



*Dedicated to
Satisfying our Community's
Water Needs*

**AGENDA
MESA WATER DISTRICT
BOARD OF DIRECTORS
Thursday, October 10, 2019
1965 Placentia Avenue, Costa Mesa, CA 92627
6:00 p.m. Regular Board Meeting**

CALL TO ORDER

PLEDGE OF ALLEGIANCE

2019 ROSE AWARD FROM ORANGE COUNTY TAXPAYERS ASSOCIATION

PUBLIC COMMENTS

Items Not on the Agenda: Members of the public are invited to address the Board regarding items which are not on the agenda. Each speaker is limited to three minutes. The Board will set aside 30 minutes for public comments.

Items on the Agenda: Members of the public may comment on agenda items before action is taken, or after the Board has discussed the item. Each speaker is limited to three minutes. The Board will set aside 60 minutes for public comments.

ITEMS TO BE ADDED, REMOVED, OR REORDERED ON THE AGENDA

At the discretion of the Board, all items appearing on this agenda, whether or not expressly listed as an Action Item, may be deliberated and may be subject to action by the Board.

CONSENT CALENDAR ITEMS:

Approve all matters under the Consent Calendar by one motion unless a Board member, staff, or a member of the public requests a separate action.

1. Approve minutes of regular Board meeting of September 12, 2019.
2. Approve minutes of special Board meeting of September 17, 2019.
3. Approve minutes of special Board meeting of September 23, 2019.
4. Approve minutes of special Board meeting of September 23, 2019.
5. Approve attendance considerations (additions, changes, deletions).
6. Board Schedule:
 - Conferences, Seminars, and Meetings
 - Board Calendar
 - Upcoming Community Outreach Events
7. Award a contract to Carollo Engineers, Inc. in the amount of \$140,000 per year for five years for an amount not to exceed \$700,000 with 2-one year renewal options to provide Geographic Information System and Hydraulic Model Hosting and Maintenance Services.
8. Award a contract to T2 Tech Group, LLC in the amount of \$480,000 per year for five years with 2 one-year renewal options to provide Information Technology Support Services.

ACTION ITEMS:

9. REPLACEMENT OF ASSETS INCLUDING PIPELINE AND WELL REHABILITATION:



Recommendation: Adopt Resolution No. 1525 Regarding the Replacement of Assets including Pipeline and Well Rehabilitation Superseding Resolution No. 1442.

PRESENTATION AND DISCUSSION ITEMS:

10. OUTREACH TOPIC – WATER QUALITY:

Recommendation: Receive the presentation

11. MESA WATER DISTRICT CUSTOMER SURVEY:

Recommendation: This item is provided for discussion.

REPORTS:

12. REPORT OF THE GENERAL MANAGER:

- September Key Indicators Report
- Other (no enclosure)

13. DIRECTORS' REPORTS AND COMMENTS

INFORMATION ITEMS:

14. DIRECTORS' REPORTS (AB 1234) PER CA GOVERNMENT CODE SECTION 53232.3 (D)

15. OTHER (NO ENCLOSURE)

CLOSED SESSIONS:

16. CONFERENCE WITH LEGAL COUNSEL – EXISTING LITIGATION:

Pursuant to California Government Code Sections 54956.9 (d)(1) and 54954.5 (c)

Case: *Mesa Water District v. KDC, INC., dba KDC SYSTEMS, INC., dba DYNALECTRIC*

Orange County Superior Court Case No. 30-2016-00832860-CU-BC-CJC

17. CONFERENCE WITH SPECIAL LEGAL COUNSEL – EXISTING LITIGATION

Pursuant to California Government Code Section 54956.9 (d)(1)

Case: *Irvine Ranch Water District v. Orange County Water District and related cross-actions, Los Angeles County Superior Court Case Nos. BS168278 and BS 175192*



In compliance with California law and the Americans with Disabilities Act, if you need disability-related modifications or accommodations, including auxiliary aids or services in order to participate in the meeting, or if you need the agenda provided in an alternative format, please contact the District Secretary at (949) 631-1206. Notification 48 hours prior to the meeting will enable Mesa Water District (Mesa Water) to make reasonable arrangements to accommodate your requests.

Members of the public desiring to make verbal comments utilizing a translator to present their comments into English shall be provided reasonable time accommodations that are consistent with California law.

Agenda materials that are public records, which have been distributed to a majority of the Mesa Water Board of Directors (Board), will be available for public inspection at the District Boardroom, 1965 Placentia Avenue, Costa Mesa, CA and on Mesa Water's website at www.MesaWater.org. If materials are distributed to the Board less than 72 hours prior or during the meeting, the materials will be available at the time of the meeting.

ADJOURN TO A REGULAR BOARD MEETING SCHEDULED FOR THURSDAY, NOVEMBER 14, 2019 AT 6:00 P.M.



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**MINUTES OF THE BOARD OF DIRECTORS
MESA WATER DISTRICT
Thursday, September 12, 2019
1965 Placentia Avenue, Costa Mesa, CA 92627
6:00 p.m. Regular Board Meeting**

CALL TO ORDER

The meeting of the Board of Directors was called to order on September 12, 2019, at 6:00 p.m. by President Dewane at the District Office Boardroom, located at 1965 Placentia Avenue, Costa Mesa, California.

PLEDGE OF ALLEGIANCE

Director Atkinson led the Pledge of Allegiance.

Directors Present

Shawn Dewane, President
Marice H. DePasquale, Vice President
Jim Atkinson, Director
Fred R. Bockmiller, P.E., Director
James R. Fisler, Director

Directors Absent

None

Staff Present

Paul E. Shoenberger, P.E., General Manager
Phil Lauri, P.E., Assistant General Manager
Denise Garcia, Administrative Services Manager/
District Secretary
Marwan Khalifa, CPA, MBA, Chief Financial Officer/
District Treasurer
Jeff Hoskinson, Partner, Atkinson, Andelson, Loya, Ruud &
Romo

Others Present

John Domenici, Field Representative, Southland Sod Farms
Michael R. Marcus, General Manager, Orange County Water
District (OCWD)

SOUTHLAND SOD PRESENTATION

General Manager Shoenberger introduced Southland Sod Farms Field Representative John Domenici who provided a brief overview of Southland Sod Farms products and the benefits of its proprietary grass varieties, which have been tested for adaptability to Southern California climate and soils.

Mr. Domenici responded to questions from the Board and the Board thanked him for the presentation.

RECESS

President Dewane declared a recess at 6:30 p.m.

The Board meeting reconvened at 6:33 p.m.

PUBLIC COMMENTS

President Dewane asked for public comments on items not on the agenda.

There were no comments and President Dewane proceeded with the meeting.

ITEMS TO BE ADDED, REMOVED, OR REORDERED ON THE AGENDA

GM Shoenberger reported there were no items to be added, removed, or reordered on the agenda.

CONSENT CALENDAR ITEMS:

Approve all matters under the Consent Calendar by one motion unless a Board member, staff, or a member of the public requests a separate action.

1. Approve minutes of regular Board meeting of August 8, 2019.
2. Approve minutes of special Board meeting of August 20, 2019.
3. Approve minutes of special Board meeting of August 26, 2019.
4. Approve minutes of special Board meeting of August 26, 2019.
5. Approve attendance considerations (additions, changes, deletions).
6. Board Schedule:
 - Conferences, Seminars, and Meetings
 - Board Calendar
 - Upcoming Community Outreach Events
7. Adopt the 2019 Orange County Regional Water and Wastewater Hazard Mitigation Plan and direct staff to prepare a letter to Municipal Water District of Orange County certifying adoption.
8. Award a contract with Badger Meter, Inc. using the Special Pricing Consideration contract option; and renegotiate contract pricing at the end of the contract term and accept the lower of the Pricing Index increase or renegotiated Fixed Escalation.
9. Adopt Badger Meter Cellular Endpoint technology as the standard for non-high use customers at the customer's sole expense; and allow customers to spread the capital cost repayment over six billing cycles (1 year).
10. Approve a sponsorship to The HERD Foundation in the amount of \$5,000 to assist in the continuation of regenerative agriculture in Orange County.
11. Award a five-year contract to True North Research, Inc. for \$34,875 per year to conduct the Mesa Water District Customer Survey.

President Dewane asked for public comments. There were no comments.

MOTION

Motion by Vice President DePasquale, second by Director Fisler, to approve Items 1 – 9 and 11 of the Consent Calendar. Motion passed 5-0.

MOTION

Motion by Vice President DePasquale, second by Director Fisler, to approve Item 10 of the Consent Calendar. Motion passed 4-1, with Director Atkinson voting no.

ACTION ITEMS:

None.

PRESENTATION AND DISCUSSION ITEMS:

12. ORANGE COUNTY WATER DISTRICT BRIEFING:

GM Shoenberger introduced OCWD General Manager Mike Markus who proceeded with a presentation that highlighted the following:

- Groundwater Basin Conditions
- Ground Water Replenishment System (GWRS) Final Expansion
- Perfluorooctanoic Acid (PFOA) Financial Impacts
- FY19-20 Imported Water Deliveries

Mr. Marcus responded to questions from the Board and they thanked him for the presentation.

REPORTS:

13. REPORT OF THE GENERAL MANAGER:

- August Key Indicators Report
- Other (no enclosure)

14. DIRECTORS' REPORTS AND COMMENTS

INFORMATION ITEMS:

15. DIRECTORS' REPORTS (AB 1234) PER CA GOVERNMENT CODE SECTION 53232.3 (D)

16. OTHER (NO ENCLOSURE)

CLOSED SESSIONS:

President Dewane declared the Board was going into Closed Session at 8:00 p.m.

17. CONFERENCE WITH REAL PROPERTY NEGOTIATOR:

Pursuant to Government Code Section 54956.8

Property: 1310 South Coast Drive, Costa Mesa (APN: 140-041-49)

District Negotiator: General Manager

Negotiating Parties: AAA Automobile Club of Southern California

Under Negotiation: Price and/or terms concerning property rights

18. CONFERENCE WITH LEGAL COUNSEL – SIGNIFICANT EXPOSURE TO LITIGATION/ADJUDICATORY PROCEEDINGS:

Pursuant to California Government Code Sections 54956.9 (d)(2) and 54954.5 (c) - based on existing facts and circumstances, the Board is meeting with General Legal Counsel to review matters relating to legal proceedings presented to the California Fair Political Practices Commission involving Mesa Water District.

The Board returned to Open Session at 8:14 p.m.

District Secretary Garcia announced that the Board conducted two Closed Sessions:

The first Closed Session, Item 17, was conducted with the General Manager, Assistant General Manager, District Secretary, Chief Financial Officer and Legal Counsel pursuant to Government Code Section 54956.8. The Board received information and there was no further announcement.

The second Closed Session, Item 18, was conducted with the General Manager, Assistant General Manager, District Secretary, Chief Financial Officer, Legal Counsel and Special Legal Counsel participating via telephone pursuant to Government Code Sections 54956.9 (d)(2) and 54954.5 (c). The Board received information and there was no further announcement.

President Dewane adjourned the meeting at 8:15 p.m. to a Regular Board Meeting scheduled for Thursday, October 10, 2019 at 6:00 p.m.

Approved:

Shawn Dewane, President

Denise Garcia, District Secretary

Sharon D. Brimer, Recording Secretary



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**MINUTES OF THE BOARD OF DIRECTORS
MESA WATER DISTRICT
Tuesday, September 17, 2019
1965 Placentia Avenue, Costa Mesa, CA 92627
3:30 p.m. Special Board Meeting**

ENGINEERING AND OPERATIONS COMMITTEE MEETING

CALL TO ORDER

The meeting of the Board of Directors was called to order on September 17, 2019 at 3:30 p.m. by Chairman Bockmiller in the Upstairs Conference Room, located at 1965 Placentia Avenue, Costa Mesa, California.

PLEDGE OF ALLEGIANCE

Assistant General Manager Lauri led the Pledge of Allegiance.

Directors Present

Marice H. DePasquale, Vice President
Jim Atkinson, Director
Fred R. Bockmiller, P.E., Director, Chair
James R. Fisler, Director

Directors Absent

Shawn Dewane, President

Staff Present

Paul E. Shoenberger, General Manager
Phil Lauri, P.E., Assistant General Manager
Wendy Duncan, Records Management Specialist/
Acting District Secretary
Tracy Manning, Water Operations Manager
Karyn Igar, Senior Civil Engineer

Others Present

David Spencer, Asset Management Program Development
Lead, HDR, Inc.

PUBLIC COMMENTS

There were no comments on non-agendized topics.

CONSENT CALENDAR ITEMS:

Director Atkinson pulled Item 2 for discussion. There were no objections.

1. Developer Project Status Report
2. Mesa Water and Other Agency Projects Status Report
3. Water Quality Call Report
4. Committee Policy & Resolution Review
5. Water Operations Status Report

MOTION

Motion by Director Atkinson, second by Director Fisler, to approve Items 1, and 3 – 5 of the Consent Calendar. Motion passed 4-0-1, with President Dewane absent.

Assistant General Manager Lauri responded to questions from the Board regarding the Mesa Water and Other Agency Projects Status Report.

MOTION

Motion by Director Atkinson, second by Vice President DePasquale, to approve Item 2 of the Consent Calendar. Motion passed 4-0-1, with President Dewane absent.

ACTION ITEMS:

6. Geographic Information System Support Services

MOTION

Motion by Director Atkinson, second by Vice President DePasquale, to add to the next regular Board meeting Consent Calendar award of a contract to Carollo Engineers, Inc. in the amount of \$140,000 per year for five years for an amount not to exceed \$700,000 with 2-one year renewal options to provide Geographic Information System and Hydraulic Model Hosting and Maintenance Services. Motion passed 4-0-1, with President Dewane absent.

7. Replacement of Assets Including Pipeline and Well Rehabilitation

Assistant General Manger Lauri introduced Senior Civil Engineer Igar and HDR, Inc.'s Asset Management Program Development Lead David Spencer who proceeded with a presentation that highlighted the following:

- Strategic Replacement of Mesa Water's Assets
- 2013 – Replacement Based on Age
- 2014 – Resolution No. 1442 Replacement of Assets
- Successes
- Updated Cost Curve
- Challenges
- Proposed Updates
- Revised Policy Summary
- Thresholds for Actions
- Priority Metallic Pipeline Assessment Project
- Test When Exposed
- Revised Policy Output
- Staff Recommendation
- 100 Year Pipeline Replacement Evolution

Ms. Igar and Mr. Spencer responded to questions from the Board and they thanked them for the presentation.

MOTION

Motion by Director Atkinson, second by Vice President DePasquale, to add to the next regular Board meeting agenda adoption of Resolution No. XXXX Regarding the Replacement of Assets including Pipeline and Well Rehabilitation Superseding Resolution No. 1442. Motion passed 4-0-1, with President Dewane absent.

PRESENTATION AND DISCUSSION ITEMS:

None.

REPORTS:

8. Report of the General Manager
9. Directors' Reports and Comments

INFORMATION ITEMS:

10. Unregulated Contaminants Requiring Monitoring

The Board meeting was adjourned at 4:45 p.m.

Approved:

Shawn Dewane, President

Denise Garcia, District Secretary



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**MINUTES OF THE BOARD OF DIRECTORS
MESA WATER DISTRICT
Monday, September 23, 2019
1965 Placentia Avenue, Costa Mesa, CA 92627
3:30 p.m. Special Board Meeting**

LEGISLATIVE & PUBLIC AFFAIRS COMMITTEE MEETING

CALL TO ORDER

The meeting of the Board of Directors was called to order on September 23, 2019 at 3:30 p.m. by Chairwoman DePasquale in the Upstairs Conference Room, located at 1965 Placentia Avenue, Costa Mesa, California.

PLEDGE OF ALLEGIANCE

Department Assistant Erdman led the Pledge of Allegiance.

Directors Present

Shawn Dewane, President
Marice H. DePasquale, Vice President, Chair
Jim Atkinson, Director
Fred R. Bockmiller, P.E., Director
James R. Fisler, Director

Directors Absent

None

Staff Present

Paul E. Shoenberger, P.E., General Manager
Denise Garcia, Administrative Services Manager/
District Secretary
Stacy Taylor, External Affairs Manager
Celeste Carrillo, Public Affairs Coordinator
Brittany Erdman, Department Assistant

Others Present

John Lewis, President, Lewis Consulting Group

PUBLIC COMMENTS

There were no comments on non-agendized topics.

The agenda was reordered to take Item 3 before the Consent Calendar. There were no objections.

Item 3 – Orange County Update

General Manager Shoenberger introduced Lewis Consulting Group President John Lewis who proceeded with the Orange County Update.

Mr. Lewis responded to questions from the Board and they thanked him for the update.

CONSENT CALENDAR ITEMS:

1. State Advocacy Update

2. Outreach Update

Director Fisler requested an update on Item 1 prior to taking a vote.

Item 1 – State Advocacy Update

External Affairs Manager Taylor provided an update on State Advocacy.

Ms. Taylor responded to questions from the Board and they thanked her for the update.

MOTION

Motion by Director Fisler, second by Director Atkinson, to approve Items 1 and 2 of the Consent Calendar. Motion passed 5-0.

ACTION ITEMS:

None.

PRESENTATION AND DISCUSSION ITEMS:

3. Orange County Update

This item was taken earlier in the agenda.

4. Mesa Water Neighborhood Chats

Public Affairs Coordinator Carrillo provided a brief overview of the topic and answered questions from the Board.

No action was taken on this item.

REPORTS:

5. Report of the General Manager

6. Directors' Reports and Comments

INFORMATION ITEMS:

None.

The Board meeting was adjourned at 3:59 p.m.

Approved:

Shawn Dewane, President

Denise Garcia, District Secretary

Unapproved



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**MINUTES OF THE BOARD OF DIRECTORS
MESA WATER DISTRICT
Monday, September 23, 2019
1965 Placentia Avenue, Costa Mesa, CA 92627
3:30 p.m. Special Board Meeting**

FINANCE COMMITTEE MEETING

CALL TO ORDER

The meeting of the Board of Directors was called to order on September 23, 2019 at 4:00 p.m. by Chairman Fisler in the Upstairs Conference Room, located at 1965 Placentia Avenue, Costa Mesa, California.

Directors Present

Shawn Dewane, President
Marice H. DePasquale, Vice President
Jim Atkinson, Director
Fred R. Bockmiller, P.E., Director
James R. Fisler, Director, Chair

Directors Absent

None

Staff Present

Paul E. Shoenberger, P.E., General Manager
Denise Garcia, Administrative Services Manager/
District Secretary
Marwan Khalifa, CPA, MBA, Chief Financial Officer

Others Present

None

PUBLIC COMMENTS

There was no public present.

CONSENT CALENDAR ITEMS:

1. Accounts Paid Listing
2. Monthly Financial Reports
3. Major Staff Projects
4. Committee Policy & Resolution Review

MOTION

Motion by Vice President DePasquale, second by President Dewane, to approve Items 1 – 4 of the Consent Calendar. Motion passed 5-0.

ACTION ITEMS:

5. Information Technology Support Services

MOTION

Motion by Director Bockmiller, second by President Dewane, to add to the next Regular Board meeting Consent Calendar award of a contract to T2 Tech Group, LLC in the amount of \$480,000 per year for five years with 2 one-year renewal options to provide Information Technology Support Services. Motion passed 5-0.

PRESENTATION AND DISCUSSION ITEMS:

None.

