africa, 1985

BS Chemical Engineering, University of Cape Town, South Africa, 1982

Licenses

Civil Engineer, California

Professional Engineer, Texas, South Africa

Professional Affiliations

American Society of Civil Engineers

American Water Works Association

International Water Association

South African Institute of Chemical Engineers

Water Environment Federation

Water Institute of Southern Africa (Fellow)

Graham J.G. Juby, Ph.D., P.E.

Dr. Graham Juby, a vice president with Carollo Engineers, has 37 years of experience in planning, testing, and process design for water and wastewater treatment facilities, with an emphasis on water reuse. He has focused on advanced treatment processes such as low- and high-pressure membrane systems (microfiltration and reverse osmosis), nutrient removal, and the application of ozone, granular activated carbon (GAC), biological filtration, ion exchange, and ultraviolet (UV). His background in these technologies includes both pilot plant and full-scale design experience. His experience also includes a number of planning projects. He has also been involved with several fast-track and alternative delivery projects.

Relevant Experience

→ Principal-in-charge and Project Manager for the 2020 Update of the Integrated Master Plan for the Wastewater Collection and Treatment Facilities for the City of Riverside, California. This comprehensive master plan has a 20-year outlook and began in 2017. For the collection system it included condition assessment of lift stations and sewers, hydraulic modelling, age analysis, and an assessment of future flows to establish the required CIP to meet repair and replacement (R&R) and growth. The 46-mgd treatment plant evaluation also included condition assessment of selected facilities, process modeling to establish unit process capacity, consideration of future potential regulations (including future total nitrogen and total phosphorous limits, and salinity reduction), climate change impacts, and requirements for R&R and growth. The master plan also included a comprehensive financial plan and user rates and fees analysis.

→ Principal-in-charge for Carollo's portion of the work for the 2015 Wastewater Facilities Master Plan Update Report for the Inland Empire Utilities Agency (IEUA), California. This assignment involved demand projections, analysis, hydraulic modeling, and evaluation of technology needs and cost estimates for five IEUA treatment facilities, through the planning horizon of 2060.

→ Project manager/Principal-in-charge for the 2015 Wastewater Facilities Master Plan Update for the Eastern Municipal Water District (EMWD), California. This assignment involved demand projections, analysis, development of trigger curves based on plant organic loading, and evaluation of new facilities needs at all four of EMWD's regional water reclamation facilities (RWRFs). Anticipated layouts for each RWRF were developed along with capital costs to take all facilities to their ultimate buildout capacities in the year 2060.

→ Principal-in-charge for the Warm Springs Lift Station Condition Assessment Project for the Eastern Municipal Water District (EMWD), California. This project involved the condition assessment of the 30-year old lift station and 15,600 linear feet of the two influent sewers, including 52 manholes. To avoid manned entry into the aging lift station wet well, a drone was used to capture video footage of the internal condition. High resolution video footage of the two sewers and manholes were captured and assessed. For the lift station a comparison was made between constructing a new lift station or rehabilitating the existing station from a dry-pit configuration with horizontal centrifugal pumps to a submersible wet-well configuration. Ultimately, EMWD chose to design and construct a new lift station.

→ Principal-in-charge for the San Jacinto RWRF Plant 1 Rehabilitation project for the Eastern Municipal Water District (EMWD), California. The project includes preliminary and final design for rehabilitation of Plant 1, including condition assessment, process modelling and evaluating whether the existing Plant 1 secondary clarifiers could be reused. It was determined that the existing Plant 2 Secondary Clarifiers have adequate capacity to handle mixed liquor from both plants and the existing Plant 1 clarifiers are to be decommissioned and used for emergency storage. Part of this project included and evaluation of aeration diffusers to re-

place the aged Parkson panels in the currently unused Plant 1. Tube-type diffusers were selected. The design is underway.

→ Principal-in-charge for the Moreno Valley Regional Water Reclamation Facility Tertiary Effluent Equalization Project for the Eastern Municipal Water District, California. This project included both preliminary and final design of in-plant infrastructure to convey tertiary treated effluent to an existing pond, modified to become an equalization storage basin for the tertiary effluent. Part of the work included assisting the District with a UASB grant application, which was successful. The design is complete, and the project is moving into construction.

→ Principal-in-charge for the SBWRP Primary Influent Flow Equalization for San Bernardino Municipal Water Department, California. The project is currently in design and includes installation of two new primary influent equalization basins, pump station, and ancillary facilities.

→ Project leader for the start-up and optimization of the Perris Valley Plant 3 secondary treatment process for Eastern Municipal Water District, California. This project is ongoing and involves optimization of a new 16-mgd BNR aeration basin and secondary clarification system for the Perris Valley Regional Water Reclamation Facility. The step-feed reactor is being optimized to reduce the TIN in the final effluent. The project includes optimization of chlorine dose for disinfection in order to reduce chemical costs.

→ Project leader for the optimization of the Temecula Valley Plant 2 secondary treatment plant for Eastern Municipal Water District, California. This is an ongoing project to optimize the performance of the 4-mgd activated sludge system in one of the parallel plants at the Temecula Valley Regional Water Reclamation Facility. The purpose is to optimize TIN removal and produce a fully nitrified effluent to avoid downstream disinfection issues and high chlorine doses. Ultimately, the optimized plant will have lower operating costs and result in reduced disinfection costs.

→ Technical advisor for the Overhaul of Unit 1 Primary and Aeration System Project Development Report for the San Bernardino Municipal Water Department, California. The project developed an approach to rehabilitate the existing 50-year old facilities including innovative concepts to remain within the limited hydraulic grade line, convert the secondary process to nitrogen removal, and maximize the capacity.

→ Principal-in-charge for the Orange County Water District's (OCWD), California, evaluation of alternatives to increase nighttime flows to the Groundwater Replenishment System (GWRS) from the Orange County Sanitation District's Plant No. 1. The project involves working with Orange County Sanitation District staff to evaluate both collection system and in-plant alternatives. A promising alternative includes converting the existing P1-33 primary clarifiers into storage tanks to hold microfiltration backwash water from GWRS and discharging the flow in a controlled manner during the daily low flow period at night.

→ Project manager for the evaluation of membrane bioreactor (MBR) technology as an alternative for expanding the capacity of Plant 3A for the South Orange County Wastewater Authority, California. Plant 3A is currently operating at around 4 mgd with a capacity of 6 mgd. A technical and economic evaluation was performed to investigate how all or part of the plant could be retrofitted with membranes to increase the capacity to 8 mgd. Both combined aeration/membrane tanks and separate membrane tanks were evaluated and compared with a conventional plant expansion and tertiary filtration, and an expansion involving the *IMANS*® approach.

→ Principal-in-charge for the Evaluation of PFOA and PFAS Removal for the City of Corona, California. The City had detected per- and poly-fluoroalkyl substances (PFAS) in some of their wells. The scope of work included planning and on-site bench scale testing to determine the efficiency of removal of perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) with ion-exchange resin and GAC.

Education

MBA Business Administration, San Diego State University, 2012

BS Civil Engineering, San Diego State University, 2008

Licenses

Civil Engineer, California, Nevada

Certification

Qualified Stormwater Pollution Prevention Plan Developer (QSD) and Practitioner (QSP), SWRCB, 2011

LEED Accredited Professional, USGBC, 2010

Certified Professional, AutoCAD Civil 3D, 2012

Professional Affiliations

American Society of Civil Engineers (ASCE)

American Public Works Association (APWA)

Andrew J. Frost, P.E.

Andrew Frost has more than 12 years of experience in civil engineering design and project management including pipelines, sewer mains, storm drains, potable/recycled water, condition assessment, dry utilities, roadway, grading, and site design. He has provided support for water quality management plans (WQMP) and prepared storm water pollution prevention plans (SWPPP) incorporating post-construction best management practices (BMP) into project design to meet local and statewide requirements. He has a proven track record of successful project management delivering over $120M of construction projects in the past three years. He is highly versed in three dimensions design and drafting including the use of Civil 3D, Navisworks, and Building Information Modeling.

Relevant Experience

→ Assistant Project Manager and lead civil engineer for the Eastern Municipal Water District, Warm Springs Lift Station replacement design. Responsible for project scheduling and coordination, client presentations and budget tracking. Engineering duties included the new 36-inch gravity sewer connections, dual force main connections from the new lift station, and complete design on the on-site yard piping, utility systems, and site grading design.

→ Senior engineer for the County of San Diego, California, Los Coches Streambed Stabilization at Vulnerable Sewer Locations. Responsible for the development of the preliminary engineering report to assess the cover over the existing sewer facilities, and provide an analysis of the existing conditions including recommendations for long term improvements to increase the stability of the sewer system. Project considered existing CCTV data, as built record drawings, site survey, and potholing to develop recommended improvements across ten different risk areas determined by the County of San Diego Public Works Department.

→ Project manager for the County of San Diego, California, Spring Valley Trunk Sewer Rehabilitation. Responsible for the preliminary and final design to develop a prioritized plan to address rehabilitation or replacement of 73 manholes along the Spring Valley trunk sewer main. Project included review of existing data, development of a preliminary engineering report, and final design drawings and specifications for all improvements.

→ Project manager for the Encina Wastewater Authority, California, Effluent Equalization Basin Settlement. Responsible for the creation of a technical memorandum to develop recommendations to alleviate settlement issues occurring along the north edge of the existing effluent equalization basins at the Carlsbad Water Recycling Facility. Project included site investigations, geotechnical borings, and survey to verify existing conditions.

→ Senior engineer for the Encina Wastewater Authority, California, 84-inch Land Outfall Improvements. Responsible for the design of improvements to the land outfall system for Encina Wastewater Plant. Improvements include repairs to the existing 84-inch outfall pipe, recoating of existing 60-inch primary effluent line, 24-inch 3W waterlines, and miscellaneous drainage piping at surge chamber, and relining of the existing 60-inch secondary effluent line from the effluent pumping station.

→ Project manager for the Hi-Desert Water District, California, Phase I Collection System. Responsible for engineering services during construction for the Phase I collection system construction. Project included 77 miles of pipeline, including gravity and force main construction, twelve jack and bore crossings under Cal Trans right of way, over 5000 private property connections, and three lift stations. Engineering services include on-site support, RFI and submittal responses, technical reports and memo, cost estimating, and final record drawings.

Previous Experience

→ Project manager for the Wastewater Collection System Phase 1 project for the Hi-Desert Water District, California. Responsible for the design of gravity sewer, force main, and lift stations as part of a septic to sewer

conversion project. The project is the first of three phases to convert existing septic systems to public sewer in order to protect groundwater quality. Approximately 5,000 homes will be converted with 77 miles of pipeline and three lift stations. Project includes all aspects of design from plan and profile drawings, cost estimating, specifications, bid support, and construction support.

→ Project manager for the Waterline Capital Replacement Program for the Hi-Desert Water District, California. Responsible for overseeing design of 24 miles of waterline ranging in size from 6 inches to 12 inches. The project included the relocation of distribution mains from alley areas to public right-of-way, relocation of private water meters, and construction of new fire hydrants.

→ Senior engineer for a theme park project for the City of Los Angeles, California. Responsible for civil site design including grading, utilities, roadway, and civil control as part of a new attraction. The project included major site demolition, grading, site improvements, and utility designs. The new theme park included seven new buildings on the existing site. New utilities included sewer, water, hot/chilled water supply, gas, and compressed air were all constructed as part of the project.

→ Engineer of record and lead civil engineer for the Glendale Narrows Riverwalk for the City of Glendale, California. Responsible for the design of a new one-mile bike trail and two park areas as part of the Glendale Riverwalk Phase 2. The project included design of a new Class I bikeway, ADA upgrades, site walls and grading design, drainage improvements, and truss bridge over an existing culvert.

→ Engineer of record and project manager for the Camino Del Mar Sewer Force Main for the City of Del Mar, California. Responsible for the design of 6,200 linear feet of 10-inch sewer force main from the 21st Street pump station to the City of Solana Beach. The project involved the crossing of two separate bridges over sensitive habitat and railroad right-of-way. The project involved a phased operation allowing existing flows to be pumped in two directions, either north or south as required by the City of Del Mar.

→ Senior engineer for the 2013-2014 Street and Drainage Improvements for the City of Del Mar, California. Responsible for the design of approximately 3,500 linear feet of curb, gutter and sidewalk along Camino Del Mar. The project also included the replacement of several pedestrian ramps and storm drainage improvements.

Education

BS Technology, University of Houston, 1984

MS Environmental Engineering, Loyola Marymount University, 1997

Licenses

Civil Engineer, California, Nevada

Megerdich "Miko" Aivazian, P.E.

Miko Aivazian has more than 30 years of experience in marketing, planning, design, and construction of facilities for environmental, industrial, and commercial projects. He has been involved as a senior project/client manager and engineer for several water/wastewater projects for more than 27 years, including planning, study, design and construction management of pumping stations, reservoirs, pipelines, and water and wastewater treatment plants. He has managed the design and construction of many projects for major Southern California clients and has been involved on several design-build projects.

Relevant Experience

→ Project manager for the Elsinore Valley Municipal Water District's Diamond Regional Sewer Lift Station (DRSLS) and Dual Forcemains (DFMS) – DRSLS encompasses three major components: New Lift Station, New Dual Forcemains, and system improvements and tie-in the existing sewer system. DRSLS is a three phased project with a peak flow capacity of 9, 14.8, and 19.9 MGD. The phase 1 will construct the structure for the ultimate phase three capacity and the equipment will be installed to meet the phase 1 peak flow capacity. The DRSLS also includes a pre-treatment (Grinder) and an odor control facility. The lift station is a Dry-Pit Submersible type lift station with a depth of approximately 45-feet. This project also includes a DFM approximately 3,100-feet long, one 24-inch and one 16-inch inside diameter HDPE pipelines. Miko has been coordinating the design of this project with the District as well as the subconsultants and other agencies. The project is currently at 60 percent completion level and is schedules for 100 percent completion in October of 2019.

→ Project manager for the San Diego International Airport/Sundt Stormwater Design-Build Validation Phase for the San Diego International Airport (SDIA); California. Carollo was hired by Sundt Construction, Inc. to provide design and engineering services during construction for the proposed stormwater storage tank known as Cistern "C". The Cistern C sizing was based on the Strategic Stormwater Master Plan (SSMP) recommendations – Capture and Reuse Project developed for the San Diego Airport Authority. As part of the project, Carollo validate the hydrology model with a 85% capture rate. The Cistern C was sized for 3.0 MG storage capacity and included an inlet pipe, overflow system and two submersible pumps with an average 130 gpm serving as the cistern outlet system. Carollo was also responsible for the structural design of the cistern that included a cast-in-place circular tank with a diameter of approximately 160-feet. The cistern also included 32 interior columns and a top deck that was designed for traffic loading due to the cistern location under the existing parking area. Miko coordinated the sizing and design efforts during the schematic design, design development, construction documents phases with the DB team and the Airport Authority and in now working construction phase of this project

→ Project manager for the City of Pasadena, California, Replacement of the Sunset Reservoir preliminary design project. The project involved the seismic/structural evaluation of a 5.6-MG elliptical-shaped reservoir with a hopper bottom and wood-framed roof originally constructed in 1888. Operational strategies, rehabilitation/retrofit, and replacement alternatives were considered. Findings and recommendations were presented in a report with conceptual level cost estimates.

→ Project manager for the Inland Empire Utilities Agency, California, Baseline Recycled Water Pipeline Project. The Baseline Recycled Water Pipeline Project at northeastern portion of the service area includes an existing 24-inch diameter pipeline located in Baseline Avenue will be extended approximately 8,200 linear feet to Cherry Avenue in the City of Fontana of which 4,500 linear feet will be along Baseline Avenue and 3,700 feet will be along South Heritage Circle. The project will support recycled water for landscape irrigation in medians, park ways, and parks which will increase

the beneficial reuse of recycled water by approximately 105 AFY. The pipeline extension will be located within IEUA's 1630 pressure zone. There will be a potential to increase recycled water usage in the future with lateral branches from the 24-inch line pipeline to the north and south of Baseline Avenue and further east into the City of Fontana. This project will provide water reliability by reducing dependence on imported water and maximizing the beneficial reuse of recycled water.