REPORTS:

6. Report of the General Manager
7. Directors' Reports and Comments

INFORMATION ITEMS:

None.

The Board meeting was adjourned at 4:25 p.m.

Approved:

Shawn Dewane, President

Denise Garcia, District Secretary



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MEMORANDUM

TO: Board of Directors
FROM: Paul E. Shoenberger, P.E., General Manager
DATE: October 10, 2019
SUBJECT: Attendance at Conferences, Seminars, Meetings, and Events

RECOMMENDATION

In accordance with Ordinance No. 29, adopted February 14, 2019, authorize attendance at conferences, seminars, meetings, and events.

STRATEGIC PLAN

- Goal #1: Provide a safe, abundant, and reliable water supply.
- Goal #2: Practice perpetual infrastructure renewal and improvement.
- Goal #3: Be financially responsible and transparent.
- Goal #4: Increase public awareness about Mesa Water® and about water.
- Goal #5: Attract and retain skilled employees.
- Goal #6: Provide outstanding customer service.
- Goal #7: Actively participate in regional water issues.

PRIOR BOARD ACTION

At its July 11, 2019 meeting, the Board of Directors (Board) approved Fiscal Year 2020 attendance at Conferences, Seminars, Meetings, and Events.

DISCUSSION

During the discussion of this item, if any, the Board may choose to delete any item from the list and/or may choose to add additional conferences, seminars, meetings, or events for approval, subject to available budget or additional appropriation.

FINANCIAL IMPACT

None.

ATTACHMENTS

None.

2019 CONFERENCES, SEMINARS, AND MEETINGS:

October 21 - 24, 2019	
AWWA CA-NV Annual Fall Conference	
San Diego, CA	
December 2 - 6, 2019	
ACWA/JPIA Fall Conference	<i>Atkinson, Bockmiller, DePasquale</i>
San Diego, CA	
December 11 - 13, 2019	
Colorado River Water Users Association Conference	
Las Vegas, NV	
February 6 - 7, 2020	
CalDesal Annual Conference	
Santa Barbara, CA	
February 11 - 13, 2020	
ACWA Winter Quarterly Forum	
Sacramento, CA	
February 19 - 21, 2020	
Urban Water Institute Spring Conference	
Palm Springs, CA	
February 25 - 27, 2020	
ACWA Annual Washington D.C. Conference	
Washington, DC	
March 15 - 17, 2020	
WaterReuse California Annual Conference	
San Francisco, CA	
March 16 - 20, 2020	
Jt. CA-NV AWWA/AMTA Conference	
Phoenix, AZ	
April 6 - 9, 2020	
AWWA CA-NV Spring Conference	
Anaheim, CA	
April 15 - 16, 2020	
WaterNow Alliance 5th Annual Summit	
Philadelphia, PA	
May 4 - 8, 2020	
ACWA/JPIA Spring Conference	
Monterey, CA	
May 19 - 20, 2020	
CSDA Legislative Days	
Sacramento, CA	
June 14 - 17, 2020	
AWWA ACE20 Conference	
Orlando, FL	

October 2019

October 2019							November 2019						
Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa
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13	14	15	16	17	18	19	10	11	12	13	14	15	16
20	21	22	23	24	25	26	17	18	19	20	21	22	23
27	28	29	30	31			24	25	26	27	28	29	30

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Sep 29	30	Oct 1 7:30am ISDOC Executive Committee Meeting (Conference Room 101) 12:00pm R/S to 10/8 Executive Committee Meeting (Upstairs Conference Room) 5:45pm Costa Mesa City Council Meeting	2 Payday 7:00am Newport-Mesa State of the Schools (Estancia High School, 2323 Placentia Avenue, Costa Mesa) 8:30am Jr. MWDOC/MWD Workshop (MWDOC/OCWD Boardroom) 5:30pm OCWD Board Meeting (OCWD Boardroom)	3 8:00am CalMutuals Annual Meeting (Paso Robles) 8:30am	4 7:30am WACO Meeting (MWDOC/OCWD Boardroom)	5 2:00pm Centennial Farm 30th Anniversary Community Event (OC Fair)
6	7 8:30am MWDOC Planning & Operations Committee (Conference Room 101)	8 7:30am OCBC Infrastructure Committee Meeting (2 Park Plaza, Suite 125 Irvine, 92614; OCBC Conference Room) 12:00pm R/S from 10/1 Special Executive Committee Meeting (Upstairs Conference Room)	9 8:00am OCWD Water Issues Committee (OCWD Boardroom) 8:15am LAFCO Meeting (Hall of Administration 10 Civic Center Plaza Santa Ana, CA 92701) 8:30am MWDOC Admin & Finance Committee (Conference Room 101) 11:30am CM Chamber Event (3130 Bristol Street, Costa Mesa, CA)	10 4:00pm CM Chamber Board Meeting (TBD) 6:00pm Mesa Water Board Meeting (Boardroom)	11 Pay Period Ends 6:00pm Save Our Youth's Event (555 Anton Boulevard, Costa Mesa)	12 9:00am CMSD's 75th Anniversary (290 Paulatino Avenue)
13	14 5:00pm IRWD Board Meeting (15600 Sand Canyon Avenue, Irvine)	15 7:30am WACO Planning Committee (MWDOC Conference Room 101) 3:30pm Engineering and Operations Committee Meeting (Boardroom) 5:45pm Costa Mesa City Council Meeting (77 Fair Drive, Costa Mesa, California 92626)	16 Payday 8:30am MWDOC Board Meeting (MWDOC Boardroom) 5:30pm OCWD Board Meeting (OCWD Boardroom)	17 2019 ACWA Regulatory Summit (2200 Harvard Street, Sacramento) 8:30am MWDOC Executive Committee Meeting (Conference Room 102) 11:30am OC WaterReuse Meeting (HDR; 3230 Camino Real Suite 200 Irvine) 11:30am Orange County Conservation Corps' 25th Anniversary Event (1600 Disneyland Drive, Anaheim)	18 8:00am City Districts Liaison Committee Meeting (City of Costa Mesa City Hall, 77 Fair Drive, Costa Mesa)	19
20	21 8:30am MWDOC Public Affairs & Legislation Committee (Conference Room 101)	22	23 8:30am MWDOC/OCWD Jr. Planning (Conference Room 101)	24 11:30am ISDOC Quarterly Event (MWDOC/OCWD Boardroom) 5:30pm South Orange County Economic Coalition Legislative Meet and Greet (Memorial Care Saddleback Medical Center, 24451 Health Center Drive, Laguna Hills)	25 Pay Period Ends	26
27	28 3:30pm Finance/LPAC Meeting (Boardroom) 5:00pm IRWD Board Meeting (15600 Sand Canyon Avenue, Irvine)	29	30 Payday	31	Nov 1	2

November 2019

November 2019							December 2019						
Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa
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3	4	5	6	7	8	9	8	9	10	11	12	13	14
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17	18	19	20	21	22	23	22	23	24	25	26	27	28
24	25	26	27	28	29	30	29	30	31				

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Oct 27	28	29	30	31	Nov 1 7:30am WACO Meeting (MWDOC/OCWD Boardroom)	2
3	4 8:30am MWDOC Planning & Operations Committee (Conference Room 101)	5 7:30am ISDOC Executive Committee Meeting (Conference Room 101) 8:30am ACWA/PIA Executive Committee Meeting (FB) (Executive Conference Room) 12:00pm Executive Committee Meeting (Panian Conference Room) 5:45pm Costa Mesa City Council Meeting	6 8:30am Jt. MWDOC/MWD Workshop (MWDOC/OCWD Boardroom) 5:30pm OCWD Board Meeting (OCWD Boardroom)	7	8 Pay Period Ends 8:00am Board Workshop (Boardroom)	9
10	11 District Holiday 5:00pm IRWD Board Meeting (15600 Sand Canyon Avenue, Irvine)	12 7:30am OCBC Infrastructure Committee Meeting (2 Park Plaza, Suite 125 Irvine, 92614; OCBC Conference Room)	13 Payday 8:00am OCWD Water Issues Committee (OCWD Boardroom) 8:15am LAFCO Meeting (Hall of Administration 10 Civic Center Plaza Santa Ana, CA 92701) 8:30am MWDOC Admin & Finance Committee (Conference Room 101) 11:30am CM Chamber Event	14 4:00pm CM Chamber Board Meeting (TBD) 6:00pm Mesa Water Board Meeting (Boardroom)	15	16
17	18 8:30am MWDOC Public Affairs & Legislation Committee (Conference Room 101)	19 7:30am WACO Planning Committee (MWDOC Conference Room 101) 3:30pm Engineering and Operations Committee Meeting (Boardroom) 5:45pm Costa Mesa City Council Meeting (77 Fair Drive, Costa Mesa, California 92626)	20 8:30am MWDOC Board Meeting (MWDOC Boardroom) 5:30pm OCWD Board Meeting (OCWD Boardroom)	21 8:30am MWDOC Executive Committee Meeting (Conference Room 102)	22 District Holiday Pay Period Ends	23
24	25 3:30pm Finance/LPAC Meeting (Boardroom) 5:00pm IRWD Board Meeting (15600 Sand Canyon Avenue, Irvine)	26	27 Payday 8:30am MWDOC/OCWD Jt. Planning (MWDOC/OCWD Boardroom)	28 District Holiday	29	30

December 2019

December 2019							January 2020						
Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa
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8	9	10	11	12	13	14	12	13	14	15	16	17	18
15	16	17	18	19	20	21	19	20	21	22	23	24	25
22	23	24	25	26	27	28	26	27	28	29	30	31	
29	30	31											

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Dec 1	2	3	4	5	6	7
	<p>8:30am MWDOC Planning & Operations Committee (Conference Room 101)</p> <p>10:15am ACWA/JPIA Executive Committee Meeting (FB) (Grand Hyatt, San Diego)</p> <p>1:30pm ACWA/JPIA Board of Directors Meeting (FB) (Grand Hyatt, San Diego)</p> <p>4:00pm ACWA/JPIA Town Hall Meeting (FB) (Grand Hyatt, San Diego)</p>	<p>7:30am ISDOC Executive Committee Meeting (Conference Room 101)</p> <p>10:00am ACWA Groundwater Committee Meeting - JA (ACWA Fall)</p> <p>12:00pm R/S to 12/10 Executive</p> <p>1:00pm ACWA Energy Committee</p> <p>3:00pm ACWA Water Quality</p> <p>5:45pm Costa Mesa City Council</p>	<p>8:30am Jt. MWDOC/MWD Workshop (MWDOC/OCWD Boardroom)</p> <p>5:30pm OCWD Board Meeting (OCWD Boardroom)</p>		<p>Pay Period Ends</p> <p>7:30am R/S to 12/13 WACO Meeting (MWDOC/OCWD Boardroom)</p>	
8	9	10	11	12	13	14
	<p>5:00pm IRWD Board Meeting (15600 Sand Canyon Avenue, Irvine)</p>	<p>7:30am OCBC Infrastructure Committee Meeting (2 Park Plaza, Suite 125 Irvine, 92614; OCBC Conference Room)</p> <p>12:00pm R/S from 12/3 Executive Committee Meeting (Panian Conference Room)</p>	<p>Payday</p> <p>8:00am OCWD Water Issues Committee (OCWD Boardroom)</p> <p>8:15am LAFCO Meeting (Hall of Administration 10 Civic Center Plaza)</p> <p>8:30am MWDOC Admin & Finance Committee (Conference Room 101)</p> <p>11:30am CM Chamber Event</p>	<p>Colorado River Water Users Association Conference</p> <p>4:00pm CM Chamber Board Meeting (TBD)</p> <p>6:00pm Mesa Water Board Meeting (Boardroom)</p>	<p>7:30am R/S from 12/6 WACO Meeting (MWDOC/OCWD Boardroom)</p>	
15	16	17	18	19	20	21
	<p>8:30am MWDOC Public Affairs & Legislation Committee (Conference Room 101)</p>	<p>7:30am WACO Planning Committee (MWDOC Conference Room 101)</p> <p>3:30pm Engineering and Operations Committee Meeting (Boardroom)</p> <p>5:45pm Costa Mesa City Council Meeting (77 Fair Drive, Costa Mesa, California 92626)</p>	<p>8:30am MWDOC Board Meeting (MWDOC Boardroom)</p> <p>5:30pm OCWD Board Meeting (OCWD Boardroom)</p>	<p>8:30am MWDOC Executive Committee Meeting (Conference Room 102)</p> <p>11:30am OC Reuse Meeting</p> <p>3:30pm R/S from 12/23 Finance/LPAC Meeting (Boardroom)</p>	<p>Pay Period Ends</p>	
22	23	24	25	26	27	28
	<p>3:30pm R/S to 12/19 Finance/LPAC Meeting (Boardroom)</p> <p>5:00pm IRWD Board Meeting (15600 Sand Canyon Avenue, Irvine)</p>	<p>District Holiday</p>	<p>District Holiday</p> <p>Payday</p> <p>8:30am MWDOC/OCWD Jt. Planning (MWDOC/OCWD Boardroom)</p>			
29	30	31	Jan 1, 20	2	3	4
		<p>District Holiday</p>				



MesaWater
DISTRICT®

UPCOMING COMMUNITY OUTREACH EVENTS

<u>Environmental Nature Center 44th Annual Fall Faire & Pumpkin Patch</u>	Sunday, October 13, 2019 10:00 a.m. to 3:00 p.m.	<u>Environmental Nature Center</u> 1601 East 16th Street Newport Beach, CA 92663
<u>Segerstrom Center for the Arts "Fall For All"</u>	Saturday, October 19, 2019 1:00 p.m. to 5:00 p.m.	<u>Segerstrom Center for the Arts</u> 600 Town Center Drive Costa Mesa, CA 92626



*Dedicated to
Satisfying our Community's
Water Needs*

MEMORANDUM

TO: Board of Directors
FROM: Phil Lauri, P.E., Assistant General Manager
DATE: October 10, 2019
SUBJECT: Geographic Information System Support Services

RECOMMENDATION

Award a contract to Carollo Engineers, Inc. in the amount of \$140,000 per year for five years for an amount not to exceed \$700,000 with 2-one year renewal options to provide Geographic Information System and Hydraulic Model Hosting and Maintenance Services.

The Engineering and Operations Committee reviewed this item at its September 17, 2019 meeting and recommends Board approval.

STRATEGIC PLAN

Goal #2: Practice perpetual infrastructure renewal and improvement.

PRIOR BOARD ACTION/DISCUSSION

At its December 11, 2012 meeting, the Board of Directors (Board) approved a contract with RBF Consulting (a company of Michael Baker International) for \$95,500 to provide Geographic Information System Support Services.

At its August 8, 2013 meeting, the Board approved a change order with RBF Consulting (a company of Michael Baker International) in the amount of \$157,000 to provide Geographic Information System Support Services.

At its July 10, 2014 meeting, the Board approved a change order with RBF Consulting (a company of Michael Baker International) for an amount not to exceed \$133,500 to provide Geographic Information System Support Services.

At its November 12, 2015 meeting, the Board approved Change Order #3 to Michael Baker International (MBI) in the amount of \$325,000 for two and a half years.

At its July 16, 2019 meeting, the Engineering and Operations Committee received an information item that staff was preparing a Request for Proposal (RFP) for Geographic Information System (GIS) services.

BACKGROUND

Mesa Water District (Mesa Water®) has developed a versatile GIS that is central to managing its infrastructure assets. GIS is used to provide as-needed maps of Mesa Water's assets. GIS also functions as the backbone for the hydraulic model, record drawings database, pipeline breaks database, pipeline integrity testing database, and demographic and parcel information database. The GIS and hydraulic model are maintained by a consultant under the GIS Support Services contract, and Hydraulic Modelling Services contract. The contract term with the current GIS Support Services consultant expires in October 2019. Staff developed an RFP for GIS and



Hydraulic Model Hosting and Maintenance Services for Fiscal Years 2020-2025, with the option for 2-one year renewals.

Key tasks in the RFP include the following:

- Hosting of GIS on secure servers
- Maintenance of GIS software licenses
- Staff access to GIS viewer via WebGIS portal
- Maintenance and upkeep of asset database
- Hydraulic modeling to evaluate water supply, system pressure, water velocity with pipelines, etc.
- Update of Potable Water and Recycled Water Atlas
- Development of specialized maps as needed

DISCUSSION

Mesa Water solicited proposals from 13 qualified firms to provide GIS and Hydraulic Model Hosting and Maintenance Services. 11 of the 13 firms attended the pre-proposal meeting. From the 11 firms, eight proposals were received. The proposals were reviewed by a Selection Panel comprised of Mesa Water and City of Newport Beach staff. The top three firms were invited to participate in interviews. Each firm was evaluated based on qualifications, experience, staff availability, project understanding, scope of work approach, and proposal quality. The results are as follows:

Rank	Firm	Final Score	Billing Rate Range for Professional Staff (\$/hour)
1	Carollo Engineers, Inc.	4.91	\$139 - \$255
2	HDR, Inc.	3.97	\$ 85 - \$325
3	Michael Baker International LLC	3.32	\$ 97 - \$229

While all of the firms presented excellent approaches and highly qualified staff, Carollo Engineers, Inc. (Carollo) was unanimously ranked as the most qualified due to their experience of helping clients similar to Mesa Water create user-friendly GIS and Hydraulic Model applications and maps that support day-to-day operations. Their understanding of how Mesa Water staff uses GIS and the Hydraulic Model demonstrated in their proposal and their recommendations for helping Mesa Water take the next steps in integrating GIS with other systems were the most logical and the most implementable of all of the proposers. Carollo's proposal is included as Attachment A. Other proposals are available upon request.

Professional Services costs were evaluated and the proposed fees presented by Carollo were in alignment with industry standard rates for GIS and Hydraulic Modeling services.

Staff recommends that the Board award a contract to Carollo in the amount of \$140,000 per year for five years for an amount not to exceed \$700,000 with 2-one year renewal options to provide GIS and Hydraulic Model Hosting and Maintenance Services.



FINANCIAL IMPACT

In Fiscal Year 2020, \$302,000 is budgeted for Support Services; no funds have been spent to date.

ATTACHMENTS

Attachment A: Carollo Engineers, Inc.'s GIS and Hydraulic Model Hosting and Maintenance Services Proposal



Geographical Information Systems and Hydraulic Model Hosting and **MAINTENANCE SERVICES**



PROPOSAL | August 2019



August 22, 2019

Ms. Karyn Igar, PE, Senior Civil Engineer
Mesa Water District
1965 Placentia Avenue
Costa Mesa, CA 92627

Subject: Proposal – Geographical Information Systems and Hydraulic Model
Hosting and Maintenance Services

Dear Ms. Igar:

The GIS and Hydraulic Model Hosting and Maintenance Services is the foundation for Mesa Water's GIS system. Mesa Water® is seeking a professional engineering consultant to develop an ESRI-based web application as a common access point for staff to access Mesa Water's GIS data. Carollo Engineers' project team is exceptionally qualified to provide these services for several reasons:

Proven project leadership leads to project success. Tim Loper (project manager), Jackie Silber (GIS lead), and Matt Huang (modeling lead) are GIS specialists, system integration experts, and hydraulic modeling engineers who bring their expertise to work alongside Mesa Water's staff to help develop an easy-to-use, customizable, non-proprietary GIS system that easily integrates with Mesa Water's model and other asset management systems. They have helped clients just like Mesa Water® develop and implement robust modeling and GIS programs, and that experience has proven to lead to project success.