Previous Experience

→ Project manager for the City of San Diego, California, Pure Water Program, Task 7 – Morena Pump Station, Wastewater Forcemain, and Brine Conveyance preliminary design. The Morena Pump Station was constructed to divert flow from the (E) Mission Valley Interceptor, screen the flow, and pump it through a 48-inch discharge forcemain to the North City Water Reclamation Plant (NCWRP). Provided civil design services, including development of alignment alternatives and 10-percent level design for the pipelines and pump station. Responsible for managing the project with City staff from project conception and working with permitting agencies, including Caltrans and Railroad Authorities, for tunneling sections of the pipeline alignment.

→ Project engineer for the Terminal Island High Pressure Effluent (HPE)/Low Pressure Effluent (LPE) Pump Station and Pipeline for the City of Los Angeles, Bureau of Sanitation, Environmental Engineering Department, California. The HPE/LPE system improvements upgraded the treatment plant's HPE and LPE wastewater pumping and distribution systems. The project replaced existing HPE and LPE pumping systems and associated distribution piping. The work included construction of a new 10-inch diameter HPE ductile iron pipeline loop around the treatment plant and connections to the existing HPE and LPE local service pipes.

→ Project manager for the Linden Reservoir Rehabilitation Project for the City of Riverside Public Utilities, California. This $5.4 million project consisted of preliminary engineering services to provide structural/seismic analysis of the existing tank structure and demolition of the existing 16 million gallon reservoir steel roof and replacing it with a new pre-manufactured aluminum roof system. Miko coordinated the design of the reservoir seismic upgrades and the new aluminum roof system with the roof manufacturer.

→ Project manager for the Evans Reservoir Replacement Project for the City of Riverside Public Utilities, California. This $13- million project consisted of demolition of the existing 16 MG concrete reservoir and construction of a new partially buried poured in place concrete reservoir in its location. The new 16 MG concrete reservoir is approximately 460 feet long by 200 feet wide and 33 feet deep, and is considered the City's most critical storage facilities. This project also included installation of large diameter piping, valving, meter vault, drain vaults and other appurtenances associated with the proposed reservoir.

→ Project manager for the 55-MG Elysian Reservoir for the City of Los Angeles Department of Water and Power, California. This project included design of a 55-million-gallon cast-in-place fully buried concrete reservoir within the footprint of the existing open basin reservoir. The design included a complete package for civil/structural and mechanical disciplines. The proposed reservoir was a hopper bottom type in order to reduce the perimeter wall heights and therefore reducing construction cost. The design also included site grading and drainage design.

→ Project manager for the Chevy Chase 968 Reservoir and Pump Station for the City of Glendale Department of Water and Power, California. This $21 million project included a buried poured-in-place concrete reservoir constructed under a golf course. The 15-million-gallon concrete reservoir is approximately 500 feet long by 225 feet wide and includes two separate cells. The project also included the design of a new 2,400-gpm booster pump station.

Education

ME Industrial Fluid Mechanics, Grenoble Institute of Technology, Grenoble, France, 1985

BS Mechanical Engineering, University Grenoble, France, 1983

Licenses

Civil Engineer, California

Environmental Engineer, Idaho

Certification

Project Management Professional, Project Management Institute, 2006

Professional Affiliations

American Water Works Association

American Membrane Technology Association

Vincent J. Roquebert, P.E., PMP

Vincent Roquebert has over 28 years of experience in environmental engineering. He initially joined Carollo Engineers to lead the firm's membrane filtration facilities design group. He has been responsible for projects such as water and wastewater treatment plants, evaporators, and waste-to-energy facilities using various delivery methods including design/bid/build, engineer/procure/ construct, and design/build. His technical expertise is highly focused on systems engineering, membrane filtration, and hydraulics.

Relevant Experience

→ Technical reviewer for the design of the North City Pure Water Facility for the City of San Diego, California. This advanced water treatment facility will produce 30 mgd high-quality drinking water using a proven five-step water purification process of ozonation, BAC filters, membrane filtration, RO, and UV disinfection with advanced oxidation. Responsibilities include providing technical review and technical support at the 60- and 90- percent review levels for the process mechanical design. Additional duties include leading the design support services team (structural, mechanical, and electrical) on during the demonstration phase of the project.

→ Technical reviewer for the design of the Santa Clarita Valley Sanitation District, California, Advanced Water Treatment facility at the Valencia Water Reclamation Plant. The 8-mgd treatment process includes membrane filtration, nanofiltration, ion-exchange, reverse osmosis, decarbonation, brine storage tanks, and chemical storage and dosing facilities.

→ Design manager for the preliminary design of the $77M, 28-mgd Baker Water Treatment Plant for Irvine Ranch Water District, California. The multi-source water is composed of State Water Project water, Colorado River Water, and Irvine Lake water. The treatment process includes pre-oxidation of iron and manganese with chlorine dioxide, in-line coagulation, membrane filtration, ultraviolet disinfection, chlorine disinfection, and chloramines residual. The Treatment process also includes membrane washwater recovery, dual-stage sludge thickeners, and centrifuges to minimize flow and solids discharged into the sanitary sewer. The plant has been in operation since 2017.

→ Process engineer for the Hyperion Reuse TOS SN-53 Program Management Services Project, Los Angeles Sanitation and Environment (LASAN), California. The project included program management support to develop the required for permitting MBR as pretreatment to reverse osmosis and other processes at the Hyperion WRP Advanced Water Facilities which distributes 235 mgd of treated water to the City of Los Angeles and other regional systems. Project management included contract development support, preparation of a Basis of Design Report, coordination with site-development, equipment prequalification, outreach, and engineering services during the Progressive Design-Build.

→ Design engineer for the City of Los Angeles Department of Public Works Bureau of Engineering, Terminal Island Water Reclamation Plant Advanced Water Purification Facility Ultimate Expansion Project, California. The project included the expansion of the advanced water purification treatment facility from 6-mgd to 12-mgd. The expansion includes additional microfiltration and reverse osmosis systems, advanced oxidation processes (AOP) system, and a balance of upgrades to the existing pumping systems, chemical addition system, comprehensive new control system, auxiliary systems, and utilities. The project includes the addition of an innovative AOP system using ultraviolet irradiation and sodium hypochlorite that will treat the full flow of 12-mgd and provide full advanced treatment. Responsible for the design of the new 10-mgd membrane filtration facility and coordination with the membrane filtration system supplier.

→ Design manager for the preliminary design of the GRIP Advanced Water Treatment Plant developed as part of the progressive

design-build effort for the Water Replenishment District of Southern California. The project includes a process building, a chemical storage area, three supplemental recharge wells, and an operations and learning center. The 10-mgd expandable to 28-mgd treatment process includes 3-mg influent equalization tank, butterfly arrangement membrane filtration system, 92.8-percent reverse osmosis (RO), UV/Advanced Oxidation Process, post-treatment, and product water pump station.

→ Project manager for the Mel Leong Treatment Plant industrial wastewater and recycled water upgrades project at the San Francisco Airport, California. The $51 million design-build project includes a new administration building and new treatment process units such as dissolved air flotation, pre-ozonation, and biological active filters.

→ Design manager for the owner's engineer team that supports Los Angeles Bureau of Sanitation, California, in the development of the conceptual design report (CDR) for the 25 mgd Tillman Advanced Water Purification Facility (AWPF). The CDR is being used as part of the RFP that will be selecting the design-build team for the AWPF. The treatment process includes ozone generation, biologically activated carbon filters, membrane filtration, reverse osmosis, and ultraviolet disinfection.

→ Project manager/project engineer for the City of Santa Barbara, California, El Cielito Pump Station Upgrades. The scope of services includes a phasing plan for installing the new electrical gear and pumps while the station remains in service.

→ Project manager for the Otay Water District, California, 870-2 Pump Station Replacement. The project includes preliminary design of a 20-mgd pump station and disinfection facility. The scope of services includes a detailed hydraulics analysis to accommodate five different pumping scenarios and a thorough pump selection process for saving energy through pump optimization and utility rebate program.

→ Project manager for the mechanical assessment and the renewal decision analysis for the 55-mgd Miramar Pump Station for the San Diego County Water Authority, California.

→ Project engineer for the rehabilitation of the South Coast Conduit Booster Pump Station for the City of Santa Barbara, California. He selected four new vertical turbine pumps for the 22-mgd pump station to minimize structural work at the existing pump station. He also witnessed the factory acceptance testing and the field performance testing as well as coordinated changes in pump design/material required by results from the shaft torsional analysis.

→ Lead membrane engineer for the final design of Phase 2 of a Biological Nutrient Removal (BNR)/Tertiary Treatment Facility for the City of Modesto, California. The final design was based on the approved Preliminary Design Report for a 12.6-mgd plant using BNR aeration basins, screens (1 mm), membrane bioreactors, and ultraviolet open channel for disinfection.

→ Project manager for the assessment of the nanofiltration and reverse osmosis membrane elements at the Port Hueneme Brackish Water Reclamation Facility for the City of Port Hueneme, California. The study allows the Agency to postpone the replacement of the membrane elements and redirect the work effort to the replacement of the seals and o-rings.

→ Design manager for the design of the 28-mgd Baker Water Treatment Plant for Irvine Ranch Water District, California. The plant capacity is 28 mgd. The water filtration plant expansion will include UV inactivation as a secondary barrier for *Giardia* and *Cryptosporidium*. The treatment process also includes membrane washwater recovery, dual-stage sludge thickeners, and centrifuges to minimize flow and solids discharged into the sanitary sewer.

Education

MBA Business Administration, University of Colorado, 2008

BS Electrical Engineering, Colorado School of Mines, 2002

Licenses

Professional Engineer, Colorado

Electrical Engineer, California

Professional Affiliations

Institute of Electrical and Electronics Engineers

International Society of Automation

Troy Hedlund, P.E.

Troy Hedlund has 18 years of experience as a project manager and as an electrical and instrumentation engineer in the design of water and wastewater treatment plants, large-scale solar photovoltaic (PV) systems, and cogeneration facilities. His experience encompasses all phases of project implementation (planning, design, and construction) and many facets of EI&C engineering including high-, medium-, and low-voltage power distribution and generation system design, process and motor controls, and SCADA and PLC network design.

Relevant Experience

→ Lead electrical and instrumentation design engineer for the final design of the City of San Diego North City Pure Water Facility. The project included the design of a new 34-mgd indirect potable reuse advanced water treatment facility and LEED certified operations, maintenance, and laboratory building. The electrical system design included 12.47kV service entrance switchgear, 4.16kV and 480V power distribution, and a 500kW standby diesel engine generator.

→ Project manager and lead electrical and instrumentation engineer for the City of San Diego Public Utilities District, California, Pump Stations 1 and 2 Electrical Upgrades Project. The project consisted of replacement of medium- and low-voltage electrical equipment, including 4.16-kV switchgear and motor starters, 480-V switchgear, diesel engine generators, and motor control centers at two of San Diego's most critical raw sewage pump stations, and reconfiguring the facility control systems to monitor and control the new electrical equipment. In addition to the electrical and control system upgrades, the project also included the design of a new electrical building.

→ Lead electrical engineer for the Orange County Sanitation District Plant No. 1 Headworks Rehabilitation Project (P1-105). The project included complete replacement of the existing influent facilities, including influent screening facilities, metering & diversion facilities, grit removal/handling facilities, and odor control, to replace existing equipment at the end of service life and to increase the hydraulic capacity of the overall influent processes to 320 mgd. To support the new influent processes, the project also included extensive upgrades to the electrical and controls systems, including a new 12.47kV power distribution center, and a new 10mW standby power facility.

→ Lead electrical and instrumentation engineer for the for the Orange County Sanitation District Plant No. 1 Primary Sedimentation Basins 6-31 Reliability Improvements Project (P1-133). The project included replacement of mechanical, electrical, and instrumentation equipment associated with (6) primary sludge pumps.

→ Lead electrical and instrumentation engineer for the San Clemente Water Reclamation Plant Recycled Water System Expansion Project, San Clemente, California. The project included the replacement of the electrical distribution and process control systems associated with the existing water reclamation facilities. In addition to serving the existing facilities, the new electrical distribution and process control systems also serve new facilities designed to increase the plant capacity from 2.2 mgd to 4.4 mgd. The plant treats secondary effluent from an adjacent wastewater treatment plant for distribution as reclaimed water.

→ Lead electrical and instrumentation design engineer for the El Estero Wastewater Treatment Plant Influent Screen Improvements Project for the City of Santa Barbara, California. The project included the design of new influent bar screens, a screenings conveyor, and washer/compactor units and the design of electrical, instrumentation, and controls required to accommodate the new equipment installed with the project.

→ Electrical design engineer for the Sunset View Mobile Home Park Lift Station for Owen Engineering, Englewood, Colorado. The project consisted of the design of a new sewage lift system, which included a duplex lift pump system, a utility service entrance, and a standby generator.

Troy Hedlund, P.E.

Awards

Outstanding Private Sector Civil Engineering Project - Honorable Mention, American Society of Civil Engineers, Los Angeles Section, 2013, City of Santa Barbara El Estero Wastewater Treatment Plant Headworks Screening Replacement

Project of the Year, American Society of Civil Engineers, Santa Barbara/Ventura Branch, 2012, City of Santa Barbara El Estero Wastewater Treatment Plant Head-works Screening Replacement Project

→ Lead electrical and instrumentation engineer for the County of Santa Barbara Department of Public Works/Laguna County Sanitation District Phase 1 Plant Upgrade Project. The project included design of new treatment processes to replace existing, including headworks, grit basins, aeration basins, blower building, secondary clarifiers, scum pump station, and RAS/WAS pump station.

→ Lead electrical engineer for the City of Vista, CA, Buena Vista, Buena Creek, & Raceway Sewage Pumps Stations VFD & PLC Replacement Project. This project included replacement of VFDs and PLCs at three of the City's critical raw sewage pump stations. In addition to designing the electrical and controls equipment replacement, Carollo also developed detailed construction sequencing and bypass pumping specifications to ensure continuous operation of the pump stations during construction.

→ Electrical design engineer for an 8.5-MW cogeneration project for the South Treatment Plant for King County, Washington. Included in the design were two 3.5-MW gas turbine generators; one 1.5-MW steam turbine generator; a new 13-kV switchgear; a 480-V, 350-kW standby engine generator; heat-transfer equipment; lighting; and site electrical.

→ Project manager and lead electrical engineer for the Electrical Distribution and Substation Improvements project for the Santa Fe Irrigation District, California. Troy provided design services to replace the existing 12-kV service entrance and electrical power distribution system at the R.E. Badger Water Filtration Plant. The design included new 12-kV and 4.16-kV switchgears, a 480-V switchgear, 480-V motor control centers, and a new standby diesel engine generator. The design also included a new 5,000-square-foot main electrical building.

→ Lead electrical, instrumentation and controls design engineer for the Irvine Ranch Water District, California, Rattlesnake Reservoir Chlorine Gas System Replacement. Carollo is providing engineering services to replace the existing chlorine gas system with a bulk sodium hypochlorite system. His responsibilities included design of the electrical, instrumentation, and controls associated with the new sodium hypochlorite storage and feed equipment.

→ Lead electrical and instrumentation design engineer for the Cater Water Treatment Plant Advanced Treatment Project for the City of Santa Barbara, California. The project included installation of ozone, dewatering, and various new chemical storage and feed facilities and design of a new electrical service and the integration of the new facilities into the existing plant SCADA/PLC network.

→ Lead electrical and instrumentation design engineer for the Ortega Groundwater Treatment Plant Project for the City of Santa Barbara, California. The project included design of new electrical, instrumentation, and control systems to accommodate the new equipment installed with the project.

→ Project manager for the Henry C. Garnett Water Purification Plant Service Entrance Upgrade Project for the Kern County Water Agency Improvement District No. 4, Bakersfield, California. The project included the design of a 115-kV substation consisting of two 14-MVA substation transformers, and a 4.16-kV power distribution system consisting of remote controlled 4.16-kV switchgear, two 2.0-MW standby diesel engine generators, and extensive coordination with PG&E for interconnection of the onsite generation sources.

→ Electrical, instrumentation, and control design engineer for the Palmdale Water Treatment Plant Improvements Project for the Palmdale Water District, California. The project included the design of a new sludge removal system, a 480-V switchgear, a 1,000-kW standby engine generator, extensive modifications to the existing plant 480-V electrical distribution system, site electrical, a new rotating screen on the plant influent water line, site lighting design, and a complete replacement of the existing instrumentation and control system and fiber-optic SCADA/PLC communication networks.

Education

MS Electrical Engineering, Colorado School of Mines, 2009

BS Electrical Engineering, Colorado School of Mines, 2003

Licenses

Professional Engineer, Colorado, Hawaii, Oregon, Washington, Illinois, Florida, Ohio, New York, Maine

Electrical Engineer, Arizona, California

Professional Affiliations

Institute of Electrical and Electronic Engineers

Illuminating Engineering Society of North America

Monte K. Richard, P.E.

Monte Richard brings more than 17 years of experience in electrical and control system engineering and design. His focus is in electrical distribution systems, process control, and industrial instrumentation for water and wastewater facilities and infrastructure. He works on a company wide basis with plant operations and managers to test, start-up, optimize and troubleshoot water and wastewater treatment plants.

Relevant Experience

→ Lead instrumentation and control engineer for the Oceanside Major Plant SCADA Upgrades project for the City of Oceanside, California. This master planning and design effort included the planning and design for a consistent SCADA system across four treatment facilities and over 50 remote facilities. He worked to prioritize required control system upgrades within a fixed budget; evaluated obstacles to convert existing system communication protocols to new protocols; and worked on standardizations for consistent control among treatment and remote facilities.

→ Lead control and instrumentation engineer for the 160 mgd Bull Run Filtration Project for the Portland Water Bureau, Oregon. Project includes design of all on-site treatment facilities. Monte is leading the design of a new plant-wide supervisory control and data acquisition (SCADA) system, programmable logic controller system, and redundant fiber communications backbone.

→ Lead control and instrumentation engineer for the City of Fresno, California. Responsible for providing SCADA planning and standards for the City's greenfield Southeast Surface Water Treatment Facility. The project included several I&C workshops to develop design and programming standards for the control and instrumentation system. Workshops included interactive demonstrations from potential vendors. Project included full design of the PLC, SCADA and IT infrastructure, including network block diagram, network routing diagrams, radio path studies, radio design, server layouts, P&IDs, control descriptions, and PLC and SCADA hardware and software specifications. Design included radio communications with a new offsite interconnection diversion structure and metering vault.

→ Project manager and lead control and instrumentation engineer for master planning services for the City of Boulder, Colorado, 75th Street Wastewater Treatment Facility. The master planning effort included field investigation and condition assessment of the existing process automation system that includes two GE 90/70 programmable logic controllers and over 30 remote Genius Bus drops. Staff surveys were conducted to understand the needs and desires of management, information technology, operations, and maintenance. Based on findings from the field investigation and staff surveys, recommended projects were scoped, prioritized, and budgeted for integration into the facilities short and long-term Capital Improvements Project schedule. In addition to the planning documents, Carollo developed an Electrical, Instrumentation, and Control Design Standards Document for use on current and future projects at the facility.

→ Lead instrumentation engineer for the City of Prescott, Arizona, Water and Sewer Division. He was responsible for providing supervisory control and data acquisition (SCADA) master planning services and instrumentation and control design standards. The master planning included analysis of SCADA implementation and radio communications between their water treatment facility, three wastewater treatment facilities, 64 lift stations, 30 storage tanks, 40 booster stations, and more than 85 pressure zones. A radio and fiber optic communication feasibility study was conducted to provide the City with a plan for integrating their primary and remote facilities into a common SCADA network. In addition to the planning documents, Carollo conducted several workshops in order to develop an Instrumentation and Control Design Standards Document for use throughout the Water and Sewer Division.

→ Lead control and instrumentation engineer for the City of Oak Harbor, Washing-

ton Clean Water Facility. Responsible for providing SCADA master planning and standards for the City wastewater department. The project included several I&C workshops to develop design and programming standards for the control and instrumentation system. Project included full design of the PLC, SCADA and IT infrastructure, including network block diagram, network routing diagrams, server layouts, P&IDs, control descriptions, and PLC and SCADA hardware and software specifications.

→ Lead technical advisor for the City of Aurora, Colorado, Water and Wastewater. Responsible for providing supervisory control and data acquisition (SCADA) master planning services and instrumentation and control design standards. The master planning included analysis of SCADA implementation and radio communications between their three water treatment facilities, one wastewater treatment facilities, lift stations, storage tanks, and booster stations. He assisted in the planning and execution of several interactive workshops to acquire group consensus on SCADA standards and project implementation.

→ Project manager and lead electrical and instrumentation engineer for condition assessment at the Eastern Municipal Water District, California, Temecula Valley Regional Water Reclamation Facility. He was responsible for providing field investigations and condition assessments of the existing programmable logic controller (PLC) components and network infrastructure. The facility's PLC network includes 26 existing Allen-Bradley PLCs and Remote IO modules communicating over a DH+ network. Carollo provided a preliminary design report (PDR) detailing the necessary upgrades to the facility in order to provide a more reliable, sustainable, and maintainable PLC system. The PDR included the preliminary design documentation and cost estimates for plant-wide fiber optic infrastructure installation allowing for phased replacement of the obsolete PLCs throughout the facility.

→ Project engineer responsible for providing a system wide Uninterruptable Power Supply (UPS) study and recommendation for the City of Aurora, Colorado. The project included the investigation, analysis, cost estimate, and recommendation for replacement of over 200 UPS systems located throughout the City's water treatment and transmission and distribution systems.

→ Project manager for the City of Aurora, Colorado, Wemlinger WPF PLC Upgrades Project. Managed the design, procurement, and construction services to replace Wemlinger's existing PLCs with new Allen Bradley ControlLogix PLCs.

→ Lead electrical engineer for the City of San Diego, California, Influent Pump Stations No. 1 and No. 2 electrical system studies. This design-build project included replacement of two medium-voltage service entrance switchgear lineups, two unit substations, and six medium-voltage starters for 1,250-horsepower motors. The project required coordination with contractors during arc flash studies, field investigation studies, fault current studies, and protective device studies.

→ Electrical and design engineer for the Santa Fe Irrigation District, California, Joint Facilities Master Plan and Arc Flash Analysis. The project consisted of conducting protective device coordination, fault current studies, and arc flash studies for three of the District's facilities, including the Cielo Pump Station, San Dieguito Pump Station, and the R.E. Badger Water Filtration Plant. Recommendations were provided to improve the arc flash safety along with cost estimates for the associated projects.

→ Electrical, instrumentation, and control design engineer for the City of San Diego, California, Influent Pump Stations No. 1 and No. 2 improvements. This design-build project included replacement of two medium-voltage service entrance switchgear lineups, two unit substations, and six medium-voltage starters for 1,250-horsepower motors; arc flash studies including field investigation; fault current studies; and protective device studies.

Education

GED, Central Arizona College, Coolidge, AZ, 1998

Certification

OSHA Certified

Certified OPI team leader

CPR/ First Aide

Accomplishments

Emergency Response Team (12yrs. as Captain)

Conducted ERT training regimen

Drafting/Engineering

Maurice Sanchez

Moe Sanchez is an OSHA-certified lead inspector of Carollo's construction services group. He has successfully brought designs to life through his ability to think on his feet, problem solve, and effectively implement safety processes and training programs for more than 25 years. He specializes in water and wastewater treatment plant construction, with experience ranging from complex pharmaceutical manufacturing, ozone, and chemical treatment processes to conventional mechanical pump stations, pipelines, and civil site work.

Relevant Experience

→ Inspection engineering support for the Encina Water Pollution Control Facility Primary Area Improvement project for Encina Wastewater Authority, California. Responsible for reviewing drawings, specifications, and material take offs, and to identify areas that will need special inspections.

→ Inspection engineering support for the Encina Water Pollution Control Facility Primary Effluent Conveyance System Rehabilitation project for Encina Wastewater Authority, California. Responsible for reviewing drawings and specifications related to this work. While overseeing this project, Moe will maintain communication between owner, contractor and engineer. There will be a significant amount of demolition and rehabilitation of slide gates, equipment and structures. An elaborate bypass system of piping and pumps will need to be in place prior to taking the 72-inch PE line out of service. Maurice is responsible for inspecting the 72-inch PE pipe preparation prior to installation of the cured-in-place pipe lining.

→ Inspection engineering support for the Regional Water Reclamation Facility Expansion and Upgrade Program Management project for Elsinore Valley Municipal Water District, California. Responsible for identifying corrections to the 95% design submittal. The designer had a 42-inch FE pipe at the same elevation as the existing 24- and 30-inch PI piping. The contractor could have claimed a delay, as well as additional cost associated by exploring the area for a new approach. Since Maurice identified the issue prior to 100% designed, the correction was made by changing the elevations. This prevented additional cost.

→ Deputy construction manager and lead inspector for the Southeast Surface Water Treatment Facility for the City of Fresno, California. This $160 million project includes the design and construction of a new, greenfield water treatment facility to treat surface (river) water to drinking water standards and enable diversification of the City's water supply. Treatment processes include ozone, conventional pretreatment with flocculation and sedimentation, granular media filters, and chlorination. The facility will be fed with surface water from the Kings River through a newly constructed 13-mile-long Kings River Pipeline.

→ Superintendent for the City of Austin, Texas, Water Treatment Plant No. 4. The $360 million construction project is initially a 75 mgd facility but includes components sized for up to 300 mgd of capacity. The facility was constructed on a greenfield site and took over 4 years to construct. New tunnels, pump stations, lake intake, and a new treatment plant were constructed on a greenfield site in Northeast Austin. The plant includes new lime softening basins, granular media filters, clearwells, solids thickening, dewatering centrifuges, a sodium hypochlorite generation system, and several chemical storage and feed systems. The overall project was divided into several packages to gain an early start on critical path activities.

→ Mechanical superintendent for the Dual Media Filters Phases 3 & 4 Upgrade and Expansion Project for Clark County Water Reclamation District, Nevada. This $89 million project consisted of the construction of new structures to treat an additional 40-mgd of wastewater and double the existing facility's throughput capacity. New treatment processes include granular media filters, filter influent pump station, low pressure ultraviolet (UV) disinfection facilities, reclaimed water pump station, pumps at the existing backwash supply facility, blower at

the existing blower facility as well as replacement of the existing chemical feed facility, retrofit of the existing waste wash water facility, retrofit of existing medium pressure UV disinfection facilities, and modifications to the existing effluent Parshall flume.

→ Mechanical superintendent of the Water Treatment Plant No. 4 project for the City of Austin, Texas. This $390 million project involved the design and construction of a new water treatment plant with a submerged intake in nearby Lake Travis and an expansion capacity of 300 mgd. Treatment processes include lime softening, granular media filtration, UV disinfection, and chloramination. The plant was constructed on a challenging hillside site in a sensitive environmental area, requiring the implementation of a rigorous process to implement best management practices and environmental mitigation measures.

→ Mechanical superintendent for the Pima County Ina Road Water Pollution Control Facility for the Pima County, Arizona. This $225 million project was the largest approved contract in Pima County history to replace outdated treatment facilities while increasing treatment capacity from 37.5 mgd to 50 mgd and meeting federal standards. New ammonia/nitrogen/nutrient removal process system (5-stage Barden) replaced an existing high purity oxygen (HPO) and biological nutrient removal activated sludge (BNRAS) systems. Additional upgrades included modifying effluent disinfection facilities using sodium hypochlorite technology followed by de-chlorination, interim biosolids digestion and thickening improvements, biosolids facilities for additional sludge from an offsite 25-mgd water reclamation plant, odor control, and other miscellaneous support upgrades.

→ Foreman for the Reclamation Facility Phase 3 Expansion for the City of Casa Grande Water, Arizona. This $49 million project involved the expansion of existing wastewater treatment facility from 4 to 12 mgd. Modified existing aeration basins to increase each basin capacity to 3 mgd and added of a new fourth basin. New disinfection facilities to replace the existing gas chlorine system with the largest on-site sodium hypochlorite generation system for a wastewater facility within Arizona. Maintained existing plant in operation during construction activities with extensive workshops and meetings to coordinate the activities with the City operations staff and engineer to make sure that the permit limits were met at all times during construction. Delivered the final construction project under budget.

→ Foreman for the Surface Water Treatment Plant 15 mgd Expansion for the City of Chandler, Arizona. This $50.5 million project increased production capacity of the existing surface water treatment plant from 45 million gallons per day (mgd) to 60 million mgd. The expansion included construction of new raw water inlet and pump station, tied into the Consolidated Canal, new ballasted flocculation basin, equalization basin, chlorine generation system, carbon dioxide system, chemical and electrical buildings, filtered water pump station, and sludge drying areas. Construction time was limited to the canal dry-up cycle, and significant resources were dedicated to the work.

→ Foreman for the Jonny G. Martinez Water Treatment Plant for the City of Tempe, Arizona. This $38.2 million project involved the construction of a new UV disinfection facility that will accommodate expansion of existing water treatment plant with large-scale reactors located in a dedicated building downstream of filtration. Four duty and one standby UV reactors each sized to treat 20 mgd of flow using 84 low-pressure high-output UV lamps are located in buildings that allow easy access to the reactors for maintenance, such as lamp and sleeve replacement.

Education

BSE Environmental Engineering and Science, University of Florida, 1986

Licenses

Professional Engineer, Florida, Oregon, Texas

Civil Engineer, California

Environmental Engineer, Arizona

Certifications

CA Grade III WWTP Operator

Professional Affiliations

Water Environment Federation

American Water Works Association

Brian J. Graham, P.E.

Brian Graham is an environmental engineer and operator with 34 years of experience encompassing design and operation of advanced water and wastewater treatment systems, biological nutrient removal, reverse osmosis (RO) water treatment, biosolids management, master planning, wastewater process modeling and computer simulation. He has been involved in the design, startup, and operation of numerous advanced wastewater, water, and RO treatment projects throughout the United States. For Suez (previously known as United Water, Inc.) he was the Engineering Manager and Process Engineer for the 42-mgd West Basin Water Recycling Plant in El Segundo, California. Mr. Graham also served as Suez' Senior Director of Operations for the West Division and as Director of Technical Assistance for Suez nationwide assisting with operation, engineering, process troubleshooting, and facility startup activities.

Relevant Experience

→ Startup assistance for the San Luis Obispo County, California, 2.0-mgd Los Osos Wastewater Treatment Plant. Following construction and contractor turnover, Mr. Graham provided direction, process performance targets and operational strategy to improve the plant's performance and achieve compliance for effluent total nitrogen.

→ Project manager for the development of standard operating policies and procedures for the maintenance of water system operations facilities for the City of San Diego, California. These SOP included pump stations, pressure regulating stations, reservoirs/standpipes and altitude valves.

→ Project manager and project engineer for the Altamonte Springs, Florida, Advance Treatment Training. Carollo will provide supplemental training for the operations staff at the Altamonte Springs Regional Water Reclamation Facility.

→ Provided staff support for the San Elijo Joint Powers Authority, California, Outfall Replacement, the Encinitas Ranch Recycled Water Pipeline and the Preliminary Treatment Upgrades projects.