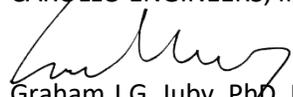
A deep bench of GIS and modeling resources provides efficient and timely project delivery. The ability to meet Mesa Water's needs throughout the five-year contract period is driven by our ability to deliver efficiently. Carollo will serve as the extension of Mesa Water's staff by updating the GIS and linking the digital assets to Mesa Water's asset management systems and other outside digital resources via a customized approach. We will also provide a qualified hydraulic modeling team to provide as-needed hydraulic modeling services on an annual basis.

No learning curve with Carollo's extensive knowledge and understanding of Mesa Water's entire water system. There will be no learning curve because we have gained knowledge of your water system through past work on projects such as the Nitrification Modeling Study, Chlorine Conversion Study, and 2014 Water System Master Plan.

We are pleased to offer this highly knowledgeable and experienced team to work with you and your staff to develop an accurate and updated model that meets the needs of the community for many years to come. If you have any questions, please contact our proposed project manager, Tim Loper, at 559-313-4802 or tloper@carollo.com.

Sincerely,

CAROLLO ENGINEERS, INC.



Graham J.G. Juby, PhD, PE
Vice President/Principal-in-Charge



Tim Loper, PE
Vice President/Project Manager



Proposal Cover Page

Name of Business: Carollo Engineers, Inc.

Business Address: 3150 Bristol Street, Suite 500, Costa Mesa, California 92626

Phone: 714-593-5100

Email: GJGJuby@carollo.com

Website: www.carollo.com

Federal Tax ID: 86-0899222

Type of Business: S Corporation

Years in Business: 86

Point of Contact: Graham Juby, PhD, PE, Vice President

Phone: 714-593-5134

Signatory Contact: Graham Juby, PhD, PE, Vice President

Phone: 714-593-5134

Certificate of Insurance: Included on the next page



Signature



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

8/2/2019

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Risk Strategies Company 2040 Main Street, Suite 450 Irvine, CA 92614 www.risk-strategies.com CA DOI License No. 0F06675	CONTACT NAME: Risk Strategies Company PHONE (A/C, No, Ext): 949-242-9240 FAX (A/C, No): E-MAIL ADDRESS: syoung@risk-strategies.com
	INSURER(S) AFFORDING COVERAGE NAIC # INSURER A : INSURER B : INSURER C : INSURER D : Continental Casualty Company 20443 INSURER E : INSURER F :

COVERAGES

CERTIFICATE NUMBER: 50399570

REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
	COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC OTHER:						EACH OCCURRENCE \$ DAMAGE TO RENTED PREMISES (Ea occurrence) \$ MED EXP (Any one person) \$ PERSONAL & ADV INJURY \$ GENERAL AGGREGATE \$ PRODUCTS - COMP/OP AGG \$ \$
	AUTOMOBILE LIABILITY <input type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS ONLY <input type="checkbox"/> NON-OWNED AUTOS ONLY						COMBINED SINGLE LIMIT (Ea accident) \$ BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
	UMBRELLA LIAB <input type="checkbox"/> OCCUR EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED. <input type="checkbox"/> RETENTION \$						EACH OCCURRENCE \$ AGGREGATE \$ \$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) <input type="checkbox"/> Y <input checked="" type="checkbox"/> N If yes, describe under DESCRIPTION OF OPERATIONS below		N/A				PER STATUTE <input type="checkbox"/> OTH-ER <input type="checkbox"/> E.L. EACH ACCIDENT \$ E.L. DISEASE - EA EMPLOYEE \$ E.L. DISEASE - POLICY LIMIT \$
D	Professional Liability Unlimited Prior Acts			AEH288354410	7/4/2019	7/4/2020	Each Claim: \$1,000,000 Aggregate: \$1,000,000 Deductible: \$400,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Projects as on file with the insured including but not limited to: Geographical Information System (GIS) and Hydraulic Model Hosting and Maintenance Services - RFP

CERTIFICATE HOLDER

Mesa Water District
 1965 Placentia
 Costa Mesa CA 92627

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Michael Christian

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ACORD 25 (2016/03)

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APPENDIX B. Professional Services Agreement Acceptance Form	



SECTION 1

Firm Qualifications and Experience

Carollo Engineers is a full-service, environmental engineering firm that has been exclusively providing water and wastewater services for 86 years across the U.S. **Water is our focus, our business, and our passion.**

Firm Introduction

Founded in 1933, Carollo Engineers has 45 offices in 18 states throughout the U.S., with employees numbering more than 1,100 including more than 500 registered engineers.

Unlike the majority of our competitors, we solely provide water and wastewater services, and that's where we focus our resources and energy every day of every year. As a result, we are known in the industry for our innovative solutions.

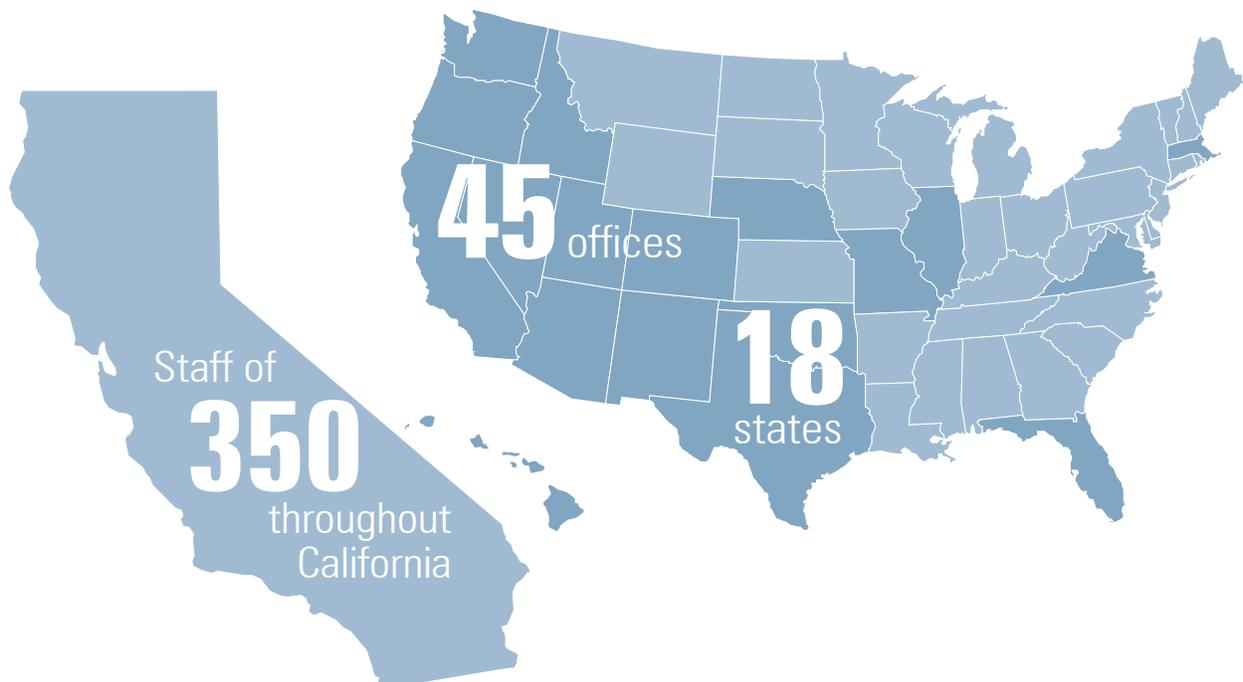
Strength and Stability

During our 86-year history, Carollo has successfully completed more than 25,000 projects. We are currently ranked within *Engineering News Record's* (ENR) top 500 design firms. More importantly, ENR's annual Source Book ranks Carollo among the top

10 firms for water and sewer/wastewater. We are the largest firm in the country that is 100 percent focused on water engineering solutions. With a reputation based on client service, you can expect from us a commitment to quality.

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 professionals equals or exceeds that provided by some of the largest engineering firms in the country.

Our staff includes civil, sanitary, environmental, electrical, mechanical, chemical, structural, control system, and corrosion control engineers, as well as architects, planners, and specialists in other areas. Consultants are retained as needed in specialized fields depending on a project's specific needs.



GIS and Modeling Capabilities

Carollo is a leader in helping agencies develop technological tools to support operation, maintenance, and existing business practices. We are experienced in creating workable, user-friendly GIS, computer models, and integration systems to support day-to-day data access. We are experts in the development and use of complex water system models that are integrated with GIS and asset management systems.

Our experience also includes the development of GIS web applications and hydraulic models. We bring expertise in performing geospatial analyses utilizing a variety of ArcGIS tools and geoprocesses to create and visualize GIS data. They create map documents, analyze GIS data, and link non-spatial data to GIS.

Office Location

The work for your project will be performed and managed through our Costa Mesa office located at 3150 Bristol Street, Suite 500, Costa Mesa, California 92626. This office, together with our total firm resources, has the capability and capacity to provide the range of services needed to complete your project.

Why Carollo?

There are two important reasons that make the Carollo team the best choice for your Geographical Information Systems and Hydraulic Model Hosting and Maintenance Services project:

1. Our extensive knowledge and understanding of Mesa Water’s entire water system.
2. Our recent experience with very similar projects.

These two key reasons to select Carollo for your project are spelled out in our proposal.

Relevant Experience

Just Ask Our Clients... Carollo is known for the large number of clients with whom we have maintained long-term relationships. Our experience shows that open communication, collaboration, and proven solutions build trust, minimize conflict, and eliminate surprises. On the following pages we have provided three project profiles with references who will attest to our level of service and responsiveness.

As requested in the RFP, brief descriptions of additional projects are included in the table below.

Additional Experience

Client/Project	Description
Mesa Water®, CA Chlorine Conversion Study	Performed a water source trace using a hydraulic model to determine which supply sources serve which customers.
City of Pasadena, CA Hydraulic Model Development	Created a new hydraulic model in InfoWater by Innovyze®. Conducted technical review of the model network and enhanced the model topology and added water system controls.
City of Morro Bay, CA OneWater Water and Wastewater Master Plan	Provided GIS analysis for project involving the addition of important invert elevation data in areas with data gaps so a model could be generated.
City of Lemoore, CA Water, Sewer, and Wastewater Treatment Plant Master Plans	Provided GIS analysis to help the City fill gaps in its wastewater network pertaining to elevation data and determine flow monitoring locations. Located and entered important elevation data and created cartographic figures for verification of flow monitoring locations.
City of Garden Grove, CA Water Master Plan	Developed a complete water system GIS; created a hydraulic model, demand projections, system analysis, CIP development, and prepared a master plan.
City of Shasta Lake, CA 2016-2026 Water Master Plan	Developed a new water system hydraulic model based on the City’s most recent GIS database of the water distribution system.

Accelerated Water Meter and Line Replacement Program

City of Sacramento Department of Utilities, CA

Point of Contact

Michelle Carrey, Engineering Supervisor, Water
1395 35th Avenue, Sacramento, CA 95822
916-808-1438 | mcarrey@cityofsacramento.org

Project Description

Carollo is providing program management and design services for the City of Sacramento's \$250M Accelerated Water Meter Program that consists of installing more than 41,000 water meters, and replacement of approximately 60 miles of water mains and service lines.

The program involves condensing the water service meter installation effort from eight years to four years. Using a web and mobile GIS application, our team developed a multifaceted outreach effort to build support for the program and communicate program activities relevant to the residents and businesses being affected by the work.

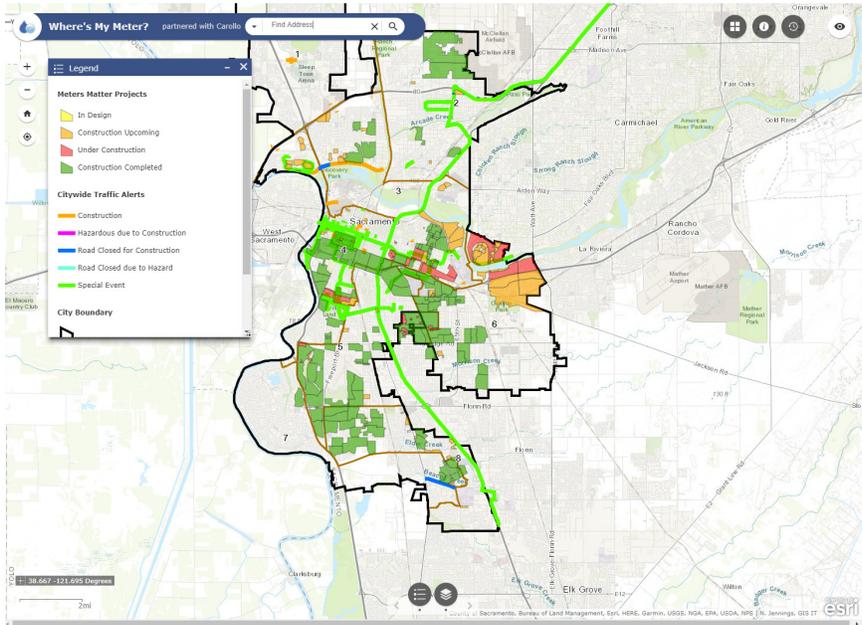
Using ArcGIS Online, a web application was developed to alert residents of meter installation status and traffic alerts related to meter installation

Relevance to Mesa Water®

- Data collection and management to interface with City's business systems and GIS.
- Website and mobile application based on GIS to inform public and stakeholders of program status and useful information.
- Developed workflows and procedures for quickly updating the GIS and uploading to the web application.

areas. The web application provides residents a way to search for their address, parcel APN, or project name. Updates to the web app required a full-time GIS analyst to support the City's meter installation timeline.

Carollo developed documented workflows and customized scripts to automate GIS database updates based on construction updates. The same GIS staff that developed this app for the City of Sacramento will assist Mesa Water®.



Link to web application: <https://sacmeterprogram.github.io/>

Northwest Model Expansion and Capacity Analysis

City of Reno, NV

Point of Contact

Dustin Waters, Associate Civil Engineer
 1 East First Street, Reno, NV 89501
 775-321-8352 | watersd@reno.gov

Project Description

The City of Reno retained Carollo to conduct a sanitary sewer capacity analysis and develop a master plan for the City's Northwest area. Carollo collected and reviewed existing GIS data, conducted site visits to gather additional information on the City's collection system, and interviewed staff to develop a better understanding of suspected operations and maintenance issues, flow diversions, and other collection system hydraulic information.

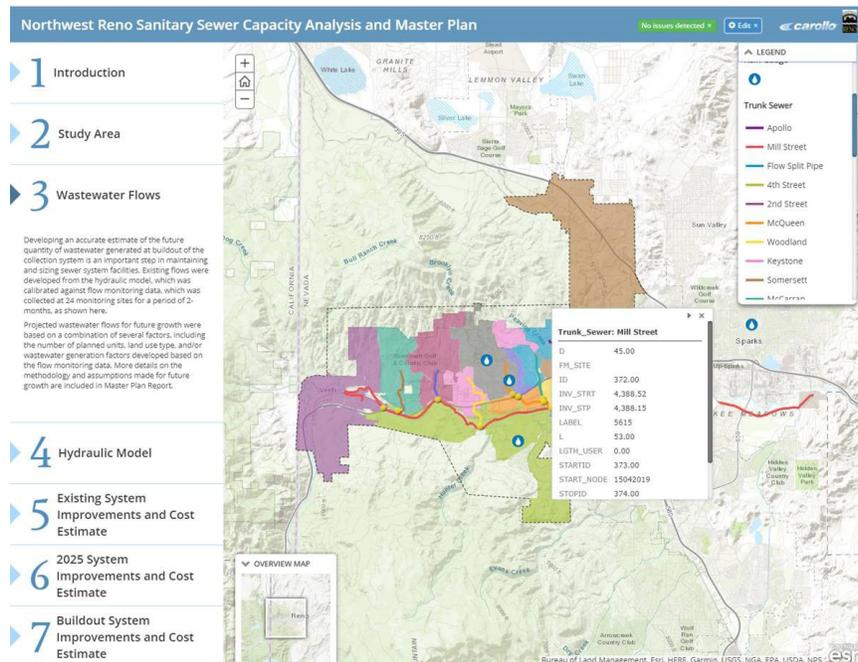
Beyond the typical master planning tasks such as development of a temporary flow monitoring program, and reviewing the City's existing model to expand the existing wastewater collection system hydraulic computer model, Carollo developed a web

Relevance to Mesa Water®

- Reviewed existing Sewer GEMS model.
- Developed temporary flow monitoring program using a GIS database.
- Developed a Story Map of CIP projects using ArcGIS Online.
- Projects displayed in the Story Map are linked to CIP project description PDFs.

based GIS application to share GIS data with internal City staff and the public through ESRI's ArcGIS Online.

The web application provided critical background related to project understanding, background information, project phasing, costs, and project specifics such as improvement specifications, justification, existing and future user cost allocations, and total project costs.



Link to web application:

<https://carollo.maps.arcgis.com/apps/MapSeries/index.html?appid=984476d1348d4736aaedced77cf9c760>

Northeast Water Purification Plant Project

City of Houston, TX

Point of Contact

Ravi Kaleyatodi, Senior Assistant Director
12630 Waterworks Way, Humble, TX 77396
713-346-0899 | ravi.kaleyatodi@houston.tx.gov

Project Description

Carollo has been tasked with providing oversight on the day-to-day construction of the Northeast Water Purification Plant (NEWPP) expansion project. Carollo developed a new approach to construction management through the development of an ArcGIS Online web application.

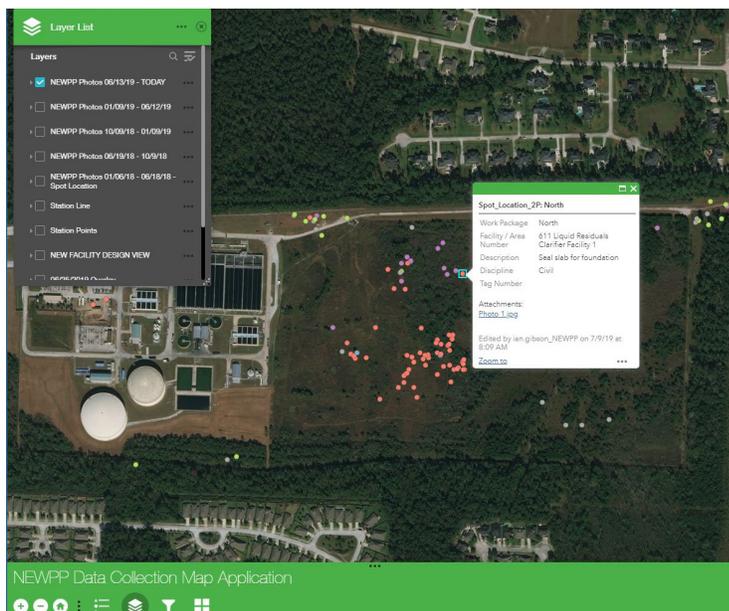
Carollo is considered the Project Management Team (PMT) for the expansion, which in layman's terms means we will be providing quality assurance to the stakeholders. One of the tasks of the PMT is to thoroughly report daily construction activities with pictures and descriptions. To do so, Carollo hired four inspectors that managed the quality of work being done by contractors on site. These inspectors went out every day to take pictures and notes on the various construction activities happening around the work area. At the end of each day, they rewrote their notes in a Word document, attached the photos, and uploaded the reports to a SharePoint server. Carollo found that this reporting method would not be scalable when the project expanded to 20 inspectors.