→ Operational process engineer for the MSKP Town and Country Utility, Florida, Babcock Ranch WRF SBR Upgrade and Conversion to MBR. Carollo was selected to evaluate, design, and provide construction management services for the Phase 2 design/build expansion, which will increase flow to 0.75-mgd and modify the treatment facility to an MBR system to reuse much of the existing treatment units.

→ Startup lead and operational support for the City of Oak Harbor, Washington, Clean Water Facility 2.0-mgd MBR treatment plant including solids handling, centrifuge dewatering and sludge drying, operator training and assistance in developing operating procedures.

→ Startup assistance for the City of Chandler, Arizona, 5.0-mgd MBR Ocotillo WRF Expansion. Provided operator training and assisted with seeding and monitoring of the new treatment train during the initial startup which achieved permitted effluent quality within five days from seeding.

→ Troubleshooting assistance for the City of Delray Beach, Florida, 24-mgd South Central Regional Wastewater Treatment Plant. As part of the aeration replacement project, the plant needed to take a quarter of the aeration basins offline; however, the plant was experiencing a major filamentous bulking event. Mr. Graham quickly developed an alternative process control strategy to reduce the impact of the bulking that allowed the plant to take down the required aeration basins for the aeration replacement project.

→ Process engineer and operations liaison overseeing the Process Design of the Sarasota County, Florida, Bee Ridge Water Reclamation Facility Expansion to 18-mgd. This project involves expansion of the facility from 12 to 18-mgd capacity and conversion to Advanced Wastewater Treatment (AWT).

The first phase of this project is for Preliminary Design services.

→ Process engineer for the City of Leesburg, Florida, Turnpike SBR Expansion from 3.0 to 4.5-mgd (AADF). Carollo, as a subconsultant to another firm, was selected to evaluate, design, and provide biding services for the expansion. The City later decided to include the Carollo team as part of a CMAR approach to build the expansion.

→ Process engineer for the Capacity Analysis of the Manatee County, Florida, 11-mgd Southeast Water Reclamation Facility. The project involved preparing and submitting the permit renewal application for the Florida Department of Environmental Protection.

→ Project manager for the City of San Diego, California, North City Water Reclamation Plant Landfill Gas Pipeline Project. The project included managing the design of the directional drill Rose Canyon Undercrossing.

Previous Experience

→ Technical assistance, operations support, and due diligence for the project start up and transition from municipal operation to contract operation, Nassau County, New York. Suez assumed the responsibility for operating and maintaining the Nassau County wastewater collection and treatment system. This system includes two large wastewater treatment plants (approximately 50 mgd each), the associated powerhouses, heating and cooling systems (boilers and chillers) and anaerobic digesters at each facility. Coordinated the development of over 500 standard operating procedures (SOP), the Interim Operating Plan, Operations Management Plan, Energy and Water Conservation Plan, Flow Monitoring Plan, Odor Control Plan, Residual Monitoring Plan, and Sampling Plan. These Plans and Procedures were contractual obligations and are necessary for using in operating the wastewater facilities. Developed and delivered these documents ahead of schedule and continued to assist in transitioning the project by training operators and identifying operational problems that needed correction for the plants to maintain environmental compliance.

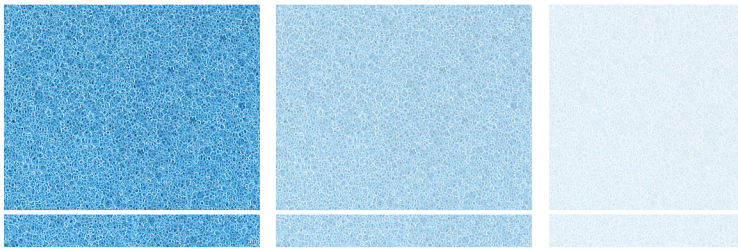
→ Wastewater process engineer for the City of Laredo, Texas, Zacate Creek Wastewater Treatment Plant (WWTP). Assisted the operations staff in improving the performance of the 14-mgd Zacate Creek WWTP. This plant consists of two separate trains: a trickling filter train and a contact stabilization train. The WWTP was scheduled for major renovation and rehabilitation in the fall of 2003 and was experiencing operational difficulty due to aging equipment and mechanical failures. Also, the contact stabilization train has a historical problem with Nocardia foaming that occurs during cold weather periods. Also assisted with process modifications to improve performance to eliminate the foam and maximize treatment performance.

→ Process engineer for the Orange County Sanitation District, California, Interim Strategic Plan for Update. Provided technical assistance to the update team in the areas of secondary treatment, nitrification, and disinfection. Provided process evaluation and treatment expertise to the 1998 Strategic Plan team.

→ Technical assistance, operations support, and due diligence for Suez West Basin Biofor™ biological aerated filtration nitrification process failure. Tasked with solving the process failure of the nitrification process at the West Basin Chevron facility. He was quickly able to identify that the problem was increased ammonia concentrations in the feed stream coupled with insufficient alkalinity caused by ferric chloride addition in the pre-treatment process and redesigned the chemical feed system at the nitrification process and added carbon dioxide feed for pH control. He then oversaw the construction of the changes in the field and directed the operation of the nitrification process until it had returned to full capacity.

→ Task leader for the City of San Diego, California, Water Treatment Plant Hydraulic Design. Responsible for the hydraulic design and provided technical review of the Miramar Water Treatment Plant expansion from 140 to 215 mgd.

carollo.com



carollo

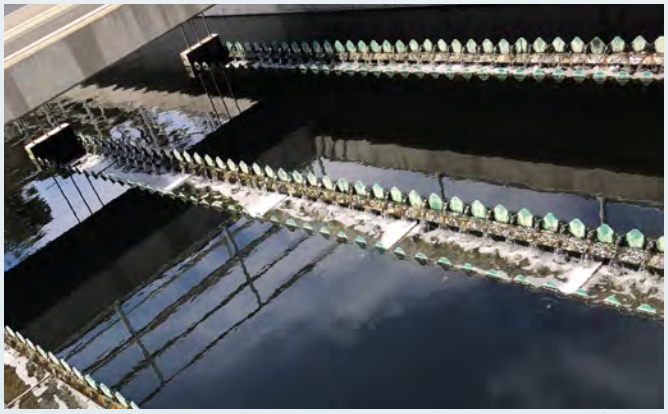
Engineers...Working Wonders With Water®

PREPARED FOR

SAN ELIJO | JOINT POWERS AUTHORITY

STATEMENT OF QUALIFICATIONS

DECEMBER 22, 2020



PREPARED BY

Trussell TECHNOLOGIES INC

December 22, 2020

San Elijo Joint Powers Authority
Michael Thornton
2695 Manchester Avenue
Cardiff by the Sea, CA 92007

Subject: Request for Qualifications to Provide Engineering Services for San Elijo

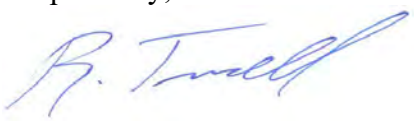
Dear Mr. Thornton,

We are pleased to submit the enclosed Statement of Qualifications to provide on-call engineering consulting services for the San Elijo Joint Powers Authority (San Elijo). Trussell Technologies, Inc. (Trussell Tech) is an engineering firm that specializes in process and water quality for a range of projects: including wastewater treatment, recycled water, advanced treatment for indirect and direct potable reuse, recovery of impaired groundwaters for potable applications, brine minimization and management alternatives, as well as seawater desalination. A California small business, Trussell Tech has offices in Solana Beach, Pasadena, and Oakland with more than thirty engineers to support San Elijo's needs. We are particularly interested in providing services relating to:

- Pure water design and permitting projects
- Activated sludge treatment optimization projects
- Operations and maintenance staff training
- Membrane treatment optimization projects
- Digester treatment optimization
- Recycled water and wastewater treatment projects, e.g. capital, process studies, energy studies
- Reservoir replacement or rehabilitation projects; and/or
- Master planning and/or operational studies

We have had the pleasure of working with San Elijo over the past decade on these types of projects and hope that you have been pleased with the results. We possess unmatched knowledge of San Elijo's facilities, vision, and long-term goals. We are excited to further optimize processes at the facility, educate and empower operations staff, and implement innovative solutions for complex issues. Our team offers a wealth of experience, is well rounded, and guaranteed to provide the most value for your projects. We look forward to this opportunity and encourage you to contact us with any questions.

Respectfully,



R. Shane Trussell, Ph.D., P.E., BCEE
President, Trussell Technologies, Inc.
shanet@trusselltech.com

OVERVIEW OF FIRM QUALIFICATIONS

Trussell Technologies (Trussell Tech) is an environmental engineering firm passionate about developing the best process and water quality solutions. This passion motivates us to tackle complex water challenges with the latest in practice and science. Together, we aim to deliver safe, sustainable water for generations to come.

OUR VISION IS TO BE THE WATER INDUSTRY'S MOST TRUSTED PARTNER BY DELIVERING INNOVATIVE AND SUSTAINABLE SOLUTIONS

Trussell Tech provides safe and sustainable solutions in water, wastewater, reuse, and desalination for our clients and partners. Together, we take projects from concept through implementation using past experience, applied research and treatability expertise, proven regulatory insight, cutting-edge treatment system design, and real-world operational knowledge. Our reputable team will use innovation to deliver high-quality services that reduce project costs and improve reliability.

OUR COMPANY

Trussell Tech's 33 engineers engage in a range of projects, including the evaluation, design, and permitting of processes for water recycling, potable reuse, drinking water, and wastewater. The firm is composed of energetic, highly trained women and men providing the right combination of experience and high-tech talent required to attack today's toughest challenges. Our breadth of services spans from planning and conceptual development to the testing, design, and permitting of full-scale facilities. Trussell Tech's design perspective is heavily informed by our involvement in the operation and optimization of existing treatment facilities.

Our engineers use experience with successful designs from the past to ensure future success, but when *new* problems arise, science must also play a critical role in problem solving. Trussell Tech operates in the nexus between practice and science, with 9 staff members holding Ph.D.s, 20 California-registered professional engineers, and 7 BCEEs.

OUR SERVICES AND EXPERTISE

Trussell Tech provides a myriad of services with the expertise to address a wide range of topics bridging water, wastewater, reuse, and desalination. Our services include regulatory and permitting assistance; feasibility studies and master plans; laboratory-, pilot-, field- and demonstration-scale treatment and optimization studies; design of full-scale treatment facilities; water quality assessment; source water watershed sanitary surveys; integration and corrosion mitigation assessment; start-up and commissioning, operations and operator training. Trussell Tech has extensive and varied experience with membrane filtration for reuse, reverse osmosis, advanced oxidation processes, disinfection, and post-treatment stabilization.

Trussell Tech is a California-focused company with unparalleled expertise in California treatment issues and regulations. Our firm has successfully completed projects throughout the State of California for a variety of municipal agencies.

Trussell Tech is a leader in water reuse and bring a proven track record of successfully executing California's potable reuse projects. Our efforts have promoted dialogue between regulators, the water industry, and the public for all aspects of reuse. We have worked with municipal agencies at every level of treatment planning and implementation, from pilot testing and design, to procurement, permitting, engineering services during construction, and facility process optimization. Trussell Tech understands what drives the successful implementation of potable reuse projects in California, including treatment process design, a sound regulatory approach, and effective public outreach. Our reuse planning and design work is always informed by our experience from also operating advanced treatment facilities – providing insight that is key to improving performance and reducing the cost of water.

COMPANY INFORMATION
LEGAL NAME TRUSSELL TECHNOLOGIES, INC.
LOCAL SAN DIEGO COUNTY OFFICE 380 STEVENS AVE., SUITE 212 SOLANA BEACH, CA. 92075 858-458-1030
OAKLAND OFFICE 1939 HARRISON ST, SUITE 600 OAKLAND, CA 94612 510-457-2200
PASADENA OFFICE 232 N. LAKE AVE, SUITE 300 PASADENA, CA 91101 626-486-0560
WEBSITE WWW.TRUSSELLTECH.COM
YEARS IN BUSINESS 17 (FOUNDED IN 2003)
NUMBER OF EMPLOYEES 41

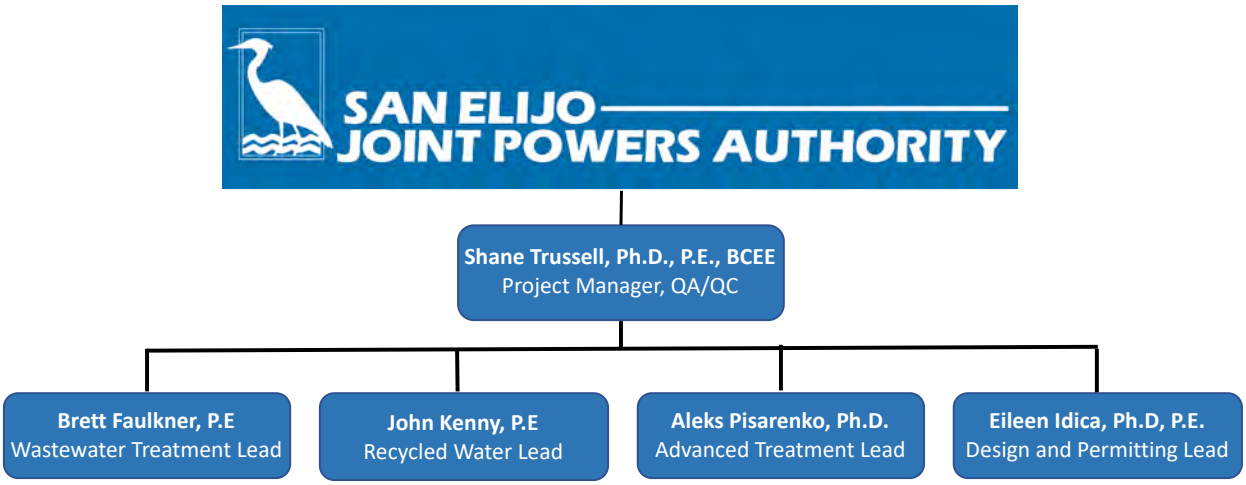
Trussell Tech has been leading the industry through numerous projects focused on recycled water and alternative water supplies. These projects include: long-term support for the San Diego Pure Water Program (both Phase 1 covering North City facilities and Phase 2 covering the central area facilities), Pure Water Monterey, East County Advanced Water Purification Project, and Pure Water Oceanside. Other notable recent projects include key support of the Metropolitan Water District's Regional Recycled Water Advanced Purification Center 0.5 MGD demonstration facility, City of Los Angeles's Terminal Island Water Reclamation Plant and Advanced Water Purification Facility and Donald C. Tillman Groundwater Replenishment project.

QUALIFICATIONS OF KEY PERSONNEL

THE PROJECT TEAM

This section presents the organization of our project team along with the qualifications of our key personnel. Shane Trussell will be the key contact with San Elijo. He is a recognized industry leader in water treatment, wastewater/recycled water, ocean desalination, potable reuse, and regulatory compliance. The organization chart, shown below, outlines the key personnel/leads for specific topic areas of on-call services. Shane Trussell will serve as the Project Manager. He will be responsible for streamlining communications with San Elijo and have complete oversight of the on-call projects. Shane will also serve as quality assurance/quality control (QA/QC) on any deliverables to be produced for San Elijo. The organization chart is broken into four main project specialties—wastewater, recycled water, advanced treatment, and design/permitting. Each respective specialty includes a highly qualified and experienced lead engineer within their designated specialty. This structure allows the City to leverage our expertise on a case-by-case basis depending on the specific nature of the given on-call project. Furthermore, the lead engineers will utilize additional engineering staff within the company to ensure that all projects and tasks will be managed and executed in a timely and efficient manner once initiated by the San Elijo.

ORGANIZATIONAL CHART



AREAS OF EXPERTISE FOR KEY PERSONNEL

Our team will bring a versatile skillset to meet San Elijo's needs, as demonstrated by the summary table below. All key personnel are California focused, with extensive understanding of the wastewater, recycled water, and potable reuse challenges specific to the region. For example, prolonged drought conditions and high reliance on imported water heightens the need for municipalities to develop safe, sustainable, innovative, and cost-effective solutions. We commend San Elijo for being on the forefront of the industry by optimizing wastewater treatment performance and efficiency, maximizing recycling of wastewater for non-potable reuse, enhancing recycled water quality with advanced treatment technologies, and proactively pursuing potable reuse opportunities. Given the diversity and complexity of San Elijo's wastewater, recycled water, and potable reuse needs, we are confident that our expertise will be of great benefit.

Summary of Key Personnel Expertise

Key Personnel	Wastewater Treatment	Recycled Water	Advanced Treatment	Operator Training	Plant/Process Evaluations and Specialized Studies	Process Optimization	Master/Capital Improvement Planning	Cost Evaluation	Permitting
Shane Trussell	✓	✓	✓	✓	✓	✓	✓	✓	✓
Brett Faulkner	✓	✓	✓	✓	✓	✓	✓	✓	
John Kenny	✓	✓	✓		✓	✓	✓	✓	✓
Aleks Pisarenko		✓	✓	✓	✓	✓	✓	✓	
Eileen Idica		✓	✓		✓	✓	✓	✓	✓

KEY PERSONNEL

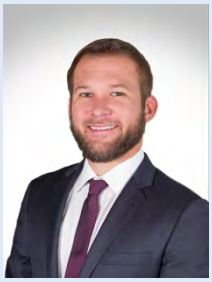
Bios that summarize the credentials for each of the key personnel are provided below. Additional information for each team member can be found in *Appendix A: Resumes*.

Shane Trussell, Ph.D., P.E., BCEE

Civil Engineer, State of California - No. 66887
Board Certified Environmental Engineer - No. 11-10042 (Water Supply and Wastewater)
20+ Years of Experience
Ph.D., Environmental Engineering, University of California, Berkeley
M.S., Environmental Engineering, University of California, Los Angeles
B.S., Chemical Engineering, University of California, Riverside

Shane is a nationally-recognized industry leader in municipal treatment process and the application of treatment to provide creative, technically sound solutions for public agencies. Dr. Trussell has been involved in over 12 potable reuse projects throughout the state, ranging from feasibility studies and pilot testing to the design, plant operation, and commissioning of full-scale projects. He has been a key figure in helping agencies work with the state regulators to permit potable reuse projects, from groundwater replenishment to surface water augmentation. Shane is well versed at managing projects and understands the linkages between different components required to achieve successful implementation. As president and chief executive officer of Trussell Tech, he also is responsible for guiding the company's commitment to furthering the industry's knowledge to solve today's challenges.

Brett Faulkner, P.E.



Civil Engineer, State of California – No. 87912
Grade III Wastewater Treatment Plant Operator – Certificate Number 41525
10+ Years of Experience
M.S. Civil and Environmental Engineering, San Diego State University
B.S. Civil and Environmental Engineering, University of Colorado, Boulder

Brett Faulkner has over 10 years of experience working as an environmental engineer in California and specializes in wastewater and advanced treatment with an emphasis on process optimization and operations. Brett also operated the City of San Diego Pure Water Demonstration Facility as a certified Grade 3 wastewater operator in the State of California for 2 years. Brett is skilled in GPS-X, a dynamic wastewater simulation modeling software, and has utilized biological modeling to assist in the evaluation, optimization, and/or sizing of biological treatment processes at over 10 facilities ranging from 3 to 300 MGD. Brett also provides operational support and on-call engineering services for five wastewater agencies in California including San Elijo. Brett has worked closely with San Eljio over the past 10 years to develop and refine the SEWC operations plan, optimize treatment performance and efficiency, provide operator training, and conduct various specialized studies and evaluations.

John D. Kenny, P.E.

Civil Engineer, State of California – No. 82975
9+ years of experience
M.S., Civil and Environmental Engineering, University of California, Berkeley
B.S., Civil, Environmental, and Architectural Engineering, University of Kansas

John is a Supervising Engineering and process and water quality expert with over eight years of experience with Trussell Tech. John leverages operational and engineering experience with applied problem solving and fundamentals to develop optimized solutions for advanced wastewater treatment.

John Kenny is a process and water quality expert with Trussell Technologies, Inc., with particular focus on potable reuse and recycled water. He is the lead process engineer and regulatory strategist for the Pure Water Monterey project, a 5 mgd groundwater replenishment reuse project utilizing ozonation upstream of membrane filtration. He has also worked with the California Division of Drinking Water to implement novel tertiary treatment approaches such as granular media filtration rates greater than 5 gpm/sf and free chlorine disinfection at CTs less than 450 mg-min/L, allowing facilities to increase capacity with minimal infrastructure. Mr. Kenny leverages both science and experience to solve emerging water quality issues and enjoys finding elegant solutions to complex problems.

Eileen Idica, Ph.D, P.E.

Civil Engineer, State of California - No. 79662
12+ Years of Experience
Ph.D., Civil and Environmental Engineering, University of California, Los Angeles
M.S., Civil and Environmental Engineering, University of California, Los Angeles
B.S., Civil and Engineering, University of California, Berkeley

Eileen is a principal engineer with Trussell Tech with over ten years of experience working on projects throughout California. She has worked on a variety of topics, with an emphasis on treatment process technologies for both drinking and recycled water and their associated regulatory considerations, particularly with the Division of Drinking Water. Her experience ranges from feasibility studies to design, as well as engineering reports and technical process optimization evaluations of existing facilities and systems. Leveraging the depth of technical knowledge in the industry from both the past and cutting-edge present along with her own direct experience, Eileen will be able to efficiently provide comprehensive technical recommendations for the San Elijo Joint Powers Authority based in data, science, and engineering.

Aleks Pisarenko, Ph.D.

Grade V Wastewater Treatment Plant Operator – Certificate Number 41526
16+ Years of Experience
Ph.D., Chemistry, Miami University, Oxford, OH
B.S., Chemistry, York College of Pennsylvania

Dr. Pisarenko brings over 16 years of experience in the design, operation, and testing of advanced treatment technologies and is a certified Grade 5 Wastewater Operator, with over 5 years of experience in advanced water treatment operation and maintenance. Dr. Pisarenko managed the operation and maintenance of the City of San Diego's 1 MGD PWDF from 2013 to 2017. During this time, Dr. Pisarenko routinely inspected and maintained the MF and RO systems and ancillary equipment to ensure proper operation. While operating and maintaining the facility, Dr. Pisarenko and the Trussell staff worked with the City to optimize RO pre-treatment chemicals, investigate RO oxidation protection methods, and optimize chloramine use for more efficient control of membrane fouling. Dr. Pisarenko and the Trussell team also developed training modules, which included a combination of classroom and hands-on training activities, preparing the City to take over operations and maintenance duties for the PWDF in 2017. Dr. Pisarenko will leverage his design, operations and maintenance, and testing experience to provide technical guidance and support for the aspects related to advanced treatment for San Elijo. Since 2013, Dr. Pisarenko has assisted San Elijo with routine technical support for the MF/RO processes at SEWC and recently facilitated the procurement and replacement of the RO membranes.

RELATED PROJECT EXPERIENCE OF KEY PERSONNEL AND FIRM

Our staff has a wealth of recent related experience, as summarized for select projects in the table below. Project descriptions are also provided that outline Trussell Tech's responsibilities and the work performed for each project. Only projects that our key personnel were heavily involved in are included to showcase their related experience. Furthermore, the select projects exemplify our firm's overall qualifications. Trussell Tech has assisted clients with many operational and engineering services related to wastewater, recycled water, and potable reuse. Many of our projects involve process optimization, specialized studies, capital improvement planning, cost evaluations, permitting, and design. Using knowledge gained through our experience, we are particularly well-suited to execute cost effective and reliable solutions for San Elijo.

SUMMARY OF AREAS OF EXPERTISE FOR SELECT RELEVANT PROJECTS

Client	Project	Wastewater Treatment	Recycled Water	Advanced Treatment	Operator Training	Plant/Process Evaluations and Specialized Studies	Process Optimization	Master/Capital Improvement Planning	Cost Evaluation	Permitting
San Elijo Joint Powers Authorities	Previous Engineering Services	✓	✓	✓	✓	✓	✓	✓	✓	
City of Santa Barbara	Technical Support for Operation of Secondary and Tertiary Treatment Processes	✓	✓	✓		✓	✓			
Vallecitos Water District	As-Needed Engineering Services	✓	✓			✓	✓	✓	✓	
Western Municipal Water District	Chlorine Disinfection Permitting, Operations Support	✓	✓			✓	✓			✓
Monterey One Water	AWPF Design			✓	✓	✓	✓	✓	✓	✓
City of San Diego	Tertiary Filter Capacity Evaluation and Pathogen Study	✓	✓			✓	✓	✓		✓
City of San Diego	Pure Water Program	✓		✓	✓	✓	✓	✓	✓	✓
Padre Dam / East County AWP JPA	East County AWP Project	✓	✓	✓	✓	✓	✓	✓	✓	✓
City of Oceanside	Pure Water Oceanside / As-needed Process Optimization	✓	✓	✓	✓	✓	✓		✓	✓

Technical Support of Operation and Maintenance of Tertiary Membrane Filtration at the El Estero Water Resource Center

Client: City of Santa Barbara
Primary Contact: Amanda Flesse, Wastewater System Manager
Phone Number: (805) 564-5412
Address: 630 Garden Street, Santa Barbara, CA, 93101
Email: AFlesse@SantaBarbaraCA.gov
Date: 2016 – Present

KEY STAFF AND ROLE	RESPONSIBILITIES
Shane Trussell, Project Manager	Project Management, Technical and Operational Support
Brett Faulkner, Project Engineer	Data Analysis, Operational Support, Biological Modeling
Aleks Pisarenko, Project Engineer	Technical Support

In January of 2016, the City of Santa Barbara (the City) commissioned a 2.5 MGD tertiary facility to produce recycled water using membrane filtration (MF). After experiencing issues with MF production, the City retained Trussell Tech to ensure that recycled water requirements are reliably achieved. Trussell Tech worked with operations staff to optimize the MF system by improving cleaning procedures, backwash sequencing, and recommending and implementing modifications to the MF system. Trussell Tech coordinated discussions between the City, the MF system supplier, and the system integrator to implement modifications and optimize the MF system. Through this effort, the City was able to double their effective production through the MF system and meet all recycled water demands.

MF Skid at the EEWTP

Trussell Tech has since been providing routine operational support, which include weekly analyses of performance and water quality data from the secondary and tertia ry treatment processes. These analyses are presented to the City in weekly conference calls; and operational recommendations are discussed. By continuously working with El Estero Water Resource Center operations staff, feedwater quality has improved dramatically from the upstream secondary process, and the tertiary MF process has been reliably meeting recycled water demands. Trussell Tech has also assisted the City on other as-needed tasks, including troubleshooting the autostrainers upstream of the MF system and optimizing plant performance throughout a secondary treatment conversion to a nitrifying process.

Meadowlark Water Reclamation Facility As-Needed Engineering Services

Client: Vallecitos Water District
Primary Contact: Dawn McDougle, Wastewater Treatment Plant Supervisor
Phone Number: (760) 744-0460
Address: 201 Vallecitos De Oro, San Marcos, CA, 92069
Email: dmcdougle@vwd.org
Date: 2010 – Present

KEY STAFF AND ROLE	RESPONSIBILITIES
Shane Trussell, Project Manager	Project Management, Technical Support, QA/QC
Brett Faulkner, Project Engineer	Operational Support, Biological Modeling, Filter Media and Aeration Basin Equipment Design Lead
Eileen Idica, Project Engineer	Filter Media Design, QA/QC

The Vallecitos Water District (VWD) owns and operates the Meadowlark Water Reclamation Facility (MWRF), which is capable of treating up to 5 MGD of wastewater to produce recycled water for local customers. Since 2010, Trussell Tech has worked with the VWD on an assortment of projects including operational support/optimization, filter media design and replacement, coliform evaluation, disinfection system design, secondary process optimization, nutrient removal assessment, and aeration basin equipment preliminary and final design.

In 2017, Trussell Tech completed an evaluation and preliminary design that assessed the viability, benefits, and cost associated with retrofitting the existing aeration basins at the MWRF with biological selectors. There are anticipated operational and treatment benefits associated with the selectors, including biological phosphorus removal and reductions in sludge bulking and chemical coagulant dosing for tertiary filtration. The anaerobic selector zones at the beginning of each aeration basin will be created using non-structural baffles; a compressed gas system will provide mixing with minimal oxygen transfer. Another component of the upgrade is the aeration equipment: the unreliable existing panels will be replaced because they are no longer supplied by the manufacturer. Therefore, new fine bubble diffusers will also be installed. In 2019 Trussell Tech developed design documents (i.e., specifications and drawings) for the diffusers, mixing system, and non-structural baffle retrofits. Finally, Trussell Tech retained the services of Ewing Construction Services to create a Level 2 Opinion of Probable Construction Cost, so the Vallecitos Water District can secure an appropriate budget for the project and gauge bid submittals. Trussell Tech will assist VWD with review of bid submittals from contractors and provide engineering services during construction to ensure the design specifications and performance requirements are met.

In 2015, Trussell Tech designed replacement granular media for the MWRF's filters, developed the technical specifications, and provided construction and operations support during the media replacement. Historically, high doses of coagulant were relied upon to meet Title 22 filter effluent turbidity limits. Trussell Tech identified that the filter media was inadequately sized for effective turbidity removal, so a finer media consisting of sand and anthracite was selected. The media was sized to lower turbidity by achieving fluidization and stratification with the existing backwash rates. Upon determining the preferred media design, Trussell Tech provided technical specifications that described the media and requirements for proper testing and installation. Trussell Tech also performed sieve analyses on the replacement media prior to installation to ensure that it met the design specifications. Trussell Tech provided support throughout the installation process by inspecting the underdrains, removing fines, and providing media installation procedures. The new media has reduced coagulant use by 95% and dramatically improved filter performance.

Filter Media Replacement at MWRF

Chlorine Disinfection Regulatory Approval, Control Logic, and Operational Support

Client: Western Municipal Water District
Primary Contact: Tony Pollak, Wastewater Operations Manager
Phone Number: (951) 757-6929
Address: 16451 El Sobrante Road, Riverside, CA 92503
Email: Tpollak@wmwd.com
Date: 2017 – Present

KEY STAFF AND ROLE	RESPONSIBILITIES
Shane Trussell, Technical Advisor	Technical Review and QA/QC
Brett Faulkner, Project Engineer	Operational Support
John Kenny, Project Engineer	Regulatory Support, Chlorination Expert

The Western Riverside County Regional Wastewater Authority (WRCRWA) owns the Western Riverside County Regional Water Treatment Plant (WRCRWTP), which is operated by Western Municipal Water District (WMWD). The WRCRWTP recently expanded, which included the conversion of the disinfection process to chlorine-based disinfection. In 2017, Trussell Tech demonstrated to the State Water Resources Control Board Division of Drinking Water the modal contact time of the chlorine contact basins for the WRCRWA plant expansion project. Developed a test plan; obtained test plan approval from DDW; prepared for and conducted tracer tests with team; analyzed results; prepared final report; and obtained approval from DDW.

In 2019, WRCRWA retained Trussell Tech to optimize the WRCRWTP's disinfection process by updating the chlorine narrative and providing operational support. Trussell Tech incorporated online ammonia analyzers into the sodium hypochlorite dosing controls to ensure reliable CT levels for disinfection. Trussell Tech also routinely analyzes process data and provides operational support to the district with the goal of reducing chemical use and improving treatment efficiency. Trussell Tech will be providing an additional 12 months of operational support starting July 2020 to continue supporting operations staff and to help implement additional improvements to the nitrification, chlorination, and dichlorination processes at WRCRWTP.