Relevance to Mesa Water®

- ArcGIS Online Web Application.
- Hosting large datasets.
- Data Collection Map– Used to show location of photo collection locations for pipeline assessment.

To simplify the reporting process, a web map was created using ArcGIS Online which contained a variety of fields for the inspectors to fill in. These fields consisted of dropdowns, auto-filled dates, and text areas that the inspectors found useful in making their job easier. Once created, the inspectors utilized the Collector for ArcGIS application on their mobile devices to capture the information. They were now able to take their phone or iPad into the field and document the work each day. There was no longer a need for the inspectors to rewrite the information into a Word document.

Additionally, each photo was geolocated to a place on the map that was important in the review process from each area manager. Being that the project area was so large, understanding the exact location of each activity was useful in providing assurance to the clients that each concrete pour, pipe lay, rebar installation, etc. was up to standard.



SECTION 2

Staff Experience and Availability

Nothing is more important to the success of your project than the qualifications and experience of your engineering team. Simple, one-size fits all solutions will not meet your expectations for a thorough third-party GIS team to host and maintain Mesa Water's GIS and hydraulic model systems.

You need a team of specialists.

THE RIGHT TEAM FOR MESA WATER®

The key to the success of Mesa Water's GIS and Hydraulic Model Hosting and Maintenance Services project will be the experience and abilities of the project team. A successful project team must demonstrate practical and relevant experience in all of the technical aspects of a project, a well-conceived project approach, and a commitment to the project goals.

Team Organization

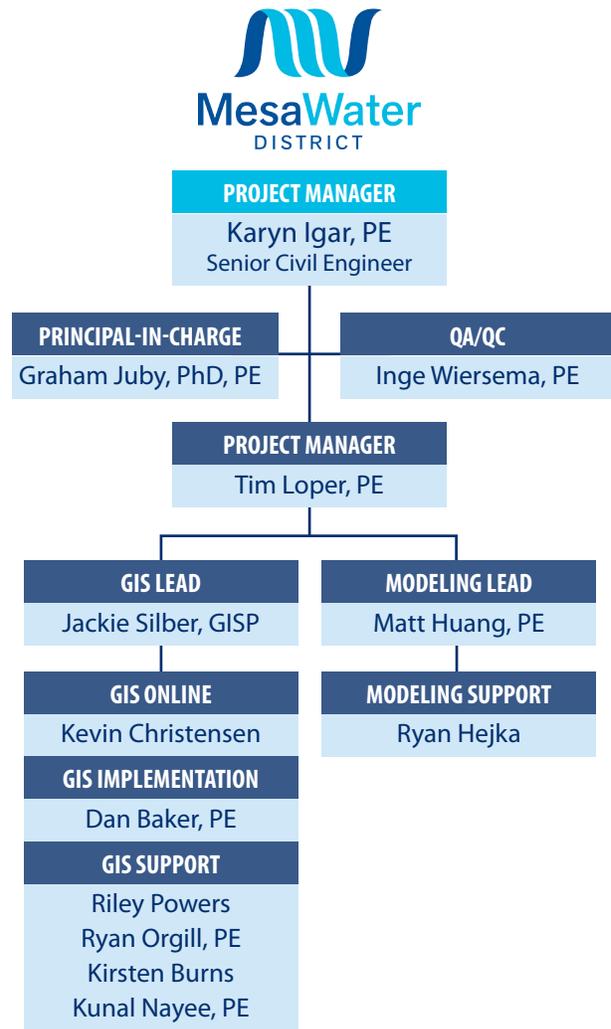
We have a team of responsive GIS specialists, system integration experts, and hydraulic modeling engineers to work alongside Mesa Water's staff to help you locate and manage digital assets at an affordable cost. Our team members will take a proactive role in providing services by identifying challenges before they become costly issues and developing proactive solutions for optimal results.

Resources

With a staff of more than 350 located throughout California, Carollo has the resources and systems in place to meet any of your project staffing needs. We have the ability to mobilize and respond quickly to your requests, both large and small.

Following are brief profiles showcasing the background and qualifications of our key team members. Resumes are provided in Attachment A. All of our team members are available and committed throughout the duration of this project.

Our team shows a deep bench of GIS resources. This allows us the ability to meet Mesa Water's needs throughout the five-year contract period.



LEADERSHIP TEAM



Tim Loper, PE
Project Manager

Availability: 50%

Tim is Carollo's Chief of Infrastructure Planning Services and has 18 years of experience in all aspects of water and wastewater engineering. Tim focuses on providing the right team to develop the right solutions for water-related challenges. With extensive experience in planning and design, his knowledge of available analytical methods, and robust evaluations provides the foundation for justifiable findings and results that support each agency's goals and needs.

As project manager, Tim will be the prime contact throughout the project. He will develop the budget and schedule, assign responsibilities, secure adequate staffing, monitor the technical approach, and represent the team at all meetings.

Relevant Experience

- Principal-in-charge for the City of Reno, NV, Northwest Reno Sewer Capacity Analysis and Master Plan.
- Principal for the Truckee Sanitary District, CA, Ongoing Hydraulic Modeling Assistance.
- Project manager for the City of Tulare, CA, Water Model Update and Calibration.
- Project manager for the City of Millbrae, CA, Water System Master Plan.



Jackie Silber, GISP
GIS Lead

Availability: 50%

Jackie is a GIS lead with 18 years of professional experience in GIS and technical training. Her experience includes geospatial GIS analysis for water resource planning, environmental remediation sampling, and demographic forecasting projects. Her GIS skills focus on geodatabase design and optimization, setting cartographic standards, scripting the automation of repetitive analysis using Python, and administering the Carollo's ArcGIS Online account.

Relevant Experience

- ArcGIS online administrator/technical advisor for the City of Houston, TX, Northeast Water Purification Plant.
- GIS lead for Mesa Water®, CA, Free Chlorine Conversion Study.
- ArcGIS online administrator for the City of Reno, NV, Northwest Model Expansion and Capacity Analysis and Master Plan Story Map project.



Matt Huang, PE
Modeling Lead

Availability: 30%

Matt brings 18 years of experience and expertise in water and recycled water hydraulic modeling and master planning, with more than 100 hydraulic models, and serves as Carollo's National Distribution System Modeling Lead. He also has a broad base of experience working in water quality, water and wastewater treatment, water and sewer infrastructure, water resources, and wastewater system modeling and master planning, with experience in planning, design, and construction. His project management background includes many large planning and design projects, with projects in ten states and seven foreign countries.

In addition, Matt has experience with a number of specialized computer programs, including InfoWater, H2OMAP, H2ONET, InfoSewer, InfoSWMM, InfoWorks WS, WaterGEMS, GoldSim, WEAP, and ArcGIS Desktop, as well as a number of database, programming, scheduling, and spreadsheet programs. He currently serves on AWWA's Engineering Modeling Applications Committee.

Relevant Experience

- Project engineer for Mesa Water's Nitrification Modeling Study and Chlorine Conversion Study.
- Project manager for Elsinore Valley Municipal Water District, CA, On-Call Hydraulic Modeling project.
- Task Leader for Inland Empire Utilities Agency, CA, On-Call Hydraulic Modeling Contract.



Graham Juby, PhD, PE
Principal-in-Charge

Availability: 20%

Graham has 36 years of experience in the planning and implementation of water and wastewater treatment projects.

During the last 20 years, he has served in management or advisory roles for numerous projects for Mesa Water®. His experience allows him to anticipate challenges that arise during the course of any project. He encourages an open line of communication between the client and project manager to create innovative solutions to challenges. Graham will have overall responsibility for the project, including quality control, staffing, and contractual matters. He will be available throughout the project to perform the stated responsibilities.

Relevant Experience

- Principal-in-charge for the 2014 Water System Master Plan for Mesa Water®, CA.
- Project manager for the 2016 Nitrification Control Study for Mesa Water®, CA.
- Principal-in-charge for the preliminary and final design for the Colored Water Treatment Facility Technology Replacement and Expansion project for Mesa Water®, CA.



Inge Wiersema, PE
QA/QC Technical Advisor

Availability: 20%

Inge is Carollo’s Southern California Regional Planning Manager and is an expert in developing comprehensive water master plans for public utilities. She has dedicated her 24-year career to hydraulic modeling and master planning, and has been involved in more than 150 master plans and modeling projects.

Inge will utilize her past work and lessons learned on previous successful modeling projects to provide quality management and technical oversight to Mesa Water®.

Relevant Experience

- Project manager for Mesa Water®, CA, Nitrification Prevention Modeling project.
- Project manager for the Metropolitan Water District of Southern California, CA, System-Wide Hydraulic Modeling Development.
- Project manager/engineer for the Los Angeles Department of Water and Power, CA, Hydraulic Model Planning project.

SUPPORT STAFF



Kevin Christensen
GIS Online

Availability: 20%

Kevin has six years of experience preparing map documents using GIS data of varying levels of complexity. He has performed geospatial analyses utilizing a variety of ArcGIS tools and geoprocesses to create and visualize GIS data.

Relevant Experience

- GIS analyst for the City of Oxnard, CA, Public Works Integrated Master Plan.
- GIS analyst for the City of West Sacramento, CA, Water Master Plan Update.
- GIS analyst for the Bella Vista Water District, CA, Urban Water Management Plan.



Dan Baker, PE
GIS Implementation

Availability: 20%

Dan has 27 years of experience in business management consulting for water utilities throughout the United States. He is Carollo’s lead for program management controls and business integration with diverse expertise in organizational assessments, information technology, asset management, CIP development, and strategic planning.

Relevant Experience

- Program controls lead for the City of Sacramento, CA, Accelerated Water Meter Program.

- Program controls lead for the City of Houston, TX, Northeast Water Purification Plant Program Owner’s Engineer/Agent project.
- Principal consultant for the Central Contra Costa Sanitary District, CA, Asset Management Implementation Plan, including integration of data into the GIS and maintenance management systems.



Riley Powers

GIS Support

Availability: 20%

Riley is a GIS analyst with prior work experience in water and wastewater infrastructure mapping with the City of Marquette, Michigan. He joined Carollo’s team in Reno in 2017. Riley’s skills focus on the collection and manipulation of data, creation and maintenance of geodatabases, conversion between program interfaces and data types for map creation, spatial analysis, and creation of cartographic figures.

Relevant Experience

- GIS analyst for the City of Reno, NV, Northwest Reno Sewer Capacity Analysis and Master Plan.
- GIS analyst for the City of Morro Bay, CA, OneWater Water and Wastewater Master Plan.
- GIS analyst for the City of Tumwater, OR, Comprehensive Water System Plan Update.



Ryan Orgill, PE

GIS Support

Availability: 20%

Ryan brings 15 years of experience dedicated specifically to infrastructure master planning projects. His expertise includes hydraulic modeling (water, sewer, and recycled water) in various software platforms, master planning, and GIS. Ryan specializes in creating and calibrating hydraulic models, development of analysis criteria, evaluation of existing water systems, and the development of improvement projects to mitigate existing deficiencies and to serve future growth.

He has conducted more than 50 hydraulic model updates and evaluations. He has worked on infrastructure master planning and hydraulic modeling projects for clients throughout the western United States, including California, Oregon, Washington, Nevada, Arizona, and Texas.

In addition, Ryan has worked with Tim Loper on more than 20 master planning projects, including recent projects for the cities of Morro Bay, Porterville, Fresno, Hanford, and Turlock.

Relevant Experience

- Project manager for the City of Reno, NV, Northwest Reno Sewer System Capacity Analysis and Master Plan.
- Project engineer for the City of Santa Barbara, CA, Water Model Update.
- Project engineer for the City of Shasta Lake, CA, 2016 - 2026 Water Master Plan.



Kirsten Burns

GIS Support

Availability: 20%

Kirsten has four years of experience in infrastructure design, modeling, and planning.

Her primary focus includes hydraulic model development, integrated with GIS, where she has developed new or updated existing hydraulic models, including providing system calibration and model training.

Relevant Experience

- Intern engineer for the Orange County, FL, Stormwater Inventory Project. Responsible for consolidation of stormwater inventory information in GIS including pump station and drainwell information for Orange County.
- Intern engineer for the Orange County, FL, Pond Mowing Study. Responsible for consolidation of pond information for Orange County contracted and non-contracted ponds with intent of producing mowing limits in GIS for maintenance of ponds.



Kunal Nayee, PE

GIS Support

Availability: 20%

Kunal has six years of experience ranging from GIS, permit writing, potable design, gravity design and data acquisition. His projects include hydraulic modeling for city- and county-level systems, asset management studies, and potable water system designs. Experience includes playing a central role in hydraulic water and wastewater models for a city-level system, asset management plan using GIS techniques for criticality modeling for a county-level forcemain system, and a potable water system replacement design for a city CIP.

Relevant Experience

- Project engineer for the Indian River County Wastewater Hydraulic Model Update, Indian River County, FL. Converted existing GIS information from the County into WaterCAD for use in a hydraulic model.
- Project engineer for the City of Coconut Creek Water/Wastewater/Stormwater Utilities Master Plan, Coconut Creek, FL. An existing asset management system created in house by Kunal and the Water Infrastructure Group customized to the City's GIS system and run to determine areas of the distribution system that require maintenance.
- Project engineer for the Mims Water System Pipeline Replacement, Brevard County, FL. Supported GIS data creation from existing CAD layers, partial clearance permitting, and other design support roles.



Ryan Hejka

Modeling Support

Availability: 20%

Ryan is a civil engineer with six years of professional experience specializing in water and recycled water system hydraulic modeling and master planning. He is skilled in the use of a wide variety of hydraulic modeling packages including InfoWater, H2OMAP, Mike Urban, and WaterGEMS.

Ryan also has extensive experience with ArcGIS and is proficient in multiple programming languages that he has utilized to build several customized water optimization models and tools for various water agencies.

Relevant Experience

- Staff engineer for the Nitrification Study for Mesa Water®, CA.
- Staff engineer/water system planner for the 2014 Water Master Plan Update for Mesa Water®, CA.
- Staff engineer for system-wide hydraulic model development for the Metropolitan Water District of Southern California.

CURRENT WORKLOAD

Our overall firm workload projections indicate that we have sufficient production capacity available for your project. Individual commitment will be consistent with job requirements to provide high-quality service to Mesa Water®.

From a project management standpoint, Carollo makes sure that each individual has adequate availability to meet the project requirements prior to assembly of the project team.

SECTION 3

Scope of Work Understanding

The GIS and Hydraulic Model Hosting and Maintenance Services is the foundation for Mesa Water’s GIS system. Mesa Water® is seeking a professional engineering consultant to develop an ESRI-based web application as a common access point for staff to access Mesa Water’s GIS data.

PROJECT UNDERSTANDING

The selected consultant will serve as the extension of Mesa Water’s staff by updating the GIS and linking the digital assets to Mesa Water’s asset management systems and other outside digital resources. In addition to the GIS system, Mesa Water® needs a qualified hydraulic modeling team to provide as-needed hydraulic modeling services on an annual basis.

What We’ve Heard from You

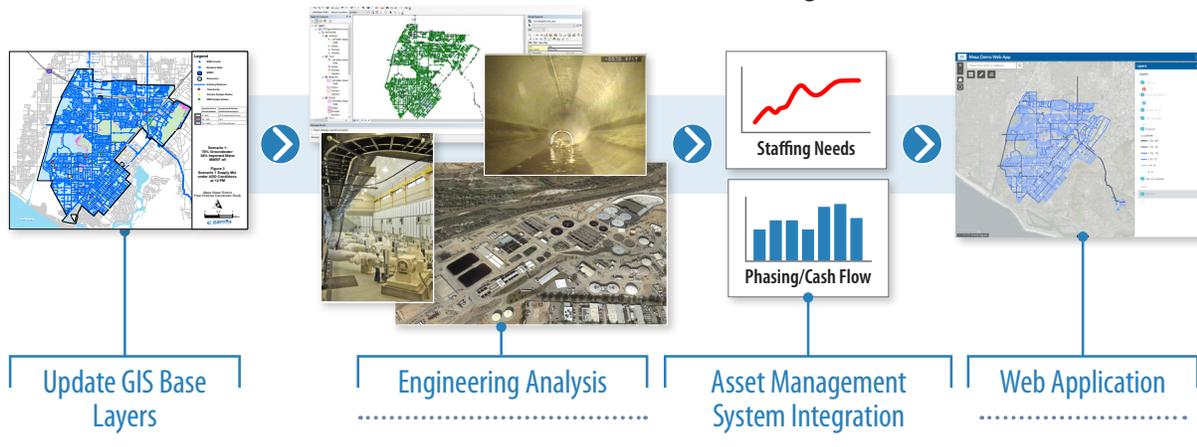
Mesa Water® has a web-based portal with a common login which hosts Mesa Water’s GIS, as well as GIS layers from the County of Orange and neighboring cities. Mesa Water® has defined a scope of work to develop a web application to host these GIS layers, establish a regular data update procedure, and update and maintain Mesa Water’s hydraulic model. You want your GIS and hydraulic modeling engineering team to provide an easy-to-use and secure web application that builds on the Free Chlorine Conversion Study hydraulic model created in 2018. You also want system integration between the routine updated GIS layers hosted in the web-based

application and Mesa Water’s four asset management systems. Most importantly, you also want the web-based access point to be secure, mobile-friendly, and deployed within two weeks of signing the contract. You need a team of responsive GIS Specialists, system integration experts, and hydraulic modeling engineers to work alongside Mesa Water’s staff to help you locate and manage digital assets at an affordable cost.

KEY CHALLENGES

In developing our understanding of this project, it’s clear that project success is defined by meeting **four key challenges**. In the sections that follow, we explain our approach to addressing each key challenge.

1. Develop a secure, easy-to-use web application that is up and running of two weeks of Notice to Proceed.
2. Develop pre-configured search functionality to meet Mesa Water’s needs.
3. Establish a 24-hour response team to update Mesa Water’s GIS.
4. Establish a framework to link GIS web portal with asset management software.



Carollo will be here to help Mesa Water® at each phase in the project.

Key Challenge #1. Carollo's approach offers a non-proprietary secure solution that can be established quickly to build a long-term platform for GIS data access.

You are looking for a common point of reference that is secure, quick to deploy, easy-to-use, and loads quickly on multiple devices. We recommend hosting Mesa Water's GIS data in ESRI's ArcGIS Online portal. ArcGIS Online (AGO) is a cloud-based mapping and analysis solution that is managed and secured by ESRI. Quick deployment of the web-based portal is critical to minimizing disruption to Mesa Water® staff. By using ESRI's Web AppBuilder to configure the ArcGIS Online portal, you will have a secure, searchable, mobile-friendly, fast-loading, web-based GIS with a secure login for each Mesa Water® employee—all within two weeks of receiving the Notice to Proceed.

OUR APPROACH

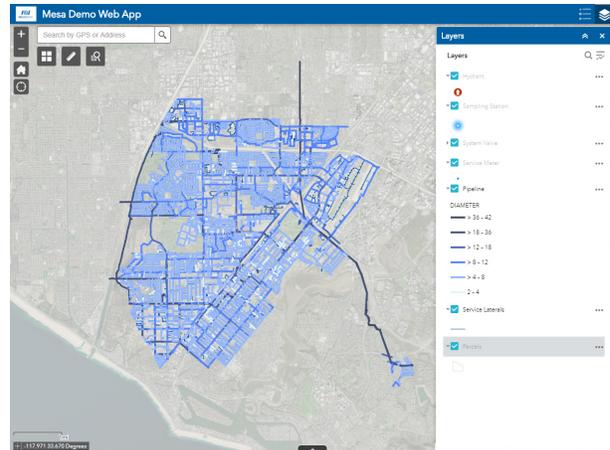
- Using ESRI's search engine, you will be able to search for an address or GPS coordinate.
- Utilize documented communication protocols to provide responsive GIS updates.
- Hosted by ESRI and secured access based on user account roles.
- Fast loading time by setting the visibility range for each layer.
- You own the AGO—we manage it for you.

ALREADY ON THE JOB

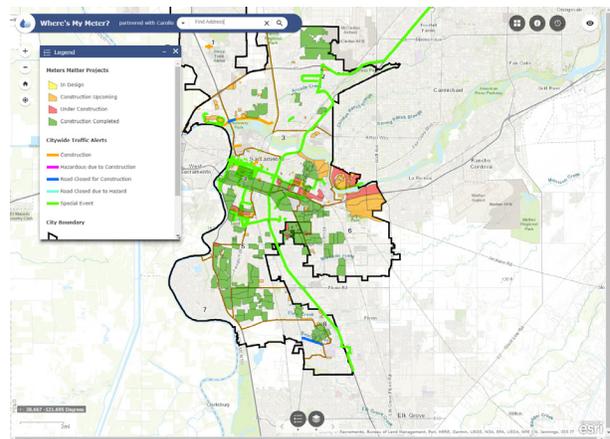
We have created a secure sample web application to give you an idea. Using the secure username: **MesaWaterDemo** and password: **M3s@W@t3r!** that only you have access to, we have created a sample web app for you to explore.

Please visit:

<https://carollo.maps.arcgis.com/apps/webappviewer/index.html?id=67219981356c402b9c52c87d86b2df5b>



Sample of Mesa Water's web application hosted in ESRI's ArcGIS Online.



Carollo is helping the City of Sacramento manage smart meter installation using AGO.

Building the web app on the ESRI platform will enable Mesa Water® to future-proof their digital assets. AGO provides the framework to enable field crew to edit GIS data using ArcGIS Collector.

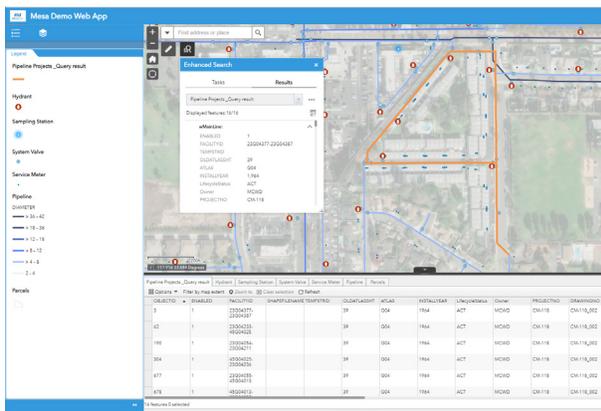
In addition, your data will be updated quickly and efficiently. Carollo has a team of talented GIS specialists that can update the master GIS database and the printable atlas based on record drawing, new customer meters, and service laterals. Once the data has been updated, our specialists will create a standard template that follows Mesa Water's branding guidelines as well as a symbology style guide to provide consistent symbology for mapping digital assets.

Carollo can help Mesa Water® locate high resolution full color orthoimagery at the 4 inch or higher resolution. If Mesa Water® already has a source for this imagery we can work to incorporate the imagery into the web app. If Mesa Water® has purchased the imagery, we can spin up an ArcGIS Image server to host the imagery and incorporate it into the web app.

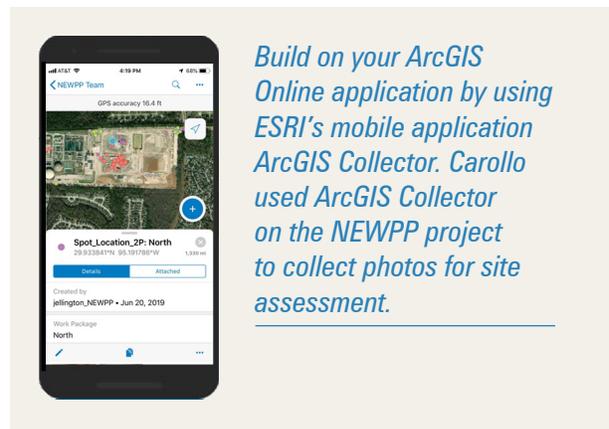
Key Challenge #2. Carollo's platform meets all standard requirements and allows for future enhancements to improve Mesa Water's GIS workflow and functionality.

Quick deployment of the web-based portal is critical to minimize disruption to Mesa Water® staff. By using ESRI's Web AppBuilder to configure the ArcGIS Online portal, you will have a secure, searchable, mobile-friendly, fast-loading, web-based GIS with a common login for each department—all within two weeks of receiving the Notice to Proceed.

Using ESRI's search engine, you will be able to search for an address or GPS coordinate. We will enhance the search functionality to search Mesa Water's GIS Layers with the Enhanced Search tool. The Enhanced Search tool will contain pre-configured search queries for each layer (pipelines, hydrants, etc.) to provide quick access to data you frequently query. The result is added as a temporary layer to the map along with a pop-up to confirm your search results. When you are ready to review all the attributes, a click of a button opens and displays the filtered set of attributes.



Our Mesa Water® app will provide the functionality you need based on an ESRI framework that will prepare you for the future.



Build on your ArcGIS Online application by using ESRI's mobile application ArcGIS Collector. Carollo used ArcGIS Collector on the NEWPP project to collect photos for site assessment.

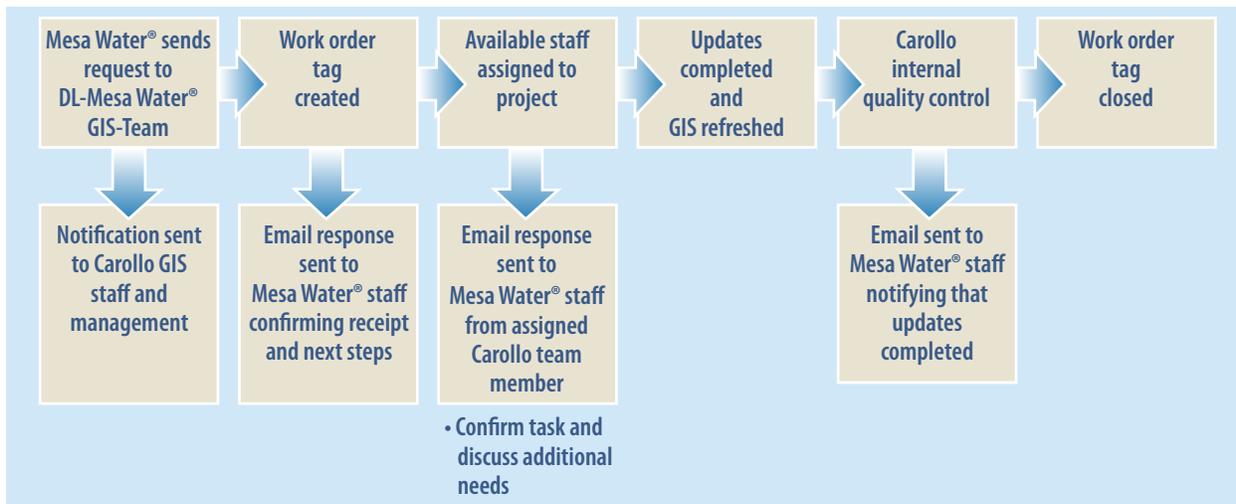
Basic functionality such as changing basemap layers and measuring areas will be added to the application. Security for cloud-based AGO web-applications is managed and secured by ESRI. Departmental user accounts will provide the right data based on privileges. User access controls and scale-based visibility ranges will help to provide fast loading times.

Key Challenge #3. Carollo's on-call GIS will follow a customized QA/QC workflow and work order generator to provide 24-hour response to GIS update requests.

Carollo's GIS specialists and hydraulic modelers have worked closely together for over a decade. Using the QA/QC workflow shown on the next page, we will work to quickly assign the right person to help update the GIS and/or hydraulic model, ask clarifying questions from Mesa Water® staff, and send the data for review to the GIS and hydraulic modeling leads before final review by Mesa Water®. Once Mesa Water® staff completes final review, the updated GIS will be posted to the web application.

Carollo's on-call system will include an extensive team of GIS and engineering professionals. As we have shown in our organization chart, our team includes three full time GIS professionals, but also multiple engineers to support Mesa Water® with efficient and quick GIS updates throughout the five-year contract period.

QA/QC Work Flow



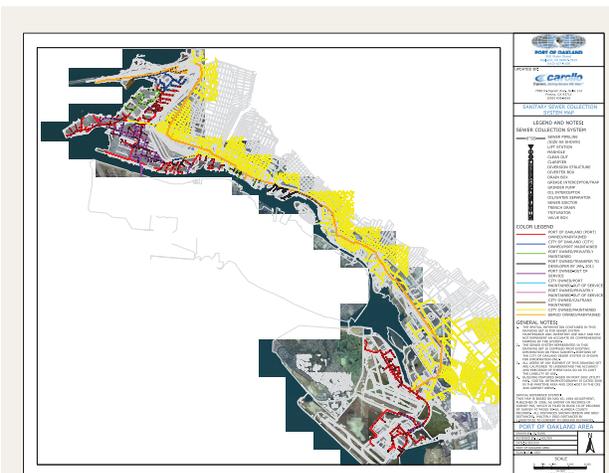
Carollo will complete multiple QA/QC steps along the way to check the quality of the GIS and model updates. Carollo will send Mesa Water® emails to keep you informed of our progress.

Key Challenge #4. Our GIS platform will allow seamless integration with Mesa Water’s existing asset management systems and software through REST APIs.

Mesa Water’s assets are managed in four separate applications. Carollo reached out to each of these vendors and confirmed these products are GIS-based. MaintStar in particular will be fully GIS-centric by the end of 2019 and will provide REST-based web services. These web services will allow Mesa Water® to click on an attribute link in the web app and open a connection to MaintStar to access facility IDs, valve information, etc. Cogsdale has a similarly GIS-centric system and has built development tools to access the data stored in SQL Server. (Cogsdale’s REST API development tools are available as a separate purchase.) Tokay and Waches Water Vitals are also ESRI’s based programs that can be linked to the data stored in the AGO web application.



ESRI-based asset management programs can be linked to the web application.



Carollo helped the Port of Oakland link their GIS system to a new set of Atlas Maps. Carollo worked with the Port to provide improved access to GIS data through easy to use formats.



Timothy J. Loper, P.E.

Timothy Loper has 18 years of experience in wastewater collection system modeling, water distribution system modeling, water system feasibility studies, wastewater treatment facilities planning, and infrastructure master planning.

Education

MS Environmental Engineering, University of California, Berkeley, 2005

BS Civil Engineering, California State University, Fresno, 2003

Licenses

Civil Engineer, California, Nevada

Professional Affiliations

Nevada Water Environment Association

American Water Works Association

Relevant Experience

→ Project engineer for the OneWater Morro Bay Master Plan, City of Morro Bay, California. The project included water system field data gathering (pressure logger installation, SCADA system data gathering, and fire flow test data). That information, combined with the City's GIS and as-built drawings, was used to develop dynamic hydraulic (water and sewer) and hydrologic (stormwater) models for those systems. The calibrated models were used to evaluate each system under both current and future scenarios. Based on this evaluation, deficiencies were identified and the associated improvements necessary to eliminate these deficiencies were determined.

→ Principal-in-charge for the City of Reno, Nevada, Northwest Reno Sewer Capacity Analysis and Master Plan. Carollo was retained to conduct a sanitary sewer capacity analysis and develop a master plan for the City's Northwest area. The team developed a temporary flow monitoring program; reviewed the City's existing SewerGEMS model to expand the existing wastewater collection system hydraulic computer model, including nine major trunk lines; calibrated the model using flow monitoring data; reviewed planning documents to determine existing and build-out wastewater flow projections; modeled existing and future system capacity evaluations; and developed prioritized, recommended capacity projects based on deficiencies.

→ Project manager for City of Tulare, California, Water Model Update, and Calibration. Tim was responsible for update and calibration of the City's existing water system model that was developed in the InfoWater hydraulic modeling software. Carollo worked closely with the City to collect and analyze SCADA data for water production to use in the development of maximum and average day demand peaking factors, as well as conducting a water system supply analysis to determine supply needs. Carollo

installed temporary pressure loggers to collect pressure data to be used for model calibration. Carollo used the updated model to conduct an analysis of the system deficiencies and to make recommendations on system improvements.

→ Project manager for the City of Millbrae, California, Water System Master Plan. Carollo was contracted by the City to complete a water master plan that provided a capital improvement program to help mitigate storage deficiencies and hydraulic constraints caused by the separation of their four pressure zones. Tim was responsible for the update and calibration of the hydraulic model that was developed in InfoWater. The City's primary concern was lack of storage in its lower pressure zone and the potential for emergency outages in the event of a large earthquake. Carollo conducted a seismic evaluation of the water storage tanks and the optimization of the storage needs of the lower zone and rehabilitation of existing tanks.

→ Project manager for the City of Fresno Kings River Pipeline and Southeast Surface Water Treatment Plant (SESWTP) Design Project. Carollo designed and provided engineering services during the construction of a new 80-mgd SWTF as part of a 10 year Metro Water Plan. The 72-inch transmission pipeline will divert raw water from the Kings River to SWTF for treatment and potable water distribution.

→ Quality control engineer for the City of Banning, California, Water and Wastewater Master Plan. The project involved updating the City's water, sewer, and recycled water master plans into an integrated master plan to guide the City with budgeting and implementation of capital improvement projects. Responsible for quality review and project oversight and technical direction.

→ Project engineer for the City of Oceanside, California, Integrated Master

Timothy J. Loper, P.E.

Plan, which included a new collection system hydraulic model prepared from GIS data using InfoSWMM. The existing system was evaluated with respect to existing and future capacity needs. The master plan also considered a phased plan for replacement of the City's water and wastewater pipelines as part of the rehabilitation and replacement program.

→ Project manager for the Shasta Lake 2016-2026 Water Master Plan, City of Shasta Lake, California. The project included development of a new water system hydraulic model based on the City's most recent GIS database of the water distribution system. The water distribution system hydraulic model was developed using the InfoWater hydraulic modeling software package, developed by Innovyze, Inc. The hydraulic model was calibrated using a three-step calibration approach, including a macro calibration, steady state (fire flow test) calibration, and an extended period simulation calibration.

→ Principal-in-charge for the ongoing Truckee Sanitary District, California, 2017 Hydraulic Modeling Assistance. The District hired Carollo provide assistance with the development and calibration of three of their four existing wastewater collection system models. The models are being calibrated to peak dry and peak wet weather flow conditions using flow monitoring data from the 2016 and 2017 storm season.

→ Project engineer for the Port of Oakland, California, Port-Wide Sewer System Management Plan, which was required to meet both the State and Regional Water Quality Control Board's Waste Discharge Requirements and to adhere to the Port's core business of operating the airport, seaport, and commercial real estate areas. Close coordination between three agencies (Port, City of Oakland, and East Bay Municipal Utility District) was necessary to develop accurate maps of the Port's sewer collection system and to establish the boundaries of responsibility among the three agencies.

The project included development of a fully dynamic (non-steady state) sewer system hydraulic model calibrated to both dry and

wet weather conditions. Carollo also conducted a sewer system facilities condition assessment; fats, oils, and grease control plan; overflow emergency response plan; sewer use ordinances; sanitary sewer design and construction standards; and other items required to meet the WDRs.

→ Project engineer for the City of Livingston, California, Water Distribution System Master Plan. Responsible for construction and calibration of the City's water system computer model to simulate existing conditions and development of evaluation and planning criteria. Also responsible for evaluation and determination of existing system deficiencies and development of system improvements to mitigate those deficiencies. The City of Livingston is unique in that 65 percent of the potable water from the distribution system is used for a single industrial customer. Provided support to the City for the implementation of a California Prop 218 water rate increase. Attended public hearings and meetings with industrial users and made presentations to the public and the City Council.

→ Project manager for Marin Municipal Water District, California, Water System Improvements Storage Tank Sizing Project. Tim was responsible for development and analysis of project documentation to support the District's environmental review of recommended tank improvements to support the District's Water System Improvement Program (WSIP). Carollo worked closely with the District to update the District's InfoWater hydraulic model and analyze multiple alternatives for the sizing of the Ross Valley and Five corners tank sites. Carollo worked closely with the District to develop alternatives that were acceptable for environmental and political considerations.

→ Collection system lead for the City of Riverside, California, Comprehensive Wastewater Master Plan. The Master Plan included both treatment and wastewater collections. Carollo built the City's collection system model using Innovyze's InfoSWMM modeling software.



Jackie M. Silber, GISP

Jackie Silber is a geographic information systems (GIS) lead with 18 years of professional experience in GIS and technical training. Her experience includes geospatial GIS analysis for water resource planning, environmental remediation sampling, and demographic forecasting projects. Her GIS skills focus on geodatabase design and optimization, manipulation and conversion of projections, CAD and KML to GIS conversion, spatial analysis, automation of repetitive analysis using Model Builder and Python, and creation of cartographic figures.

Education

MGIS, Penn State University, 2017

BA Geography, California State University, Northridge, 2001

AA Geology, Pasadena City College, 1997

Certifications

Certified Geographic Information Systems Professional (GISP), Geographic Information Systems Certification Institute, 2012

Relevant Project Experience

→ GIS lead for the Mesa Water District, California, Free Chlorine Conversion Study. Ms. Silber developed figures to illustrate the supply sources at different demand conditions.

→ ArcGIS online administrator/technical advisor for the City of Houston, Texas, Northeast Water Purification Plant.

→ ArcGIS online administrator for the City of Reno, Nevada, Northwest Model Expansion and Capacity Analysis and Master Plan Story Map project.

→ GIS specialist for the San Gabriel Valley Water Company Water System Master Plan Update, California. In addition to developing figures illustrating system deficiencies, Ms. Silber also developed a Python script to loop through an 11 million record table and sum the total water demands for every customer.

→ GIS specialist for the City of Banning, California. As part of the Integrated Master Plan, Ms. Silber developed figures representing the existing recycled water system as well as the proposed non-potable reuse system.

→ GIS specialist for the University of California, Irvine, Recycled Water System Analysis and Capital Improvement Program. Ms. Silber worked with hydraulic modelers to illustrate future system pressure deficiencies and pipeline velocities.

→ GIS specialist for the City of Medford, Oregon Sanitary Sewer Master Plan. To help the City anticipate future needs, Ms. Silber developed figures illustrating the locations of high I/I due to sewer trunk line deficiencies. Also investigated existing and future land use changes per parcel as part of a

wastewater capital charge per equivalent residential unit analysis.

→ GIS specialist for the Hillsborough County, Florida Capital Improvement Program. As part of the on-call potential Septic Replacement/Water Line Extension Program, Ms. Silber performed geospatial analysis to determine the number of septic parcels within wellhead protection and high hazard coastal areas. Additionally, produced figures of wastewater facilities and parcels served by current infrastructure.