Secondary Clarifier at WRCRWTP

Tertiary Filter Capacity Evaluation and Pathogen Study

Client: City of San Diego
Primary Contact: Margaret Llagas, Senior Civil Engineer
Phone Number: (858) 654-4494
Address: 9192 Topaz Way, San Diego, CA 92123
Email: mllagas@sandiego.gov
Date: 2016 – 2020

KEY STAFF AND ROLE	RESPONSIBILITIES
Shane Trussell, Project Manager	Technical Advisor and QA/QC
John Kenny, Project Engineer	Lead engineer for all project components from pilot testing through design, startup, and optimization

The City of San Diego is in the process of expanding the North City Water Reclamation Plant (NCWRP) in order to supply feed water to a new Advanced Water Purification Facility (AWPF) which will be used to augment the region's water supply portfolio. Trussell Tech was consulted to evaluate the capacity of the filters and to determine the removal of pathogens across the NCWRP treatment process.

California's Water Recycling Criteria limit tertiary filtration rates to 5 gallons per square foot per minute (gpm/sf); however, Trussell Tech has previously shown that equivalent water qualities can be produced at a higher filtration rate of 7.5 gpm/sf. Based on the results at 7.5 gpm/sf Trussell Tech conducted additional full-scale filtration rate testing to demonstrate reliable performance at the filter loading rates up to 8.7 gpm/sf. The higher loading rate would increase the capacity of the NCWRP tertiary filters by, allowing NCWRP to build less infrastructure during the expansion. As of 2020, DDW has conditionally approved the higher filtration rates of 8.7 gpm/sf based on the high filter rate test report submitted by Trussell Tech.

Filter at NCWRP

Pure Water San Diego

Client: City of San Diego
Primary Contact: Margaret Llagas, Senior Civil Engineer
Phone Number: (858) 654-4494
Address: 9192 Topaz Way, San Diego, CA 92123
Email: mllagas@sandiego.gov
Date: 2013 – Present

KEY STAFF AND ROLE	RESPONSIBILITIES
Shane Trussell, Project Manager	Project Manager, Technical Advisor, and QA/QC
Aleks Pisarenko, Project Engineer	Lead engineer of multiple research, testing, prequalification, and design tasks, demo facility operations and maintenance lead
Brett Faulkner, Project Engineer	Demo facility operations and maintenance
Eileen Idica, Project Engineer	Permitting support, design review

The goal of San Diego's Pure Water Program is to develop a 30-mgd capacity potable reuse water purification facility that is operational by 2021 with a long term goal of having one-third of San Diego's drinking water supply (approximately 83 mgd) be purified potable reuse water. Trussell Technologies history with the Program started with operation of the 1 mgd demonstration facility in 2013 and construction of the 1.6 mgd ozone and biologically active carbon filters. Since then, Trussell Technologies has led several studies at the demonstration facility that have ultimately enhanced the design of the full-scale 30 mgd North City Pure Water Facility. Recently Trussell Technologies passed operations back to the City staff, and have been facilitating the transfer with operational training and support.

On a team with MWH and Brown and Caldwell, Trussell Technologies led the treatment process decisions for the 10% and 30% design, which included ozone, biologically active filtration, microfiltration/ultrafiltration, reverse osmosis, and UV advanced oxidation processes. The City hired Carollo to perform the final design, and Trussell Technologies reviewed the design documents at major milestones, to ensure that the facility continues to be on track for DDW approval and meets the intent of the earlier designs for ease of operability and reliable treatment.

Demonstration Pure Water Facility – Ozone/BAC

Trussell Technologies has and will continue to play key roles in all aspects of the San Diego Pure Water Program, including equipment prequalification and preselection, final design, construction commissioning, regulatory permitting, and treatment process optimization studies.

Monterey One Water AWPF Design

Client: Monterey One Water
Primary Contact: Bob Holden, Principal Engineer
Phone Number: (831) 883-6132
Address: 5 Harris Ct., Monterey, CA, 93940
Email: bobh@my1water.org
Date: 2017 – Present

KEY STAFF AND ROLE	RESPONSIBILITIES
Shane Trussell, Principal In-Charge	Technical Advisor and QA/QC
John Kenny, Lead Engineer	Lead engineer for all project components from pilot testing through design, startup, and optimization

In order to augment the region's potable water supply, Monterey One Water (M1W) contracted with Trussell Tech to develop a 5-mgd Advanced Water Purification Facility (AWPF). The project involves treating challenging secondary effluent from M1W's Regional Treatment Plant through an advanced treatment train and then injecting the highly purified water into the Seaside Groundwater Basin. Trussell Tech has been involved since treatability testing began in 2012 to the present-day startup and commissioning.

Trussell Tech conducted bench-scale testing to determine the most effective treatment train and pilot-scale testing to generate a basis of design for the full-scale project. The treatment train includes ozonation, membrane filtration (MF), reverse osmosis (RO), ultraviolet light with hydrogen peroxide advance oxidation (UV/AOP), and post- treatment stabilization.

Trussell Tech supported development of the basis of design, as well as 30%, 60%, and 100% level of designs for the APWF. Trussell Tech served as the process lead for design of the ozonation system, UV/AOP system, post-treatment stabilization, system, and chemical storage and delivery systems. Trussell Tech also lead preselection of the ozonation and UV/AOP equipment. Trussell Tech provided shop drawing review, prepared sections of the operation and maintenance (O&M) Manual and conducted operator training as part of the engineering services during construction. Currently, Trussell Tech is supporting startup and commissioning of the ozonation, UV/AOP, posttreatment stabilization, and chemical delivery systems. Trussell Tech will also support M1W with process optimization of the AWPF once startup is completed.

Trussell Tech also supported M1W in designing a demonstration facility for public outreach. Trussell Tech provides operation and maintenance support for all processes at the demonstration facility, which mimics AWPF the treatment train. Trussell Tech has used the demonstration facility to train operators and optimize treatment performance including ozone doses, flux rates, membrane cleaning Standard Operating Procedures, and maintenance of real-time analyzers.

M1W AWPF

Trussell Tech assisted M1W with permitting efforts including California Environmental Quality Act (CEQA) support, development of the Engineering Report for the State Water Resources Control Board Division of Drinking Water (DDW), obtaining the Waste Discharge Requirements and Water Recycling Requirements (WDR/WRR) permit, assessment of Ocean Plan compliance for M1W's amended National Pollutant Discharge Elimination System (NPDES) permit, preparation of the Operation Optimization Plan (OOP) for DDW, and review of the AOP Test Plan and report for DDW. The Engineering Report, WDR/WRR permit, amended NDPES permit, OOP, and AOP Test Plan and report have all been approved by the regulators. Trussell Tech also assisted with geochemical leaching analysis to assess injected groundwater quality.

East County Advanced Water Purification Project

Client: Padre Dam Municipal Water District
Primary Contact: Seval Sen
Phone Number: (619) 258-4631
Address: 9300 Fanita Pkwy, Santee, CA 92071
Email: ssen@padre.org
Date: 2013 – Present

KEY STAFF AND ROLE	RESPONSIBILITIES
Shane Trussell, Principal In-Charge	Technical Advisor, QA/QC, project management
Eileen Idica, Project Manager	Project management, preliminary design lead, permitting support lead
Brett Faulkner, Project Engineer	Demo facility testing, operator training

Padre Dam Municipal Water District is pursuing the expansion of its recycled water program through the East County Advanced Water Purification Program to (1) produce up to 30% of the East County's potable supply (2) produce potable water at a cost less than imported water in the long run, and (3) achieve wastewater treatment cost less than the City of San Diego's Metropolitan Wastewater System.

Trussell Technologies has worked with Padre Dam since 2013, first with the design of their 100,000 gpd demonstration facility with Kennedy/Jenks as a subconsultant. Trussell Technologies then led the yearlong testing effort of the facility to demonstrate to the Division of Drinking Water and an independent advisory panel increased pathogen removal through the treatment process would compensate for the shorter groundwater retention time. Padre Dam became the first agency to achieve conceptual approval of the minimum 2-month retention time allowed by the regulations.

ADPF Demo Facility

Trussell Technologies continues to work with Padre Dam as the process design and regulatory lead for the Program. The Program is currently in the design phase and will include a new water reclamation plant (16 MGD), new advanced water purification facilities (12.5 MGD), and solids handling facilities.

Pure Water Oceanside / As-Needed Process Optimization

Client: City of Oceanside
Primary Contact: Cari Dale, Water Utilities Director
Phone Number: (760) 435-5800
Address: 300 North Coast Hwy, Oceanside, CA 92054
Email: CDale@ci.oceanside.ca.us
Date: 2019 – Present

KEY STAFF AND ROLE	RESPONSIBILITIES
Shane Trussell, Project Manager	Project management, technical advisor, Regulatory lead
Brett Faulkner, Project Engineer	Wastewater operational support
Aleks Pisarenko, Project Engineer	AWT processes, training
John Kenny, Project Engineer	Filtration lead
Eileen Idica, Deputy Project Manager	Treatment optimization, regulatory support

Trussell Tech has a long history with the City of Oceanside, supporting their indirect potable reuse concept and feasibility since 2016. Most recently, Trussell Tech has been retained by the City to support it's four main treatment facilities with as-needed process optimization, including two wastewater facilities, one drinking water filtration plant, and one brackish groundwater desalter. Trussell Tech has supported the City with considerations on their ocean outfall NPDES permit, a high rate filration study at the Weese Filtration Plan, and recommendations for dissolved oxygen control at the San Luis Rey Water Reclamation Facility.

Additionally, the City is currently in construction of the Pure Water Oceanside facilities, which include expansion of the Plant 2 wastewater facility to a nitrification-denitrification process, a 4.5-mgd production capacity advanced water treatment facility, conveyance pipelines, and injection wells to the Mission Basin groundwater aquifer for indirect potable reuse. The advanced water treatment facility will include membrane filtration, reverse osmosis, UV/AOP, free chlorine disinfection, and post-stabilization. Pure Water Oceanside is on track to inject water by the end of 2021. Trussell Tech is responsible for completing the Optimization Operation Plan, as required by the Division of Drinking water, conducting AWT training for the operators who have both water and wastewater backgrounds, support for startup and commissioning, particularly with DDW-required items such as UV/AOP challenge testing and DDW inspection. Once the facility is online, Trussell Tech will partner with Geoscience to conduct the required groundwater tracer study to verify underground retention time.

REFERENCES

Key Personnel Reference: Shane Trussell	
Client:	City of Oceanside
Primary Contact:	Cari Dale, Water Utilities Director
Phone Number:	(760) 435-5800
Address:	300 North Coast Hwy, Oceanside, CA 92054
Email:	CDale@ci.oceanside.ca.us
Key Personnel Reference: Brett Faulkner	
Client:	Vallecitos Water District
Primary Contact:	Dawn McDougle, Wastewater Plant Supervisor
Phone Number:	(760) 744-0460 Ext 400
Address:	7941 Corintia St, Carlsbad, CA 92009
Email:	dmcdougle@vwd.org
Key Personnel Reference: John Kenny	
Client:	Monterey One Water
Primary Contact:	Bob Holden, Principal Engineer
Phone Number:	(831) 883-6132
Address:	5 Harris Ct., Monterey, CA. 93940
Email:	bobh@my1water.org
Key Personnel Reference: Eileen Idica	
Client:	Padre Dam Municipal Water District
Primary Contact:	Seval Sen, Engineer
Phone Number:	(619) 258-4631
Address:	9300 Fanita Pkwy, Santee, CA 92071
Email:	ssen@padre.org
Key Personnel Reference: Aleks Pisarenko	
Client:	City of San Diego
Primary Contact:	Margaret Llagas, Senior Civil Engineer
Phone Number:	(858) 654-4494
Address:	9192 Topaz Way, San Diego, CA 92123
Email:	mllagas@sandiego.gov

ISSUES

Trussell Tech has no issues to San Elijo's contract language at this time. Furthermore, Trussell Tech is in compliance with the insurance requirements.

TRUSSELL TECHNOLOGIES, INC.
HOURLY BILLING RATES

Effective: December 21, 2020

	Standard Billing Rates		San Elijo Joint Powers Authority Discounted Billing Rates	
	Normal Hourly Rate[1]	Expert Daily Rate[2]	Normal Hourly Rate[1]	Expert Daily Rate[2]
Senior Company Officer	$ 345	$ 4,140	$ 311	$ 3,726
Principal Engineer III	$ 320	$ 3,840	$ 288	$ 3,456
Principal Engineer II	$ 290	$ 3,480	$ 261	$ 3,132
Principal Engineer I	$ 270	$ 3,240	$ 243	$ 2,916
Supervising Engineer III	$ 250	-	$ 225	-
Supervising Engineer II	$ 235	-	$ 212	-
Supervising Engineer I	$ 220	-	$ 198	-
Senior Engineer III	$ 200	-	$ 180	-
Senior Engineer II	$ 190	-	$ 171	-
Senior Engineer I	$ 180	-	$ 162	-
Engineer II	$ 170	-	$ 153	-
Engineer I Senior Office Manager II	$ 155	-	$ 140	-
Associate Engineer II Senior Office Manager I	$ 145	-	$ 131	-
Associate Engineer I Office Manager III	$ 140	-	$ 126	-
Assistant Engineer II Office Manager II	$ 130	-	$ 117	-
Assistant Engineer I Office Manager I	$ 115	-	$ 104	-
Office / Lab Assistant II	$ 110	-	$ 99	-
Office / Lab Assistant I	$ 95	-	$ 86	-

1. Time will be billed in 15 minute increments
2. Time will be billed in increments of one day

Other Direct Costs
Mileage for vehicle use to be reimbursed at current IRS rate. Travel, equipment rental and other direct costs to be reimbursed at actual cost plus 5%.

Outside Professional Services:
Outside professional services to be reimbursed at actual cos plus 15%

APPENDIX A
RESUMES

R. Shane Trussell, Ph.D., P.E., BCEE

EDUCATION

Ph.D. Civil and Environmental Engineering, *University of California, Berkeley*

M.S., Civil and Environmental Engineering, *University of California, Los Angeles*

B.S., Chemical Engineering, *University of California, Riverside*

REGISTRATION

Civil Engineer, State of California – No. 66887

CERTIFICATIONS

Board Certified Environmental Engineer, American Academy of Environmental Engineers – No. 11-10042
Specialty: Water Supply & Wastewater

SUMMARY

Dr. Trussell is a registered Civil Engineer in the State of California with more than 20 years of hands-on experience with membrane processes for desalination and filtration. Dr. Trussell has authored more than 65 publications and presentations. He has focused on advanced wastewater and water treatment processes, particularly, membrane filtration, membrane bioreactors, reverse osmosis, electrodialysis, ion exchange, granular activated carbon adsorption and disinfection with ozone, chlorine and chloramines. Dr. Trussell has been and is involved in 11 potable reuse projects throughout the state, ranging from feasibility studies and pilot testing to design and regulatory permitting. *Including the Pure Water Monterey bench-, pilot-, and demonstration-scale testing and basis of design for the MRWPCA.* Dr. Trussell is also the lead of two major research efforts funded by the WateReuse Research Foundation: WRRF 11-02 (Equivalency of Advanced Treatment Trains for Potable Reuse) and WRRF 14-12 (Demonstrating Redundancy and Monitoring to Achieve Reliable Potable Reuse), with a combined project budget total of $3.4 million, to advance the status of potable reuse in California. *In addition is part of a team to support Phase I of Padre Dam Municipal Water District's East County Regional Potable Reuse Program, which is looking to replace a minimum of 15% of East County San Diego's drinking water supply with potable reuse.* Dr. Trussell is an industry leader in potable reuse and developing water supplies, leading innovative and effective engineering and research projects throughout California.

PROJECT EXPERIENCE *(Select Projects)*

East Valley Water District

Title: Sterling Natural Resource Center MBR Design
Year: 2018–Present

The Sterling Natural Resource Center (SNRC) is a state-of-the-art, 8 mgd water reclamation facility that will provide the East Valley Water District (EVWD) a new water supply that meets Title 22 regulatory requirements for unrestricted reuse. The project will incorporate biological treatment using membrane bioreactors (MBR) followed by ultraviolet (UV) disinfection under a progressive design-build delivery model. Trussell Tech has been responsible for the design and equipment selection of the MBR and UV systems. Additionally, Trussell is providing regulatory support to EVWD to obtain permits from the Regional Water Quality Control Board.
Role: *Project Manager*

City of San Diego/Stantec

Title: Pure Water San Diego Program
Year: 2015 – Present

Trussell Technologies, Inc. is part of a consulting team, including Stantec (formerly MWH) and Brown and Caldwell, working with the City of San Diego to implement the Pure Water Program. The goal of the Pure Water Program is to develop a 30 MGD capacity potable reuse water purification facility that is operational by 2021, and with a long-term goal of replacing one-third of San Diego's drinking water supply (approximately 83 MGD) with purified potable reuse water. Trussell Technologies is currently providing regulatory

guidance for permitting potable reuse facilities for source water augmentation, predesign of the North City Advanced Water Purification Facility (NCAWPF) for two treatment train options, and pre-qualification and pre-selection testing for major equipment capital purchases including the MF/UF, RO, and UV/AOP systems. Dr. Trussell is leading the regulatory effort, including interfacing with the independent project advisory panel and working with experts and the City to develop a sound strategy for permitting the future facilities.

Role: *Project Manager*

Monterey Regional Water Pollution Control Agency (MRWPCA)

Title: Pure Water Monterey Groundwater Recharge Project – Engineering Report
Year: 2015 - Present

Trussell Technologies partnered with Nellor Environmental Associates and Todd Groundwater to prepare an Engineering Report for this Project on behalf of MRWPCA and the Monterey Peninsula Water Management District. The submitted Engineering Report details treating the Regional Treatment Plant secondary effluent through the proposed Advanced Water Treatment Facility (AWTF) using ozone, microfiltration, reserve osmosis, and ultraviolet light/advanced oxidation processes. This highly purified product water will be re-mineralized and conveyed to a well field for injection into the Seaside Basin aquifer to augment the region's potable water supply. In addition to the Engineering Report, Trussell Technologies has also assisted MRWPCA in several other projects related to the implementation of a groundwater recharge project, such sampling the additional alternative wastewater sources, conducting bench- and pilot-scale testing of the advanced treatment processes, brine disposal planning, assisting with technical aspects of the CEQA review, and assisting with design services for the AWTF. Trussell Technologies continues to provide permitting support for this groundwater recharge project.

Role: Project Manager

San Elijo Joint Powers Authorities

Title: Side Stream RO Design and Various Projects
Year: 2008 – 2015

Trussell Technologies worked with SEJPA to develop an operations plan for the whole facility to improve treatment, eliminate guesswork, and minimize the operating cost of the SEWRF. Our staff also provided the SEJPA with the conceptual design for their 0.5 MGD MF/RO demineralization facility, which has been operating at a constant flow for over 4 years. Trussell Technologies has provided ongoing technical support and operations and maintenance recommendations for the MF and RO systems. Trussell Tech's recommendations have ensured stable operations and reliable performance of the membrane systems at all times, including during challenging water quality events. The biological part of the operations plan resulted in more consistent and effective biological treatment that produces non-nitrified secondary effluent typically below 2 NTU.

Role: *Project Manager*

Fallbrook Public Utility District

Title: Water Reclamation Plant 1 Capital Improvement Plan
Year: 2007 - 2014

Fallbrook Public Utilities District (FPUD) currently owns and operates the Fallbrook Water Reclamation Plant 1 (WRP 1), which can treat up to 2.7 mgd. Trussell Technologies and Pirnie/ARCADIS conducted planning level study to assess the existing plant's performance, determine required plant improvements, and provide rough estimates of probable construction costs for the upgrades necessary to insure reliable facilities for the next 20-30 years. Pirnie/ARCADIS and Trussell Technologies worked diligently with FPUD staff to determine the best approach for the WRP 1 Improvement Project; one that will not only address the current issues, but provide a robust process design that maximizes FPUD's capital investment and provides the most operational flexibility. In addition, Trussell Technologies performed a chlorine contact basin tracer study to assess the current chlorine disinfection capacity and performed the filter media design for their new granular media filters.

Role: *Project Manager*

Brett W. Faulkner, P.E.

EDUCATION

M.S., Environmental Engineering, *San Diego State University*

B.S., Civil Engineering, *University of Colorado*

REGISTRATION

Civil Engineer, State of California—No. 87912

CERTIFICATION

Grade III Wastewater Treatment Plant Operator—Certificate Number 41525

SUMMARY

Brett Faulkner has over ten years of experience working as an environmental engineer in California. Mr. Faulkner has been the lead project engineer for dozens of wastewater, recycled water, and potable reuse projects in California. Mr. Faulkner's expertise is in water and wastewater treatment processes with an emphasis on process design and optimization. Mr. Faulkner also operated the City of San Diego's Pure Water Demonstration Facility (PWDF) as a certified Grade 3 wastewater operator in the State of California for over 2 years. The PWDF has a production capacity of 1 MGD and includes ozone, biologically activated carbon filtration, membrane filtration, reverse osmosis, and UV advanced oxidation. Mr. Faulkner is skilled in GPS-X, a dynamic wastewater simulation modeling software, and has utilized biological modeling to assist in the evaluation, optimization, and/or sizing of biological treatment processes at more than 10 facilities ranging from 3 to 30 MGD. Mr. Faulkner currently provides routine operational support and/or as-needed engineering services to 5 wastewater agencies.

PROJECT EXPERIENCE *(Select Projects)*

City of Santa Barbara

Title: Engineering Services for Membrane Filtration Facility

Year: 2015 – Present

In the winter of 2015, the City of Santa Barbara commisioned a 3-mgd tertiary facility to produce recycled water using membrane filtration (MF). After experiencing issues with MF production, the City retained the services of Trussell Tech to help ensure that recycled water requirements can be reliably achieved. Trussell Tech has been working to analyze and track wastewater process parameters at the El Estero Wastewater Treatment Plant and has been engaged in process operations in order to best manage the feedwater quality supplying the MF system. Trussell Tech has also been involved in the optimization of MF system cleaning procedures and has led discussions between the City and the MF system supplier to implement modifications and improvements to the MF system. Trussell Tech continues to be involved in routine operational support for the facility where process optimization and implemented modifications have led to the reliable achievement of MF production requirements.

Role: *Project Engineer*

San Elijo Joint Powers Authorities

Title: Process Optimization Plan and As Needed Assistance

Year: 2008 – 2015

San Elijo Joint Powers Authority (SEJPA) owns and operates the San Elijo Water Reclamation Facility (SEWRF) in Cardiff By the Sea, California and produces up to 3 MGD of recycled water. Trussell Technologies worked with SEJPA to develop an operations plan for the whole facility to improve treatment, eliminate guesswork, and minimize the operating cost of the SEWRF. Our staff also provided the SEJPA with the conceptual design for their 0.5 MGD MF/RO demineralization facility that has been operating since 2013. Trussell Technologies has also provided ongoing technical support and recommendations for the MF and RO operation and maintenance procedures. Our recommendations to MF and RO operations ensured that membrane processes operate stably and are able to rebound in performance quickly during any challenging water quality events. The biological part of the operations plan resulted in more consistent and effective biological treatment that produces non-nitrified secondary effluent typically below 3 NTU, and improvements to the

chemical dosing and feed logic that have reduced alum and polymer use by over 95%.
Role: *Project Engineer*

Padre Dam Municipal Water District

Title: Indirect Potable Reuse Full Advanced Treatment Demonstration Project
Year: August 2013 – Present

This innovative groundwater recharge project is the first to seek Division of Drinking Water (DDW) approval for the minimum use of the groundwater aquifer for treatment and storage. To justify shorter storage times, the project team demonstrated increased pathogen removal through the advanced treatment process. Our team worked with the District to develop a novel, cost-effective strategy which includes seeking DDW approval for free chlorine disinfection of the recycled water used as feedwater. Trussell Technologies coordinated with both an Independent Advisory Panel and DDW to gain approval for a demonstration testing plan and designed and provided procurement services for an advanced water treatment demonstration facility that began its 12-month testing period in March 2015.

Mr. Faulkner has assisted with demonstration testing that included pathogen and chemical challenge tests, as well as the evaluation of brine management options. Mr. Faulkner trained the Padre Dam operators on how to operate and troubleshoot each unit process and is on call to provide support to the ops staff currently running the facility. Mr. Faulkner also manages and oversees process performance data and optimization of the demonstration facility.
Role: *Project Engineer/Operations Support*

City of San Diego Water Planning Department

Implementation of Extended Testing of Advanced Water Purification Facility (AWPF)
Year: 2013 – 2015

Mr. Faulkner operated and conducted testing of additional advanced treatment barriers specific to potable reuse using the City's 1 MGD Pure Water Demonstration Facility. The project team built upon a National Water Research Institute (NWRI) Panel's recommendations for treatment and monitoring needs associated with potable reuse. Ozone and biologically activated carbon (BAC), applied upstream of MF/UF and RO, was investigated as a means of providing additional disinfection credits for virus and protozoa, removing contaminants of emerging concern (CECs), and potentially reducing organic fouling of the membrane systems. The use of additional barriers will further minimize potential health concerns associated with the potable water reuse. The team focused on optimizing treatment processes for pathogen and contaminant removal and gathering data from various online water quality monitoring technologies. Mr. Faulkner was the lead operator for the extended testing project, performed the majority of maintenance and repairs for the facility, and was available on-call to address and troubleshoot any operational issues through the duration of the project.
Role: *Project Engineer/Operator*

Santa Fe Irrigation District

Title: Potable Reuse Feasibility Study
Year: 2015 – Present

The Santa Fe Irrigation District (SFID), San Dieguito Water District (SDWD) and the San Elijo Joint Powers Authority (SEJPA) are seeking greater water supply independence through potable reuse. Trussell Tech has been working on assessing the feasibility of a multi-agency, regional potable reuse project via surface water augmentation at the San Dieguito Reservoir. As part of the project, the Trussell team developed a resource document on the current status of the developing potable reuse regulations in California and lay the groundwork for understanding potential processes to be included in a future advanced water treatment facility (AWTF). Key elements of this feasibility study include evaluations of: (1) the additional treatment requirements at SEJPA's existing water recycling facility, (2) the availability of additional regional wastewater flows to feed the new AWTF, (3) the upgrades needed to SDWD's pipeline between SEJPA's recycling facility and SFID's San Dieguito Reservoir, and (4) potential upgrades to SFID's R.E. Badger Filtration Plant. The feasibility study will also include an alternatives analysis of the various options, including cost estimates for both near-term (5 to 10 years) and long-term (15 to 20 years) project alternatives.
Role: *Project Engineer*

John D. Kenny, P.E.

EDUCATION

M.S., Civil & Environmental Engineering, *University of California at Berkeley*

B.S., Civil, Environmental, & Architectural Engineering, *University of Kansas*

REGISTRATION

Civil Engineer, State of California, No. 82975

SUMMARY

John Kenny is a process and water quality expert with Trussell Technologies, Inc. He is the lead process engineer for Pure Water Monterey, a 5-mgd groundwater replenishment reuse project utilizing ozonation upstream of membrane filtration and reverse osmosis. Mr. Kenny leverages operational and engineering experience with applied problem solving and fundamentals to optimize treatment plants, organize for sustained operation, and increase the level of comfort and confidence of operating staff and engineers.

PROJECT EXPERIENCE *(Select Projects)*

Monterey One Water

Pure Water Monterey

2013 – Present

To meet water supply needs in the region, Monterey One Water consulted Trussell Technologies to develop the Pure Water Monterey project, a Groundwater Replenishment Reuse Project. Our project team has been providing technical and operational guidance from the conception phase through production. Our team has conducted preliminary bench-scale tests of new source waters, pilot-tested the treatment train, evaluated regulatory compiance, assisted with obtaining permits and with public outreach, designed the Demonstration Facility, provided bid-phase support and engineering services during construction, trained the operators, and developed the Engineering Report and the Operations Optimization Plan, including the Membrane Filtration Integrity Verification Protocol. Our project team has provided opertional support for the Demonstration Facility for five years, including developing of an RO CIP SOP, evaluating RO pre-treatment chemicals, training operators, evaluating Key Performance Indicators, and providing update reports. Our team has also optimized the MF backwash and cleaning strategies and chloramine control strategies. Mr. Kenny continues to provide technical guidance as the project enters operations and considers expansion.
Role: *Process and Water Quality Lead*

Alameda County Water District

Joint ACWD, SFPUC, and USD Purified Water Feasibility Evaluation

2019 – Present

As part of the consulting services to Alameda County Water District for their Purified Water Feasibility Evaluation, Trussell Tech will conduct a relability assessment of the Newark Desalination Facility, which includes reverse osmosis to reduce the total dissolved solids concentration of brackish groundwater.
Role: *Desalter Assessment Task Lead*

Carmel Area Wastewater District

Reclamation Plant Membrane Filtration and Reverse Osmosis Capacity Improvements and Operational Support

2017 - Present

The Carmel Area Wastewater District in conjunction with the Pebble Beach Community Sanitation District implemented the Salinity Management Project to control salt levels in the recycled water that they provide to high-end golf courses. With decreasing wastewater flows and expensive potable supplies, Trussell Tech was consulted to maximize recovery and support operation of their microfiltration and reverse osmosis processes. Trussell Tech assessed the water quality, provided recommendations for pre-treatment, optimized the MF cleaning regime, assisted with the procurement of alternative membranes, and developed an implementation plan for increasing RO recovery. Trussell Tech has since held monthly calls with the District providing opertional guidance and feedback based on review of water quality data and key performance indicators. Topics have included secondary performance, pre-treatment, MF cleaning regimes, RO pre-treatment, recovery, MF and RO replacement, autopsies, and control strategies. Coupled with these monthly calls, Trussell Tech has submitted quarterly reports summarizing the operational conditions, equipement perofrmance and action items.
Role: *Project Engineer*

Soquel Creek Water District / Black & Veatch
Pure Water Soquel
2020 - Present
Soquel Creek Water District is implementing a groundwater replenishment reuse project to combat sea water intrusion. Trussell Tech and Black & Veatch were selected as the design-builder for the project. The advanced facilities will receive wastewater from the Santa Cruz Wastewater Treatment Facility. The advanced facilities will include chloramination, MF, RO, AOP and post-treatment. Trussell Tech will provide process design support, the validation and acceptance test plan, the operations optimization plan, training, and startup commissioning and support.
Role: *Process and Water Quality Lead*

Fallbrook Public Utilities District
Santa Margarita River Conjunctive Use Project Facilities Design
2014 – Present
The Fallbrook Public Utility District is integrating a new potable water supply into their portfolio through the Santa Margarita River Conjunctive Use Project, where FPUD will receive infiltrated Santa Margarita River water from Marine Corps Base Camp Pendleton. Trussell Technologies was hired to assist with designing the SMRCUP facilities, which include iron and manganese treatment, reverse osmosis, stabilization and disinfection. The effort has included developing a raw water quality characterization of the source water, defining treatment goals, and developing alternative treatment options, developing the design through the 30-% to 100%-level for use in a bid package, bid-phase support services, engineering services during construction, and working with regulators to ensure compliance. Most recently, Mr. Kenny is helping FPUD evaluating the use of Granular Activated Carbon to treat the RO bypass. When construction nears completion, Trussell Tech will train the operators and assist with startup and commissioning of the facilities. Trussell Tech will also write the Operations Plan for the facility.
Role: *Process and Water Quality Lead*

Cherokee Metropolitan District / Forsgren
Water Reclamation Facility Total Dissolved Solids Compliance Project
2018 - 2019
The Cherokee Metropolitan District is constructing a total dissolved solids sidestream treatment facility at their water reclamation facility to meet limitations in their discharge permit. The effluent from the WRF is discharged to rapid infiltration basins which recharge the aquifer that CMD uses for water supply. Forsgren and Cherokee Metropolitan District consulted Trussell Tech to provide technical guidance and review for the preliminary design of the facilities, which included granular media filtration, membrane filtration and reverse osmosis. Trussell Tech leveraged its experience in potable reuse gained in California to help the largest project of its kind in Colorado. Trussell Tech reviewed piloting data and made conceptual design recommendations to improve process performance.
Role: *Project Lead*

Ovivo
iSEP Membrane Demonstration Testing for California Recycled Water Applications
2012
Ovivo consulted Trussell Tech to evaluate their iSEP membrane to see if it met California Division of Drinking Water requirements for an alternative filtration technology. Trussell Technologies conducted pilot testing at the Santa Lucia Preserve Community Services District wastewater treatment plant. The testing showed that the membrane could be accepted as alternative filtration technology and it was subsequently granted approval by DDW. Mr. Kenny reviewed the membrane performance and operator logs and discussed with the operators in developing the report for DDW approval.
Role: *Project Engineer*

WateReuse Foundation
Reclaimed Water Desalination Technologies: A Full-Scale Performance and Cost Comparison between EDR and MF/RO
2012
Many water reuse facilities are required to reduce the product water salinity and RO membranes have been the predominate technology used to remove salt removal in recycled water. However, because of its lower capital cost, Electrodialysis Reversal (EDR) is often proposed as an alternative to RO, but rarely actually selected (only used for reuse by two plants in US), because the actual life-cycle costs for a reuse plant are unknown. Trussell Technologies, Inc. compared the actual capital and O&M costs of EDR and RO membranes facilities used to remove salt from recycled water. The final report from this project serves as practical guide to water reuse utilities to select of the most appropriate and economical desalting technology based on the specifics of their plant.
Role: Project Engineer

Aleksey (Aleks) N. Pisarenko, Ph.D.