→ GIS specialist for a Long-Range Wastewater Management Plan for the City of Renton, Washington. As part of the pipe risk approach, Ms. Silber developed an ArcGIS-based criticality and vulnerability model. The model identified and prioritized critical assets in close proximity to key infrastructure or that are susceptible to failure.

→ GIS specialist for the U.S. Agency for International Development (USAID) Infrastructure Needs Program Bulk Water Supply Systems Master Plan (Southern West Bank, Palestine). As part of a team responsible for defining the future water facility needs in the southern West Bank, developed GIS data, traveled to the West Bank, and presented the data to USAID and other key stakeholders. With the help of bilingual staff, also conducted a workshop for GIS specialists to review the data developed, which included three geodatabases and a file system of existing and recommended water and wastewater infrastructure. Pipeline data was imported from AutoCAD and created from heads up digitizing on aerial photography and was compared against the hydraulic schematic. Assisted project managers with locating potential wells/wellfields based on topology, cone-of-depression, and other hydrologic constraints. Additionally, elevation profiles from ground surface

Jackie M. Silber, GISP

data were created for proposed regional pipelines. Geologic scanned imagery was georeferenced to a common projection system and a file system was created to maintain organization. Also served as internal project coordinator for the final deliverable.

→ GIS specialist for the Los Angeles County Waterworks District 29, California, Water System Master Plan. Compiled and developed a water infrastructure geodatabase and geocoded the water billing data to correlate metered usage data with parcels. Using current land use and future zoning parcel data, analyzed water demands for private customers. Also created pressure zones and allocated commercial demands for fire flow in InfoWater.

→ GIS specialist for on-call GIS services for the City of Westminster Water Department, California. To provide current updates to the District's GIS data, Ms. Silber cleaned, projected, and updated the City's valves and hydrant attributes. Additionally, she cleaned the pipeline topology and created a map book for field personnel. The data was delivered and used as part of the training for water district personnel on using maintaining the map book.

→ GIS specialist for the Stormwater Capture BMP Site Suitability Analysis for the Upper San Gabriel River Enhanced Watershed Management Program, California. Using a uniform grid, performed a multi-criteria decision analysis of valued and binary constraints to identify potential stormwater BMP sites in the Watershed as part of the Los Angeles County MS4 Permit Compliance. The constraints were scored and weighted to rank the locations. Iterative tasks such as classifying the locations were automated using python scripts.

→ GIS specialist for the Mission Creek and Garnet Hill Subbasins Water Management Plan for the Coachella Valley Water District, Desert Water Agency, and Mission Springs Water Districts, California. As part of a collaborative groundwater replenishment program, analyzed population and other demographic projections and mapped the watersheds and multi-habitat conservation areas.

→ Lead cartographer for the Los Angeles Department of Water and Power (LADWP), California, Owens Lake Groundwater Evaluation Program, which is a collaborative program between LADWP and the Inyo County Water Department to evaluate use of groundwater for dust mitigation on Owens Lake. Provided GIS support for well location identification, and was responsible for managing the GIS data for the project. Working with hydrogeologists and modelers, mapped surface geology, groundwater contours, consumptive use, and water quality surrounding the Owens Lake Bed. Also produced well log illustrations.



Matthew M. Huang, P.E.

Matthew Huang is an expert on water and recycled water hydraulic modeling and master planning, but also has a broad base of experience, also working in water quality, water and wastewater treatment, water and sewer infrastructure, water resources, and wastewater system modeling and master planning, with experience in planning, design and construction. His project management background includes many large planning and design projects, with projects in ten states and seven foreign countries. In addition, Mr. Huang has experience with a number of specialized computer programs, including InfoWater, H2OMAP, H2ONET, InfoSewer, InfoSWMM, InfoWorks WS, WaterGEMS, GoldSim, WEAP, and ArcView GIS, as well as a number of database, programming, scheduling, and spreadsheet programs.

Education

MS Civil and Environmental Engineering, Stanford University, 1999

BS Applied Ecology, University of California, Irvine, 1998

Licenses

Professional Engineer, Oregon, Washington

Civil Engineer, California

Professional Affiliations

American Society of Civil Engineers

American Water Works Association

Relevant Experience

→ Project engineer for Mesa Water's Chlorine Conversion Study, California. This study performs a water source trace using the hydraulic model to determine under various operating conditions, which supply sources serve which customers. As Mesa is considering using both free chlorine and chloramines as disinfectants from different water supply sources, this study is performed to evaluate the potential impacts of the multiple disinfectant strategy to control nitrification.

→ Project engineer for Mesa Water District's Nitrification Study, California. Due to long detention times and large storage volumes, the District suffers from nitrification in their water distribution system. This study evaluates the feasibility of removing reservoirs from service in order to reduce water age and evaluating the impact of the hydraulics of the water system by doing so.

→ Project engineer for San Gabriel Valley Water Company's two water system master plans, for their Los Angeles County Division and for the Fontana Water Company. Mr. Huang served as the hydraulic modeling lead for this fast-paced project, completing two water system master plans within a five-month period. This project was in preparation for San Gabriel's rate case to the CPUC, providing project justifications for use in the rate case.

→ Project engineer for Antelope Valley East Kern Water Agency's Water System Master Plan, California. This first-ever master plan for AVEK provides a comprehensive evaluation of AVEK's demands, water supply reliability, water banks, water system, staffing, replacement programs, SCADA system, water

quality, design standards, and seismic reliability. These recommendations were combined into a Capital Improvement Program.

→ Project reviewer for City of Dallas' Water Master Plan, Texas. He was involved in the development of the hydraulic model, including hydraulic and water age calibration of a multi-million population water system. His involvement included regular model review as well as hydraulic modeling strategy development.

→ Project engineer for City of Camas' On-Call Hydraulic Modeling Services, Washington. Mr. Huang is serving as the primary hydraulic modeler for services for Camas, including impact of additional supplies, development of short-term strategies to meet growing demands, and impacts of new development on the water system.

→ Project reviewer for EPCOR's Agua Fria System Water Master Plan, Arizona. This distribution system master plan for one of EPCOR's systems evaluates the hydraulics and operations of EPCOR's system. Mr. Huang's role was review and consultation for the hydraulic model.

→ Project reviewer for the Pressure Zone Study City of Lacey, Washington. Mr. Huang provided technical review and hydraulic modeling assistance for a complicated hydraulic model. This study evaluated addressing low pressures in certain parts of the City's water system, with alternatives of creating a new pressure zone, new storage, and operational modifications. The study also included evaluation of water system operations with a key reservoir out of service for a six month period.

Matthew M. Huang, P.E.

- Project manager and technical review for Tualatin Valley Water District's On-Call Hydraulic Modeling Services, Oregon. Mr. Huang served as technical review for a master plan update for TVWD. He was also involved in supporting TVWD with hydraulic modeling requests associated with development of a new water source, reservoir replacement, and transfer of part of the water system to a neighboring agency.
- Project reviewer for City of Tumwater's Water System Master Plan, Washington. Mr. Huang provided hydraulic modeling review and technical advice on the development of the master plan, hydraulic modeling, and system improvement recommendations.
- Project reviewer for City of Prescott's Water Master Plan, Arizona. Mr. Huang provided hydraulic modeling review services for Prescott's InfoWater hydraulic model.
- Project reviewer for Albuquerque Bernalillo County Water Utility Authority, New Mexico. Mr. Huang provided technical support in the development of the hydraulic model, including model debugging in support of the project.
- Project manager for Elsinore Valley Municipal Water District's Western Murrieta Transfer Study, California. This project evaluates the feasibility for EVMWD to transfer water and serve Western Municipal Water District's Murrieta Division, identifying the required infrastructure, and defining costs for doing so.
- Project engineer for City of Torrance's High Zone Water Evaluation, California. On this project, Mr. Huang is responsible for completion of this work, which includes a hydraulic evaluation of three pump stations feeding a pressure zone.
- Project engineer for Clackamas River Water, Water System Master Plan, Oregon. Mr. Huang is serving as Project Engineer for CRW's master plan, updating the comprehensive master plan after 12 years since the previous plan. He is responsible for all aspects of the plan, including demand projections, hydraulic modeling, system evaluation, and CIP development.
- Project reviewer for City of Salem Unidirectional Flushing Pilot Program, Oregon. Mr. Huang provided technical review for Salem's UDF study, developing flushing runs for a portion of Salem's system.
- Technical expert for Woodinville Water District's Water System Master Plan, Washington. Mr. Huang provided technical assistance on the operation of Woodinville's water hydraulic model to resolve runtime errors and allow the model to be used for necessary evaluations.
- Project engineer for Marin Municipal Water District's Pine Mountain Tunnel Replacement Evaluation, California. MMWD is taking a tunnel, which is used as a reservoir out of service, and the one of the recommended sites for a replacement reservoir was found to be infeasible. In this project, Mr. Huang performed hydraulic modeling to evaluate the impact of removing these two reservoirs out of service under normal and emergency situations, and replacing an existing storage tank with a larger one at the same location.
- Project reviewer for City of Camas Water Master Plan, Washington. Mr. Huang provided thorough technical review of the hydraulic model of Camas' water distribution system, recommending modifications to hydraulic model controls and setup, and modifications to recommended capital improvement projects.
- Project engineer for the Pasadena Water and Power Hydraulic Model Calibration. Mr. Huang's team was responsible for collecting field data, adding model controls, creating diurnal curves, and calibrating the model for both fire hydrant tests and for an extended period simulation.
- Senior hydraulic modeler for the Cucamonga Valley Water District's Water Master Plan, California. He performed the hydraulic model calibration and evaluation of the water system. CVWD developed in house their first all pipe model, and Mr. Huang was responsible for calibrating the model, and used the model to evaluate the water system under existing and buildout demand conditions.



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

Dr. Graham Juby, a vice president with Carollo Engineers, has 36 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.

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)

Relevant Experience

→ Principal-in-charge for the 2014 Water System Master Plan for Mesa Water District, California. This ongoing assignment involves demand projections, water supply analysis, hydraulic model update and calibration, extensive field condition assessment, and development of an optimization model. As part of the field condition assessment, all water system facilities (8 groundwater wells, 1 treatment plant, 2 reservoirs, 2 booster stations, and imported water connections) were visited. In addition, 2 miles of non-destructive pipeline testing was done. The findings of the modeling and condition assessment analysis were combined into a comprehensive CIP and water master plan report

→ Project manager for the preparation of a Water System Master Plan for the Mesa Water District, California. He worked directly with Mesa staff to prepare a Water System Supply Plan, an Emergency Supply Plan, and a Water System Operations Plan for the master plan. He assisted Mesa staff to complete the Capital Improvement/Replacement Plan to identify budgetary requirements through the year 2010.

→ Project manager for the Colored Water Project, in the role of the owner's engineer, for the Mesa Water District, California. The project involved the preliminary design (approximately 30-percent design) and design/build/bid documents and specifications for a new treatment facility to remove natural color from groundwater. The project included pre-qualification of design-build teams as well as pre-qualification of major equipment manufacturers. The project also included a 1.25-million gallon reservoir and high lift pump station, and an evaluation of

nanofiltration as an alternative treatment process. Also included was design criteria development for a 15-t/d liquid oxygen (LOX) storage, evaporation, and delivery system. Carollo was retained during the construction phase to confirm the predesign concepts were provided by the design/builder.

→ Principal-in-charge for the preliminary and final design for the Colored Water Treatment Facility Technology Replacement and Expansion project for Mesa Water District, California. The project involved designing a new 9-mgd nanofiltration (NF) treatment facility to treat higher level colored water from two on-site wells at the Orange County Groundwater Basin by replacing the existing ozone and biologically enhanced activated carbon (BAC) filtration system. The process will recover up to 98 percent of the feed water as potable water and includes hydrogen sulfide and methane stripping facilities and use of the existing on-site storage and pumping equipment. The plant was brought on line in 2012.

→ Principal-in-charge for the Well Automation and Rehabilitation Project for Mesa Water District, California. Carollo is preparing contract plans, specifications, and construction cost estimates for the automation, rehabilitation, and facility retrofits of Mesa Water's five clear water wells (Wells 1, 3, 5, 7, and 9) and supporting site facilities.

→ Principal-in-charge for the Finished Water Quality Polishing Project for Mesa Water District, California. Carollo prepared contract plans, specifications, and construction cost estimates for the design of a permanent sodium bisulfite chemical feed and storage system as well as miscellaneous improvements at Mesa Water Reliability Facility

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

(MWRP). Four areas were identified for improvement during the project: sodium bisulfite storage and metering, degasifier clean-in-place system, carbonic acid injection, and finished water chemical addition. Carollo was hired by Mesa Water to investigate and propose solutions to the operational issues identified for each of these areas.

→ 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 for planning investigations for Poseidon Resources Corporation, California, to provide desalinated seawater to a Southern California county. Preliminary modeling using H₂ONET[®] was used to assist with the evaluation of a number of alternative schemes to introduce water into the existing distribution pipework.

→ Project specialist on a team for establishing the realistic capacity of the Western Municipal Water District, California, Riverside Regional Water Quality Control Plant. Duties included preparing a process model for the nominal 40-mgd plant, evaluating plant performance data, calibration of the process model, and determining the allowable loading rates of the treatment processes. One important aspect of the analysis was determining the nitrogen removal capacity of the plant. Influent N-loads and de-nitrification capacity were used in the analysis to determine the effluent TIN expected when the plant reaches full capacity.

→ Principal-in-charge for the Stormwater Master Plan for the City of Torrance, California. The project included development of a Storm Water Quality Management Plan with the capability to model various land use and storm water Best Management Practices.

→ Principal-in-charge/project manager for preliminary design of a new brackish water desalting facility for Indian Wells Valley Water District, California. The project included developing a well sampling protocol;

screening treatment processes that could deal with the wide range of contaminants in the water, such as selenium, arsenic, etc.; evaluating three feasible treatment trains from which one will be selected for further analysis; preparation of a site layout, process flow diagram, and hydraulic profile for the selected train; as well as estimating the cost of the treatment process.

→ Principal-in-charge for the Treatment of Perchlorate in Contaminated Groundwater project for the Castaic Lake Water Agency, California. The project involved evaluating perchlorate treatment options, pilot testing optimum alternatives, and designing a treatment train able to address multiple contaminants. Developed a membrane treatment train model to assist with selection of appropriate technologies for pilot testing.

→ Project manager for the preliminary design evaluation of brackish groundwater for the Indian Wells Valley Water District, California. The project first involved establishing the water quality in the North Well Field area as a source for potable treatment. Several treatment trains were then developed and modeled to treat the brackish water that contained elevated levels of iron and silica.

→ Principal-in-charge for an evaluation of alternatives to replace 26 mgd of potable water used for agricultural irrigation with high quality reclaimed water for the Rancho California Water District, California. Mass balance models for seven treatment alternatives were prepared to evaluate the capacity of the unit processes when treating wastewater effluent.

→ Principal-in-charge for the ongoing 2016 Wastewater Facilities Master Plan Update for the Eastern Municipal Water District (EMWD), California. This ongoing assignment involves 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 wastewater treatment facilities. Capital costs were developed to take all facilities to their ultimate capacities in the year 2060.



Inge Wiersema, P.E.

Inge Wiersema is an environmental engineer with 24 years of experience and is specialized in water system planning and water resources projects. She has been involved in more than 100 master planning and hydraulic modeling projects for water, recycled water, wastewater, and stormwater systems in Southern California.

She has also worked on various groundwater management plans, watershed management plans, urban water management plans, sewer system management plans, and water supply studies. Her technical experience also includes conceptual and preliminary design of pipelines, pump stations, and water treatment plants.

Education

MSc Environmental Engineering, Agricultural University, Wageningen, Netherlands, 1997

BS Environmental Engineering, Hogeschool Van Utrecht, Netherlands, 1995

Licenses

Civil Engineer, California

Professional Affiliations

American Water Works Association

Association of Women in Water, Energy, and Environment

Water Environment Federation

WaterReuse Association (Technical Chair of Los Angeles Chapter)

Relevant Experience

→ Project manager for the nitrification prevention modeling project for Mesa Water District, California. This project was a follow-up of the 2016 Nitrification Study and involved detailed hydraulic modeling analysis for a variety of reservoir and system configurations to reduce water age in the system. The findings were presented in a report and used to guide the district with system configuration and operational changes.

→ Project manager for the Nitrification Study for Mesa Water District, California. This project involved the analysis of extensive field data gathering and laboratory testing to identify trends and solutions for nitrification events. In addition, hydraulic modeling analysis was conducted to identify potential hydraulic contributing factors, such as water age. Findings were presented in a comprehensive report, including a nitrification mitigation and prevention plan.

→ Project manager for the 2014 water master plan for Mesa Water District, California. This project included demand projections, water supply analysis, hydraulic model update and calibration, extensive field condition assessment, and development of an optimization model. As part of the field condition assessment, all water system facilities (eight groundwater wells, one treatment plant, two reservoirs, two booster stations, and imported water connections) were visited. In addition, 2 miles of non-destructive pipeline testing was done. The findings of the modeling and condition assessment analysis were combined in a comprehensive CIP and water master plan report.

→ Project manager for the Hydraulic Water Quality Modeling project for the City of Glendale, California. The project included

the preparation and calibration of an all-pipe hydraulic model created from a geographic information system (GIS), modeling training, assistance in preparation of the City's Initial Distribution System Analysis (IDSE) Plan, and additional water quality modeling. She conducted a number of water-age and water-quality modeling analyses to assist with the IDSE Plan and identify sampling station influence zones.

→ Project manager for the Water Master Plan for the City of Garden Grove, California. The project included development of a complete water system GIS, creation of a hydraulic model, demand projections, system analysis, CIP development, and preparation of a master plan. The model was calibrated for average and maximum day demands, as well as for water quality parameters.

→ Project manager for the Water and Recycled Water Master Plan Update for the City of Ontario, California. The project included potable and recycled water demand projections for both the existing city (Old Model Colony) and the recently annexed expansion (New Model Colony). Two new hydraulic models were created in H2OMAP Water® for the potable and recycled water systems. The potable water model was created from a geographic information system (GIS) and calibrated for seven days.

→ Project engineer for the Pomona Water and Recycled Water Master Plans for the City of Pomona, California. The project included creation and calibration of water, recycled water, and sewer models using the City's geographic information system (GIS).

→ Project manager for a Water Master Plan for the Elsinore Valley Municipal Water District, California. An all-pipe hydraulic model

Inge Wiersema, P.E.

for the entire district was created from the District's geographic information system (GIS).

→ Project manager for the Water System Pressure Zone Analysis for the City of Torrance, California. This project included hydraulic modeling analysis of six alternatives to evaluate potential rezoning of the City's High Zone to improve system reliability. In addition, the addition of a new pressure zone in the north part of the City was evaluated to mitigate high pressures.

→ Project manager for the hydraulic model development for the City of Pasadena, California. As part of this project, a new hydraulic model was created in InfoWater by Inno-vyze. Carollo conducted technical review of the model network and enhanced the model topology and added water system controls based on communications with the City's operations staff. A model calibration plan was prepared and the model will be calibrated for extended period simulation conditions. The model development process was documented in a report along with a model maintenance manual.