EDUCATION

Doctorate in Chemistry, *Miami University*, Oxford, OH
B.S., Chemistry, *York College of Pennsylvania*

CERTIFICATION

State of California Grade V Wastewater Operator License – Certificate Number 41526

SUMMARY

Dr. Aleks Pisarenko brings over 9 years of experience in the design, operation, and testing of advanced treatment technologies. Dr. Pisarenko is a certified Grade 5 Wastewater Operator, with over 5 years of experience operating and maintaining the City of San Diego's 1 MGD Pure Water Demonstration Facility (PWDF). Through the past and on-going projects, Dr. Pisarenko also developed training materials for City operators and led several optimization studies of for the MF and RO systems to enhance performance and reduce energy consumption. This included evaluating alternative surrogates for enhanced pathogen removal credit for RO; benchmarking UV/HOCl AOP and other processes for removal of harmful organic contaminants; using on-line monitoring of key performance indicators for detection of process failures; developing control strategies to ensure reliable potable reuse; and conducting pre-qualification testing of RO antiscalant products and evaluating an innovative control of membrane fouling for chemical and energy savings.

PROJECT EXPERIENCE *(Select Projects)*

City of San Diego

Title: Pure Water Program
Date: 2015 – Present

Pure Water San Diego is the City's 20-year program to provide a safe, secure and sustainable local drinking water supply for San Diego. This project builds upon 5 years of operation and testing of the 1 MGD Pure Water Demonstration Facility (PWDF). The facility includes a full-advanced treatment train (MF, RO, UV/AOP) with ozone and biologically active carbon (BAC) pre-treatment. Dr. Pisarenko managed the operation of the PWDF from 2013 until 2017, when the City staff took over operations and maintenance duties. During that time, he helped transition operations by leading the development and implementation of training modules for the City operators including process controls, treatment goals, data management, maintenance, and safety. Dr. Pisarenko continues to provide technical support for operation and maintenance of the PWDF, train new operators, and support the City with research and optimization studies. Dr. Pisarenko's experience both operating and conducting testing at the PWDF was a vital part of a robust full-scale design and sound regulatory strategy to demonstrate reliability of the selected process train. Dr. Pisarenko also led pre-qualification testing for MF, RO, and UV/AOP equipment for the pre-selection of this major process equipment.
Role: *Project Engineer and PWDF Manager*

City of San Diego / Kleinfelder

Title: Pure Water Demonstration Facility Design Pilot Studies, Antiscalant Pre-Qualification, and Innovative Control of Biofouling
Date: 2016 – 2019

These projects are comprised of a series of additional studies conducted at the City of San Diego's 1 MGD PWDF. Between 2016 and 2019, additional studies at the PWDF were conducted to test potential solutions to key design challenges such as: pre-qualification testing of antiscalant products; optimization of RO pre-treatment chemicals; investigation of RO oxidation protection methods; and optimization of chloramine use for more efficient control of membrane fouling. All of these studies, led by Dr. Pisarenko, have lowered operating costs and have helped produce a robust design of the future 30 MGD Advanced Water Purification Facility.
Role: *Project Engineer and PWDF Manager*

City of Santa Barbara

Title: Engineering Services for Membrane Filtration Facility
Date: 2015—Present

The City of Santa Barbara brought the Trussell team onboard to develop operations and maintenance plans for the 3 MGD tertiary membrane filtration facility at the El Estero WWTP.

As part of the project, our team developed an operations plan to help the City meet recycled water demand and established a cleaning regiment to ensure production is not impacted by membrane fouling events. Our team continues to offer operations support by monitoring changes in Key Performance Indicators (e.g., recovery, transmembrane pressure, and permeability) for the 3 parallel UF trains.
Role: *Project Engineer*

Confidential Client
Title: Technical Support for Large MF/RO/UV System
Date: 2015
This large confidential client has a sizeable facility including MF, RO, and UV disinfection. Significant fouling was observed on the RO membranes, resulting in more frequent cleaning frequency. Our project team focused on review of operational data, chemical usage, cleaning intervals, and membrane autopsy characterization to develop recommendations to improve control of fouling and scaling.
Role: *Project Engineer*

San Elijo Joint Powers Authority
Title: Technical Support of Operation & Maintenance of San Elijo Water Relamation Facility
Date: 2013 – Present
This project focused on supporting operation of the non-nitrified water reclamation facility, which includes a 0.5 MGD MF/RO demineralization facility. Dr. Pisarenko has led efforts to: identify and track Key Performance Indicators for the MF and RO Systems, assist operators in tracking performance, and develop a routine maintenance schedule. Trussell Tech continues to be involved in routine operational support for the facility.
Role: *Project Engineer*

Padre Dam Municipal Water District
Title: Indirect Potable Reuse Full Advanced Treatment Demonstration Project
Date: 2014 – 2016
Our team coordinated with both an independent advisory panel and DDW to gain approval for the demonstration testing plan which would gain additonal log reduction of pathogens in lieu of longer environmental storage times. The selected process train included free chlorine disinfection followed by full advanced treatment (MF, RO, and UV/AOP). Dr. Pisarenko provided support during construction of the demonstration facility and helped develop and implement a testing plan to prove the treatment effectiveness of the designed process train to DDW. Dr. Pisarenko also supported operations of advanced treatment processes to ensure consistent, reliable performance during testing.
Role: *Project Engineer*

WRRF / State of CA Department of Water Resources / San Diego County Water Authority
Title: WRRF 14-12: Demonstrating Redundancy and Monitoring to Achieve Reliable Potable Reuse
Date: 2014 – 2017
This project focuses on leveraging industry experience and results from recent Direct Potable Reuse projects to demonstrate that potable reuse can be implemented safely without the requirement of an environmental buffer. Additional treatment is in the form of ozone and biofiltration combined with the Full Advanced Treatment train, that is currently accepted for Indirect Potable Reuse in CA. On-line and laboratory monitoring of critical control points ensures process perfromance and treatment goals. The project was implemented at City of San Diego's 1 MGD Pure Water Demonstration Facility.
Role: *Project Engineer/AWP Facility Manager*

City of San Diego Public Utilities Department
Title: Implementation of Extended Testing of Advanced Water Purification Facility (AWPF) – CA State Proposition 50 Funded Project
Date: 2013 – 2015
Our project team worked to evaluate a multi-barrier approach against acute risks associated with pathogens and to evaluate treatment alternatives to an environmental buffer at the City of San Diego's 1 MGD Advanced Water Purification Facility (AWPF). Our team investigated wheter installing ozone-BAC upstream of MF/RO could provide additional disinfection credits for virus and protozoa, removing contaminants of emerging concern and reducing organic fouling of the downstream membrane systems. The use of additional barriers further minimize potential health concerns associated with the potable water reuse. The project team optimized and tested treatment processes during 8-month period of demonstration facility operation.
Role: *Project Engineer/AWP Facility Manager*

Eileen Y. Idica, Ph.D., P.E.

EDUCATION

- Ph.D. Civil & Environmental Engineering, *University of California, Los Angeles*
- M.S. Civil & Environmental Engineering, *University of California, Los Angeles*
- B.S. Civil & Environmental Engineering, *University of California*, *Berkeley*

REGISTRATION

Civil Engineer, State of California – No. 79662

SUMMARY

Dr. Eileen Idica is a principal engineer at Trussell Technologies with over ten years of experience in the California water and wastewater industry. She has extensive experience in the process design and procurement of membrane facilities for treatment of wastewater and drinking water (including surface water, groundwater, and seawater) in California. This includes experience with microfiltration, ultrafiltration, and reverse osmosis products and original equipment manufacturers successful in municipal applications for recycled water, potable reuse, and drinking water. Eileen has supported utilities in prequalification and preselection of these products and/or suppliers, development of design specifications, and technical review of design, warranty, and testing submittals for design-bid-build, design-build, and progressive design build projects. Eileen has the ability to understand upstream water treatment processes in terms of water quality and performance, as well as downstream requirements for State Water Board regulations and ease of operations and maintenance to support utilities in balancing these with capital costs to implement optimal membrane systems. Eileen also emphasizes the importance of quality assurance and control in projects to ensure efficient use of a project's limited funds.

PROJECT EXPERIENCE

Padre Dam Municipal Water District and the East County Advanced Water Purification Joint Powers Authority

Title: East County Advanced Water Purification Project
Year: 2013-present

The East County Advanced Water Purification Project is a potable reuse project in East San Diego County and is a collaborative effort among Padre Dam Municipal Water District, San Diego County Sanitation District, the City of El Cajon, and Helix Water District. The East County AWP Project began with efforts by Padre Dam to develop the project concept, including the construction of a 100,000 gpd demonstration facility at the Ray Stoyer Water Reclamation Facility. Eileen developed the process mechanical design of the demonstration facility for the free chlorine pipeline contactor, membrane filtration system, reverse osmosis system, UV/AOP unit, various water quality online instrumentation, and chemical feed systems through final specifications and engineering drawings. The facility was procured through a design-bid-build method, with Trussell support through construction, and the demonstration facility began operating in March 2015. Various testing investigations, led by Trussell, have taken place at the demonstration facility, including a year of intensive testing for potable reuse feasibility – including MS2 challenge testing to demonstrate free chlorine effectiveness in a new application, reverse osmosis and brine minimization testing – which has led to an unprecedented 95% recovery demonstrated through the closed circuit RO configuration, and preformed chloramines – which required modification of the demonstration facility chemical feed systems and control logic in order to meet non-detect levels for two trihalomethanes. Eileen has supported Padre Dam and the JPA in utilizing these testing results to define the full-scale 12.5 mgd production capacity treatment design through an initial basis of design report, preselection of membrane filtration modules, among other activities, and will continue to support the JPA through final design to ensure permitability of the project from the Division of Drinking Water and Regional Board.

Role: *Project Engineer and Deputy Project Manager*

City of San Diego

Pure Water San Diego Program
Year: 2013 - Present

Since 2008, Trussell has had a long history supporing the City of San Diego with their water research program dedicated to evaluating potential local water supplies, determining optimal water quality criteria, and research to develop accurate treatment cost estimates. More recently, since 2013, Trussell has supported the

development of the North City facilities (34 mgd production capacity) as part of Phase 1 of the Pure Water Program. Eileen contributed to the following select tasks and achievements that Trussell has performed for the City under a variety of contracts and projects, include one direct contract (no RFP) with the City, approved in 2017, for a total $4.86M over five years:

- Procured and oversaw installation of 1.5-mgd capacity ozone system (generation and contactor) and biologically active carbon filtraiton system into the Pure Water Demonstration Facility in 2013
- Operation of the Pure Water Demonstration Facility from 2013 to 2017, consisting of 1 mgd production capacity MF/UF-RO-UVAOP treatement train
- Led treatment process decisions for the 10% and 30% Basis of Design Report for the North City Pure Water Facility
- Led membrane filtration system prequalification process, including pilot testing for selection criteria
- Conducted high rate fitler effluent evlauation testing at the North City Water Reclamation Facility to achieve the highest filtration rate currently approved by DDW for recycled water (8.7 gpm/sf)
- Water Research Foundation Reuse 14-12 Project, funded by California State Proposition 84 to demonstrate treatment redudancy and monitoring to achieve reliable potable reuse in 2015 – Eileen managed this $3.1M research project that include a year of intenstive testing and data collection at the Pure Water Demonstration Facility
- USBR-funded study to demonstrate enhanced pathogen removal thorugh reverse osmosis in 2015

Role: *Project Engineer and Deputy Project Manager*

East Valley Water District / Balfour Beatty Infrastructure / Arcadis

Sterling Natural Resource Center
Year: 2018 - Present

The Sterling Natural Resource Center is an 8-mgd capacity recycled water facility that will produce potable reuse water for groundwater recharge once online in 2022. The facility includes headworks treatment and screening, secondary aeration basins, membrane bioreactor system, and UV disinfection. Trussell is part of the progressive design build team under Balfour Beatty Infrastructure for design and construction of the facility for the East Valley Water District. Trussell is leading the MBR and UV system process design and permitting considerations with regards to compliance with DDW and Regional Board requirements. Eileen is the lead project engineer handling the membrane filtration and UV system specifications, engineering services during construction (submittal review and response to requests for information), and startup activites related to permitting compliance (e.g., UV validation testing through spot-check bioassays).

Role: *Project Engineer*

Bureau of Engineering, Department of Public Works, City of Los Angeles

Title: Terminal Island Water Reclamation Plant (TIWRP) Advanced Water Purification Facility (AWPF) Ultimate Expansion Project
Year: 2013 - 2014

Trussell Technologies, Inc. aided the City of Los Angeles (City) in procuring final design and construction services for the Terminal Island Water Reclamation Plant (TIWRP) Advanced Water Purification Facility (AWPF) Ultimate Expansion Project. The existing TIWRP AWPF was constructed in 2002 as part of Phase 1 of this project, and included treatment of approximately 7.4 MGD of TIWRP tertiary effluent resulting in 5 MGD of product water. Treatment includes microfiltration (MF), followed by reverse osmosis (RO), disinfection via chloramination, and post-stabilization. The expansion to Ultimate capacity will include additional MF and RO trains, as well as an advanced oxidation process (AOP) system to further enhance the quality of the product water. Trussell Technologies was retained by the City to help in conceptual design and procurement of the RO and AOP systems through a design-build delivery method. With regards to the RO portion of the work, Trussell Technologies built upon the existing system's design and performance to develop technical specifications for the procurement of the additional trains. This ensures that the new RO trains will be compatible with the existing system and allow for optimal operation of the entire, expanded facility. Trussell Technologies also took into account the Proposed Regulations for Groundwater Replenishment with Recycled Water from the California Department of Public Health when updating the additional RO train design to confirm compliance once these regulations take effect.

Role: *Project Engineer*