→ Project manager for system-wide hydraulic model development for the Metropolitan Water District of Southern California. As subconsultant to DHI, Carollo assisted in the development, calibration, and validation of four separate hydraulic models that collectively cover Metropolitan's entire conveyance system. The models were developed in Mike Urban modeling software.

→ Project manager for on-call water system modeling for the City of Santa Barbara, California. As part of this on-call contract, various modeling studies were conducted related to the new desalination plant. Each study was summarized in separate technical memoranda. Studies completed to date include: 1) Conveyance Alignment Study to support the preliminary design report of the desalination plant; 2) Energy Optimization Study for various production scenarios; 3) Extreme Drought Analysis with various supply options; and 4) Transmission Main analysis to serve Montecito Water District. An executive summary report was prepared that combined all studies.

→ Project manager for the on-call hydraulic modeling for the City of South Pasadena, California. The project consisted of various hydraulic modeling evaluations to the hydraulic impact and new water system infrastructure requirements when new developers are connected to the existing distribution system. The model that was developed and calibrated during a previous project was utilized for these studies.

→ Project manager for the hydraulic water system and pressure zone analysis for the City of Banning, California. This ongoing project includes the compilation of a City-wide model from multiple hydraulic models, storage analysis, storage siting, and preparation of a technical memorandum.

→ Project manager for the hydraulic model update project for the City of Santa Barbara, California. This project involved updating the existing water distribution system hydraulic model with recent GIS pipelines, geocoding of 2013 water billing records, updating facility controls, and recalibration.

→ Project manager for the hydraulic model development and Northeast Planning Study for the Yorba Linda Water District, California. The project included update of the District's hydraulic model, a two-week hydraulic calibration, and a water-quality calibration using InfoWater™ MSX software. The updated model was used for the planning study that identified system improvement needed to serve the District's last large infill development.

→ Project manager for the hydraulic model development project for the City of South Pasadena, California. The project consisted of the development of a new hydraulic model from water atlas maps, model calibration, documentation, and training. A detailed field testing plan was developed and executed to collect extensive field data for fire-flow, C-factor, and extended period simulation (EPS) calibration of the old and aging water system. Hydraulic model training was also provided at the end of the project.



Education

AAS Geographic Information Management, Green River Community College, 2013

Kevin R. Christensen

Kevin Christensen has experience preparing map documents using geographic information systems (GIS) data of varying levels of complexity. He has performed geospatial analyses utilizing a variety of ArcGIS tools and geoprocesses to create and visualize GIS data. Kevin has experience working on master planning projects for Carollo planning teams across the west coast. His duties include creating map documents, analyzing GIS data, and linking non-spatial data to GIS.

Relevant Experience

→ GIS analyst for the City of Oxnard, California, Public Works Integrated Master Plan. Responsible for creating map documents that show the City's sanitary sewer, potable water, reuse water, and stormwater systems.

→ GIS analyst for the City of West Sacramento, California, Water Master Plan Update. Responsible for creating and editing map documents that displayed the water distribution system and land use data.

→ GIS analyst for the Bella Vista Water District, California, 2010 Urban Water Management Plan. Assisted in population projections for the service area and created figures displaying the water system and population projections.

→ GIS analyst for the City of Glendale, California, 2013 Integrated Master Plan. Responsible for creating figures displaying the City's water system.

→ GIS analyst for the City of Auburn, Washington, Water System Plan Update. Assisted in editing map documents that display the City's current and future water system.

→ GIS analyst for the City of Bainbridge Island, Washington, Water System Plan. Assisted in editing the water system and land use map documents.

→ GIS analyst for the City of Auburn, Washington, Water Model On-Call Services. Involved in developing a set of unidirectional flushing program map documents. Responsible for creation of proposed directional flushing map figures that display the direction the pipes are flushing.

→ GIS analyst for the City of Stanwood, Washington, 2014 Water System Plan update. Updated the map documents

based on a new influx of data. Duties included updating the capital improvement program and land use map documents.

→ GIS analyst for the City of Ashland, Oregon, TAP Emergency Supply Project. The project involved developing a transmission main to go from the City of Talent, Oregon, to the City of Ashland to relieve drought conditions. Responsible for mapping the water system improvements including the new pump station and new transmission main.

→ GIS analyst for the City of Modesto, California, Wastewater Collection Master Plan. Responsible for creating map documents that show the City's sanitary sewer system and land use data.

→ GIS analyst for the City of Modesto, California, River Trunk Realignment, Bead Brook Siphon and Cannery Segregation Project. Responsible for creating figures that showed the existing alignment, problem areas, and recommendations for the project area.

→ GIS analyst for the Navy Yard City, Washington. Responsibilities include converting a list of sewer defects captured by the client into a figure for analysis. The analysis was based on the type and severity of sewer defects within the Navy Yard City sewer system to create a heat map of possible problem areas. Engineers then took steps to create a set of proposed improvements to the sewer system in the Navy Yard City area.

→ GIS analyst for the City of Cottage Grove, Oregon, Storm Drainage and Sanitary Sewer Master Plan Update. Responsible for updating and creating new figures for the Cottage Grove Sanitary Sewer and Storm Drainage Master Plan update.

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Daniel P. Baker, P.E.

Daniel Baker has 27 years of experience in business and management consulting for water and wastewater utilities throughout the United States. His education and experience as a professional civil and environmental engineer provides him with the insight to understand his clients' engineering, business, and technology goals. He has managed numerous complex planning and implementation projects for large utilities and municipalities that have drawn on his expertise in a wide range of areas including performance assessments, asset management, operations and maintenance management, information systems, master planning, system optimization, and capital program development. His relevant experience includes:

Education

MS Civil and Environmental Engineering, Massachusetts Institute of Technology, 1997

BS Civil and Environmental Engineering, Villanova University, 1994

BA Honors Program, Villanova University, 1994

Certificate, Certified Construction Documents Technologist (CDT), Construction Specifications Institute

Licenses

Civil Engineer, California, Arizona

Professional Affiliations

American Water Works Association, Information Management and Technology Committee Member

Water Environment Federation, Automation and Information Technology Committee Member

California Water Environment Association, Member

AZ Water Association, Member

Project Management Institute, Member, currently pursuing PMP certification

Relevant Experience

- Program controls lead for the City of Sacramento, California, Accelerated Water Meter Program. The project includes data collection and management to interface with City's business systems and GIS.
- Program controls lead for the City of Houston, Texas, Northeast Water Purification Plant Program Owner's Engineer/Agent project.
- Principal consultant for the Asset Management Implementation Plan, Central Contra Costa Sanitary District, California. Assisted in asset management framework development for standardized condition assessment of CCCSD's treatment and collection system facilities. Also provided recommendations on integration of condition assessment and risk analysis data into CCCSD's GIS and maintenance management systems.
- Project manager for the El Estero Wastewater Treatment Plant Asset Management Support Services for the City of Santa Barbara, California. He led the development and implementation of an asset management program for the El Estero Wastewater Treatment Plant and sewage lift stations including upgrades to the maintenance program, computerized maintenance management system (CMMS) reporting, inventory management, procurement process, and a capital improvement program (CIP) asset renewal plan.
- Principal consultant for the Sanitary Sewer System Planning Project and Asset Management Support for the Port of Oakland, California. The project included assistance with review and update of the man-

agement programs for the wastewater collection system including the Sewer System Management Plan (SSMP) and requirements related to the Environmental Protection Agency's Administrative Order for the City and Port of Oakland. He provided support for data improvements and integration of the Port's Oracle® EAM system with GIS and closed-circuit television (CCTV) inspection programs.

- Project manager for the Asset Reliability Assessment and Financial Plan Project for the City of Simi Valley, California. He was responsible for development of the overall asset management program for the City's wastewater treatment plant and collection system. The project included complete asset inventory, condition assessment of above-ground assets, GIS-based analyses of below-ground assets, risk-based assessments for probability and consequence of failure, asset valuation, rehabilitation and replacement (R&R) capital improvement program development, and a financial plan including proposed rate adjustments.

- Principal consultant for the Miramar Pump Station Condition Assessment for the San Diego County Water Authority, California. The project included mechanical, structural, electrical, and instrumentation condition assessments of the Miramar Pump Station. He developed a renewal decision analysis report that evaluated alternatives for rehabilitation and replacement, conducted a life-cycle cost analysis that compared the alternatives, and provided final recommendations for the Water Authority.

- Principal consultant for the Environmental Protection Agency Water System Improvements Asset Management, Sanitary Survey, and SCADA Project for the City of

Daniel P. Baker, P.E.

Surprise, Arizona. He led the evaluation of the existing asset management software, including Infor™ Hansen and ESRI ArcGIS, and made recommendations for system improvements and data integration to support best management practices for water and wastewater assets. He is currently assisting in the first phase of implementation of the system improvements.

→ Project manager for the Enterprise Resource Planning (ERP) System Requirements Definition, Software Selection, and Implementation for the Elsinore Valley Municipal Water District, California. He managed the requirements definition, business process analysis, procurement, and program management for replacement of the District's financial, human resources/payroll, customer service, and utility billing systems. He assisted in the ERP implementation of project/grants management and capital/operations and maintenance budgeting modules.

→ Project manager for the Asset Management Plan Project for the Yorba Linda Water District, California. He was responsible for development of the overall asset management program for the District's complete water and sewer assets. The project included complete asset inventory, condition assessment of aboveground assets, GIS-based analyses of belowground assets, risk assessments for probability and consequence of failure, rehabilitation and replacement (R&R) program development, and funding analyses.

→ Project manager and principal consultant for the Asset Management and GIS Upgrade Project for the Anchorage Water and Wastewater Utility, Alaska. He was responsible for defining requirements for the upgrade and integration of the geographic information system (GIS) and Maximo® CMMS including the development of best practices for asset management as related to utility-wide information systems and business processes. He led the development of as-is and to-be business processes for the entire asset life-cycle from planning and budgeting, through construction, operations and maintenance, and asset retirement.

→ Principal consultant for the Asset Management Program for the City of Scottsdale, Arizona. He assisted with the assessment of linear, belowground assets for the City's water and wastewater facilities. His responsibilities included the planning and design of an asset management system, integrated with the City's existing CMMS, GIS, and financial and dashboard reporting systems to support the identification, prioritization, and planning for the renewal and replacement and Capital Improvement Program (CIP) projects.

→ Lead consultant and technical advisor for the Repair and Replacement (R&R) Program Pilot Project for Tampa Bay Water, Florida. He led the development of a pilot project for Tampa Bay Water's R&R Program including vision and strategy, asset condition and risk assessment, and (CIP) development for a well field and water treatment facility. The project included development of a plan for a full-scale implementation program and requirements definition for a customized Enterprise Maintenance Management System (EMMS) to support the R&R program.

→ Program management systems lead for City of Austin, Texas, Water and Wastewater Annexation Program and city-wide CIP management system implementation for over \$1 billion in annual capital projects.

→ Project manager for the Granite XP Upgrade and Implementation Support Project for the North Tahoe Public Utilities District, California. He conducted an evaluation of the District's software, processes, and organization involved in the inspection of sewer mains, manholes, and laterals. He implemented upgrades to the CUES Granite XP closed-circuit television (CCTV) inspection software and made recommendations regarding use of the NASSCO Pipeline Assessment & Certification Program (PACP) for standardized condition assessment of the sewer system.



Riley C. Powers

Riley Powers joined Carollo during the summer of 2017 as a Geographic Information Systems (GIS) Analyst after graduating from Northern Michigan University. Prior to joining Carollo, he worked in water and wastewater infrastructure mapping with the City of Marquette, Michigan, Engineering Department. His skills focus on the collection and manipulation of data, creation and maintenance of geodatabases, conversion between program interfaces and data types for map creation, spatial analysis, and creation of cartographic figures.

Education

BS Environmental Studies, Northern Michigan University, 2017

Certifications

Geographic Information Systems, Northern Michigan University

Relevant Experience

→ GIS Analyst for the City of Reno, Nevada, Northwest Reno Sewer Capacity Analysis and Master Plan. Carollo conducted a sanitary sewer capacity analysis and developed a master plan for the City's Northwest area. Collected and reviewed existing data, ran analysis on data for modeling purposes, and created cartographic figures of the collection system and capital improvement projects for use in the Master Plan report.

→ GIS analyst for the City of Morro Bay, California, OneWater Water and Wastewater Master Plan. Riley aided in the addition of important invert elevation data in areas with data gaps so a model could be generated. Along with maintenance of Morro Bay's database, Riley created cartographic figures for display of pipeline and facility alternatives.

→ GIS analyst for the City of Tumwater, Oregon, Comprehensive Water System Plan Update. To assist with the RUL analysis of the current Tumwater Water Pipe Network, Riley updated the pipe network with pipe installation years along with their material with information provided by the City. The updated pipe information was used for creation of cartographic figures showing the updates, which were then sent to the City for verification. This information was used to determine the remaining life of the current pipes and to help determine what would need to be updated by Tumwater's Comprehensive Water System Plan.

→ GIS analyst for the City of Ukiah, California, Phase 1 and 2 Water Pipeline Final Design. To assist in the determination of irrigable acreage along the proposed water pipeline alignment, Riley recalculated the acreage based on new data provided by the City and crop type changes to parcels

along the proposed alignment. The updated acreages and irrigation types were used to determine the overall demand by the current and new customers. The updated information was also used to create a cartographic figure displaying the ownership of each parcel and its irrigation type along the proposed alignments.

→ GIS analyst for the City of Lemoore, California, Water, Sewer, and Wastewater Treatment Plant Master Plans. To help the city fill gaps in its wastewater network pertaining to elevation data and determine flow monitoring locations, Riley located and entered important elevation data and created cartographic figures for verification of flow monitoring locations.

→ GIS analyst for the Clackamas River Water District, Oregon. To help the client determine its existing service area, urban growth boundary, and planning area for current water customers, Riley developed cartographic figures in cooperation with key Clackamas County professionals. Figures were developed and refined to determine accurate boundaries. Along with the creation of cartographic figures, Riley performed data alterations and joins based on the locations of features, and data needs for modeling and accurate analysis of the overall system requirements.

→ GIS analyst for the City of Renton, Washington, Water System Master Plan Update. Riley created a cartographic figure showing the City's overall system, its pressure zones, and potential annexation zones to help Carollo's project engineers get an overall understanding of the system and key areas in a spatial setting.

→ GIS analyst for the Dallas Water Utilities, Texas, White Rock Creek Ash Creek Line. To help the client determine a feasible

Riley C. Powers

alternative for its water network, Riley created cartographic figures showing proposed alignments, along with important attributed information to help the client understand the proposed updates and alternatives moving forward.

→ GIS analyst for the City of Shelton, Washington, Water System Comprehensive Plan Update. Riley created an overall system map for City confirmation of pipe diameters throughout its water network.

→ GIS analyst for the Soquel Creek Water District, California, Groundwater Replenishment Recycled Water Feasibility Study. To aid in development of cartographic figures, Riley created data relating to the locations of important water purification facilities, based on previous documents, and their relation to the region's water districts and recharge wells. He also created cartographic figures of the potential Pure Water Soquel pipeline alternatives.

→ GIS analyst for the City of Porterville, California, Integrated Master Plan. Riley created cartographic figures showing the surrounding irrigations districts in proximity to the City of Porterville and how they intersect.

→ GIS analyst for the City of Riverside, California, Integrated Wastewater and Treatment Facilities Master Plan. Riley provided cartographic figures showing the collection service area, study area, overall topography, existing and buildout land use, temporary flow monitoring program, and rain gauge locations. He also provided technical support through manipulation of data for use in modeling.

→ GIS analyst for the Santa Cruz County Sanitation District, California, Phase 1 Inflow/Infiltration Mitigation Program. Riley is creating cartographic figures for the overall system and flow monitoring locations for overview and verification by the District.

→ GIS analyst for the City of Tacoma, Washington, Downtown Wastewater Model. To aid in the development of the downtown wastewater model, Riley performed various

joins based on spatial location, along with geocoding addresses and other important information to be included in parcel shapefiles. These layers, created and altered by Riley, went into the creation of figures showing important project locations, noted roof drainage areas, vacant and historical parcel locations, missing invert and rim elevations, basins, and zoning and land use.

→ GIS analyst for the City of Banning, California, Capital Improvement Plan. To help the City anticipate existing and future deficiencies and how they will be resolved, Riley developed figures showing overall systems, locations of capital improvement projects, scheduled phasing of pipeline updates, and locations of important facilities.

→ GIS analyst for the Contra Costa County Sanitary District, California. To assist the project manager and graphics design department, Riley developed an overall system map with locations of key facilities, pipe information, and city boundaries to show the distribution of the District's sanitary sewer network.



Education

BS Civil Engineering,
California State
University, Fresno, 2006

Licenses

Civil Engineer, Nevada,
California

Professional Affiliations

American Water Works
Association

California Water
Environment Association
- Central San Joaquin
Section

Ryan F. Orgill, P.E.

Ryan Orgill joined Carollo in 2005 and has experience in master planning, hydraulic modeling, sewer system management planning, urban water management planning, and geographic information systems (GIS).

Relevant Experience

→ Project Engineer for the City of Morro Bay, California, OneWater Morro Bay Plan. Responsible for overseeing the development of hydraulic models of the water distribution, sewer collection, and storm drainage systems. Improvement projects and a capital improvement plan were developed to mitigate capacity deficiencies.

→ Project manager for the City of Reno, Nevada, Northwest Reno Sewer Capacity Analysis and Master Plan. The City retained Carollo to conduct a sanitary sewer capacity analysis and develop a master plan for the City's Northwest area. Carollo collected and reviewed existing data; conducted site visits to gather additional information on the City's collection system; and interviewed staff to develop a better understanding of suspected operations and maintenance issues, flow diversions, and other collection system hydraulic information. The team developed a temporary flow monitoring program; reviewed the City's existing SewerGEMS model to expand the existing wastewater collection system hydraulic computer model, including nine major trunk lines; calibrated the model using flow monitoring data; reviewed planning documents to determine existing and build-out wastewater flow projections; modeled existing and future system capacity evaluations; and developed prioritized, recommended capacity projects based on deficiencies.

→ Hydraulic modeling support for the City of Tulare, California, J Street and Alpine Vista Water Storage Tank Improvements. The project involved planning, preliminary and final design, and engineering services during construction of two 2-MG concrete storage tanks and two wells. The storage tanks are designed to supply the flow needed between the peak day and peak hour demand to mitigate low pressure issues.

→ Hydraulic modeling lead on the City of West Sacramento, California, Water System

Master Plan Update. Responsible for development and calibration of a water system hydraulic model, system evaluation under existing and year 2035 demand conditions, and development of a staged capital improvement plan for the City.

→ Project engineer for the City of Shasta Lake, California, 2016-2026 Water Master Plan. Responsible for hydraulic model development and calibration using InfoWater modeling software, and capacity evaluation of the distribution system.

→ Hydraulic modeling lead for the City of Santa Barbara, California Water Model Update. Responsible for update and calibration of the City's water system hydraulic model using the InfoWater modeling software application, development of a system specific diurnal pattern for the City, and custom hydraulic model training for City staff.

→ Staff engineer for the Port of Oakland, California, Port-Wide Sewer System Management Plan, which was prepared to meet the requirements of both the State and the Regional Water Quality Control Boards. As part of the project, responsibilities included development of several supporting documents specific to the Port. These include a System Evaluation and Capacity Assurance Plan (SECAP), sanitary sewer design and construction standards, sanitary sewer use ordinances, an overflow emergency response plan, and a fats, oils, and grease control plan. The SECAP included development and calibration of a fully dynamic hydraulic model of the sewer collection system calibrated to both dry weather and wet weather conditions, evaluation of the collection system for existing and future design flow conditions, recommendations for capital improvements to mitigate deficiencies, condition assessment of sanitary sewer facilities in the Port, and development of costs associated with the proposed capital improvements.

Ryan F. Orgill, P.E.

- Project engineer for the City of Cotati, California, Sewer and Water System Master Plans. Responsible for hydraulic model development and calibration, existing and build out analysis of the water and sewer systems, development of capital improvements to mitigate existing deficiencies and to service future growth, development of a staged capital improvement plan, and development of the final Sewer and Water System Master Plan reports.
- Project engineer for the City of Tulare, California, Water System Master Plan. Responsible for hydraulic model creation and calibration, development of analysis criteria, evaluation of the City's existing water system, development of improvement projects to mitigate existing deficiencies and to serve future growth, and development of a staged capital improvement plan.
- Staff engineer for the Los Angeles International Airport (LAX) Phase I fire flow analysis for the Central Terminal Area (CTA) of LAX, California. Responsible for development and calibration of a hydraulic computer model of the CTA water distribution system, development of evaluation criteria, and fire flow analysis of the CTA distribution system. The model calibration consisted of both an extended period simulation and a fire flow calibration of the CTA system. The fire flow analysis of the CTA distribution system involved evaluation of a number of potential alternatives to increase the available fire flow at various areas in the CTA distribution system.
- Staff engineer for the Victorville Water District, California, 20-Year Comprehensive Water Master Plan. Responsible for calibration of the District's ID2 water distribution system hydraulic model, evaluation of the ID2 water system, and development of improvement projects to mitigate existing deficiencies and accommodate future growth.
- Distribution system modeling for the City of Sanger, California, Water Storage Tank Project. The project includes design and engineering services during construction of a 750,000-gallon tank, booster pump station, blending station, and small diameter pipeline from an existing well site to the new tank site. The project cost is \$3.5 million. The design will be completed in September 2018 and construction will be completed in September 2019.
- Staff engineer for the City of Galt, California, Water System Master Plan. Assisted in the preparation of the City's Master Plan report and development of a staged capital improvement plan.
- Staff engineer for the City of Hughson, California, Water System Master Plan. Assisted in the preparation of the City's Master Plan report and development of a staged capital improvement plan.
- Project engineer for the City of Hanford, California, Great Valley Ethanol Plant Special Study and Water Supply Assessment. Responsible for completion of a water supply assessment for the proposed Great Valley Ethanol Plant and evaluation of the effect of the proposed project on the City's industrial park water system.
- Project engineer for the City of Hanford, California, GWF Power Systems Special Study. Responsible for completion of an evaluation of the effect of the proposed GWF Power Systems expansion on the City's industrial park water system.
- Project engineer for the City of Turlock, California, Sanitary Sewer and Storm Water Master Plans. Responsible for overseeing the construction of the City's sewer and storm drainage system hydraulic models.
- Project engineer for the City of Cotati, California, Sewer and Water System Master Plans. Responsible for hydraulic model development and calibration, existing and build out analysis of the water and sewer systems, development of capital improvements to mitigate existing deficiencies and to service future growth, development of a staged capital improvement plan, and development of the final Sewer and Water System Master Plan reports.



Kirsten M. Burns, E.I.

Kirsten Burns has four years of experience, which includes master planning, hydraulic modeling, and distribution/collection systems flushing techniques. Her primary focus includes hydraulic model development, integrated with GIS, where she has developed new or updated existing hydraulic models, including providing system calibration and model training.

Education

BS Environmental Engineering, University of Central Florida, 2015

Licenses

Engineer Intern, Florida

Professional Affiliations

American Water Works Association

Florida Water Environment Association

Relevant Experience

→ Intern engineer for the Orange County, Florida, Stormwater Inventory Project. Responsible for consolidation of stormwater inventory information in GIS including pump station and drainwell information for Orange County.

→ Intern engineer for the Orange County, Florida, Pond Mowing Study. Responsible for consolidation of pond information for Orange County contracted and non-contracted ponds with intent of producing mowing limits in GIS for maintenance of ponds.

→ Project engineer for the City of Daytona Beach, Florida, Wastewater Master Plan. Responsible for development and calibration of the hydraulic model to assist the City in planning for future development and capital improvement projects. Tasks include data collection; population, flow and diurnal pattern analysis; field testing; assessment of key infrastructure; model development; calibration for dry and wet weather scenarios; and overall system analysis for existing and future conditions.

→ Project engineer for the Pasco County Utilities, Florida, Calibrated Wastewater Hydraulic Model. Responsible for development of a calibrated wastewater hydraulic model for Pasco County Utilities wastewater collection system, which includes over 600 publicly owned pump stations and extensive gravity sewer system connected to six active treatment plants. Tasks included on-site data collection; population, flow and diurnal pattern analysis; field testing; model development; calibration for dry and wet weather scenarios; and overall system analysis.

→ Project engineer for the City of Orlando, Florida, Eastern Regional Reclaimed Water Distribution System (ERRWDS) Narcoossee Road Reclaimed Water Model. Responsible for development of hydraulic model and

analysis of reclaimed water system to determine necessary upsizing and improvements along Narcoossee Road. Tasks included development of reclaimed water demands using customer billing data for existing demands and applying Traffic Analysis Zone growth projections to develop future demands. Model updates and improvements were completed and hydraulic analysis of existing piping to determine necessary upsizing.

→ Project engineer for the City of Orlando, Florida, Eastern Regional Reclaimed Water Distribution System (ERRWDS) Water Model (Phase 2). Responsible for calibration of the reclaimed water hydraulic model and analysis of the existing and future conditions to determine necessary improvements through the year 2045. Improvements included locating and sizing a remote storage and re-pump facility and piping improvements to remove existing hydraulic limitations and improve overall system performance with a focus on low pressure issues during peak demand periods.

→ Project engineer for the Orange County Utilities, Florida, Meadow Woods Reclaimed Water Model Calibration and Alternatives Analysis. Responsible for hydraulic model updates and calibration, development of existing and five-year future demands for analysis of operation improvements for a remote storage and re-pump facility to optimize scheduled filling and draining to meeting local demands and address pressure issues to customers during peak demand periods.

→ Project engineer for the City of Orlando, Florida, Raleigh Street Sewer Improvements Preliminary Design. Responsible for the development of a hydraulic model in In-foSWMM and analysis of an existing gravity sewer system to determine necessary upsizing and improvements.

Kirsten M. Burns, E.I.

→ Project engineer for the City of St. Petersburg, Florida, Storage Reduction Evaluation Hydraulic Modeling and Unidirectional Flushing Program Design. Responsible for hydraulic model analysis for the reduction of oversized and parallel water mains as a method of reducing water main storage and therefore reducing high flushing requirements and water quality issues including nitrification. A unidirectional flushing program in the South Service Area was designed and implemented to reduce flushing requirements, improve water quality and defer upcoming CIP expenditures by scouring mains at high velocities through an effective flushing plan.

→ Project engineer for the Seminole County, Florida, Southwest Service Area & Remaining Enclave Areas Unidirectional Flushing Program Design. Responsible for hydraulic modeling and design of a unidirectional flushing (UDF) program for Seminole County's Southwest Service Area (SWSA) and additional enclave service areas focusing on an efficient and effective flushing regime to clean county's SWSA and the additional enclaves service areas distribution systems piping while conserving water, improving water quality, and deferring upcoming CIP expenditures.

→ Project engineer for the City of St. Petersburg, Florida, Wastewater Hydraulic Modeling Assessment. Responsible for performing an independent assessment of the wastewater hydraulic model in Innowyze's InfoWorks ICM SE software related to its validity and functionality, including current operational practices by the water resources department who maintains, updates and utilizes the wastewater hydraulic model. The model was assessed for its ability to support capacity evaluations and the development of a Wet Weather Overflow Mitigation Program as well as to prioritize repair and replacement issues for the wastewater transmission and collection system.

→ Project engineer for the Brevard County, Florida, West Cocoa Transmission Planning. Responsible for developing a hydraulic model in Innowyze's InfoSWMM software for the West Cocoa wastewater transmission

system prior to the design of required improvements. The purpose of developing a hydraulic model was to computer-simulate scenarios within the West Cocoa wastewater transmission system such that the interaction between lift stations could be determined, and an optimized system solution could be established; the resulting selected scenario was then be utilized to develop a scope for the design of improvements in a more cost-effective manner.

→ Project engineer for the City of Port St. Lucie, Florida, Hydraulic Model Conversion. Responsible for conversion of the water, wastewater and reclaimed water hydraulic models from Bentley's WaterCAD software to Innowyze's H2OMap software to support City staff with planning of capital improvement projects, design, operations, regulatory compliance and optimization of services to their existing customers.

→ Project engineer for the Orange County Utilities, Florida, Eastern Water Reclamation Facility (EWRF), Facilities Planning Project. Responsible for the development of an asset management program for the EWRF, including development of an assessment criteria, asset inventory, condition assessment, risk evaluation, and prioritization of rehabilitation and replacement needs.

→ Project engineer for the City of St. Petersburg, Florida, Maximo Area Flow Monitoring, Metering and Analysis Study. Responsible for flow data compilation and analysis at three sites equipped with Hach flow monitoring units for approximately three months. The data was compiled and utilized in a pilot infiltration and inflow study.

→ Project engineer for the City of Sanford, Florida, Unidirectional Flushing Program Update. Responsible for updating the unidirectional flushing model and program implementation materials to include new developments and operational changes. Recommendations were made for prioritizing flush zones based on provided water quality data.



Kunal Nayee, P.E.

Kunal Nayee has six years of experience in the water utility field. While in college, he studied environmental engineering with a focus on water/wastewater treatment and hydraulic engineering. Mr. Nayee's consulting experience ranges from GIS, permit writing, potable design, gravity design and data acquisition. His focus is working with municipalities on asset management studies as well as utility design. Mr. Nayee's projects include hydraulic modeling for city- and county-level systems, asset management studies, and potable water system designs. Mr. Nayee's project experience includes playing a central role in hydraulic water and wastewater models for a city-level system, asset management plan using GIS techniques for criticality modeling for a county-level forcemain system, and a potable water system replacement design for a city CIP. Along with hydraulic modeling and asset management, Mr. Nayee has worked extensively on permit writing and application preparation for utilities and private clients.

Education

M.S., Water Resources Engineering, University of Central Florida, 2016

B.S., Environmental Engineering, University of Central Florida, 2012

Licenses

Professional Engineer, Florida

Professional Affiliations

Florida Water Environment Association
- Member

American Water Works Association, Florida Section Region III Chair

Relevant Experience

→ Project engineer for the Indian River County Wastewater Hydraulic Model Update, Indian River County, Florida. Converted existing GIS information from the County into WaterCAD for use in a hydraulic model. Data aggregation of the SCADA from all of the County owned lift stations was also organized and incorporated into the model of analysis. The project was completed in 2015.

→ Project engineer for the City of Coconut Creek Water/Wastewater/Stormwater Utilities Master Plan, Coconut Creek, Florida. The project included a master plan for the City of Coconut Creek utilizing existing City data and external sources. Created the wastewater hydraulic model and determined CIP's for the City on a 5 year basis starting from 2015 to 2030. Pressure recording of the distribution system was conducted in field to collect calibration information onsite. Aided in the analysis of the water model created for the City and the water quality analysis. An existing asset management system created in house by Mr. Nayee and the Water Infrastructure group customized to the City's GIS system and ran to determine areas of the distribution system that require maintenance. Capacity, Management, Operation and Maintenance (CMOM) were all taken into account when analyzing the City's existing and proposed systems. With the aid of the hydraulic model and the asset management system prevention of sanitary sewer overflows was achieved by determining locations where pipes were undersized or in

need of maintenance. Listing out the improvement projects based on CIP years was also a goal for the study. In addition to overflows and CIP management alternate collection flow scenarios were investigated to allow the City to redirect the wastewater flow in a varying number of scenarios. Also reviewed the City's existing GIS schema and layering and recommended changes based on the Esri standard practices. The project was completed in 2016.

→ Project engineer for the Pembroke to Hollywood Blvd Water Main Replacement Program, Hollywood, Florida. Aided in the creating on the contract documents related to approximately 59,000 LF of water main as part of a replacement program. The size of pipe ranged from 4-inch to 12-inch within a heavily congested portion of Hollywood. Additional support was provided for GIS layer creation of the site for use in layout maps, water meter schedules for the contract documents and field investigations and data aggregation of related information. The project was completed in 2017.

→ Project engineer for the Mims Water System Pipeline Replacement, Brevard County, Florida. Supported GIS data creation from existing CAD layers, partial clearance permitting, and other design support roles. This work supports efforts to update and finalize the pipeline design, including revisions based on site changes occurring since previous design and completion of bidding and construction services. Services also include completing and resubmitting

Kunal Nayee, P.E.

expired project permits. The project was completed in 2015.

→ Project engineer for the Force Main and Gravity Sewer System Condition Assessment and Rehabilitation Plan Development, Seminole County, Florida. Supporting this assessment and development of a rehabilitation plan specific to Seminole County Environmental Services Department below ground infrastructure needs for force mains, air release valves, gravity sewers, and manholes. Created forcemain criticality geoprocessing model to access assets using an ArcGIS interface. The project was completed in 2015.

→ Project engineer for the Evaluations and Calculations for Force Main Upsizing, City of Winter Haven, Florida. Supported the evaluation of force main upsizing to improve wastewater system flows generated by approximately 21 lift stations that discharge flow through an existing force main along SR 452. Major tasks included GIS data creation, wastewater flow mapping, and assistance with development of final design report. The project was completed in 2015.

→ Engineer for the Taft and Sheridan Street Water Improvements, City of Hollywood, Florida. Provided engineering and design support services for water line replacement in the City of Hollywood between Taft and Sheridan Street. Including GIS digitization, shop drawing review and in field inspections. The project was completed in 2015.

→ Project engineer for the Black Mountain Ranch Hydraulic Modeling, San Diego, California. Created a potable water hydraulic model for a new development within the City of Chula Vista city limits. The hydraulic model allowed for proper sizing of the water mains that will serve the property as well as the internal piping to serve each of the individual properties. The project was completed in 2016.

→ Project engineer for the ECDD Water, Wastewater and Reclaimed Water Hydraulic Model, Celebration, Florida. Created the water and reclaimed hydraulic model for use in a master plan for the Celebration development located in Central Florida. Data provided by the client was aggregated and incorporated into the models. Analysis was

conducted on the sizing, pipe routing and capability of the systems to supply potable/reclaimed and remove wastewater from the system during peak usage while maintaining minimum velocities in the system. Recommendations were then determined based on the model results and CIP's listed. The project was completed in 2015.

→ Engineer for the High Desert Water District Wastewater Collection System Program, High Desert Water District Yucca Valley, California. Project consisted of a septic to sewer program for approximately 25,000 residents and business. The project contains over 77 miles of pipelines (sewer mains, truck sewers and force mains) and three lift stations. The 2017 project will be constructed in three phases. Modeling in In-foSWMM was conducted on Phase 1 and 2 to confirm pipe sizes and pumping capabilities.

→ Engineer for the Triton Mayport Hanger Extension, Naval Facilities Engineering Command. Project included construction of a new hanger bay adjacent supporting facilities which includes two-bay aircraft operation and maintenance hangar. Potable utilities were modeled in WaterGems and the subsequent sizing and route was designed in AutoCAD Civil 3D. The project was a 2017 design build project with heavy involvement from the contractor.

→ Engineer for the MCO South Terminal C Phase 1, Greater Orlando Aviation Authority, Florida. Provided engineering support for the landside utilities, which included hydraulic modeling of the proposed site. Work also included field verifying hydrants flow rates.

→ Project engineer for the Disney Master Utility Plan, Western Way Expansion, RCES, Winter Garden, Florida. Created water and reclaimed water hydraulic model for a residential and commercial expansion. Analyzed the future growth and potential worst case scenario for two utilities owning and operating two separate portions of the distribution mains to serve the expansion. Fire flow scenarios were ran for each of the short and long term scenarios to ensure coverage during all times.



Ryan M. Hejka, E.I.T.

Ryan Hejka is a civil engineer with six years of professional experience. He is specialized in water and recycled water system hydraulic modeling and master planning projects and is skilled in the use of a wide variety of hydraulic modeling packages including InfoWater, H₂OMAP, Mike Urban, and Water GEMs. In addition, he has extensive experience with ArcGIS and proficient in multiple programming languages that he utilized to build several customized water optimization models and tools for water agencies. His experience includes:

Education

BS Civil Engineering,
California State
Polytechnic University,
Pomona, 2012

Licenses

Engineer-in-Training,
California

Professional Affiliations

American Society of Civil
Engineers

California Water
Environment Association

Relevant Experience

→ Staff engineer for the Nitrification Study for Mesa Water District, California. This project involved extensive field data gathering and analysis to identify trends and solutions for nitrification events. He was responsible for the hydraulic modeling analysis that was conducted to identify potential hydraulic contributing factors, such as water age and system operations. Alternative operations were evaluated to determine the impact of hydraulics changes. Recommendations were included in the nitrification mitigation and prevention plan.

→ Staff engineer/water system planner for the 2014 Water Master Plan Update for Mesa Water District, California. He was responsible for coordinating data gathering, designing the custom water supply and demand optimization model (WSDOM) in Microsoft® Excel, supply analysis, and preparing the report. This project involved demand projections, water supply analysis, hydraulic model update and calibration, extensive field condition assessment, and development of an optimization model. As part of the field condition assessment, all water system facilities (8 groundwater wells, 1 treatment plant, 2 reservoirs, 2 booster stations, and imported water connections) were visited. In addition, 2 miles of non-destructive pipeline testing was done. The findings of the modeling and condition assessment analysis were combined into a comprehensive CIP and water master plan report.

→ Staff engineer for system-wide hydraulic model development for the Metropolitan Water District of Southern California. As subconsultant to DHI, Carollo assisted in the development, calibration, and validation of four separate hydraulic models that collec-

tively cover Metropolitan's entire conveyance system. The models were developed from existing GIS data in Mike Urban modeling software. Ryan assisted in the model development, model calibration, model validation, and model development documentation.

→ Task engineer for the Mass Balance Model for the One Water LA 2040 Plan, California. This project looks at the integration of all of the City's water assets. He was responsible for the development of a custom mass balance planning model that tracks all major flows in the City of Los Angeles in annual time steps from 2015 through 2020 under normal, wet, and dry year conditions. The modeled flow components include imported water, groundwater, wastewater, recycled water, stormwater, and discharges to the LA River and ocean. This model also includes a cost module and will be utilized in the alternatives analysis of the One Water LA 2040 Plan.

→ Staff engineer for the Water and Recycled Water Master plan for UC Irvine, California. The project includes the creation of water system and recycled water system models from AutoCAD maps, 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. He was responsible for the model network creation from UCI's water system maps in AutoCAD, as well as the preparation of the model calibration plan.

→ Staff engineer/modeler for the existing and future system supply and storage study for the Greenbelt pipeline system. The Greenbelt pipeline system is a main recycled water supply line of the Los Angeles/Glen-dale Water Reclamation Facility.

Ryan M. Hejka, E.I.T.

→ Staff engineer/modeler for the water and fire water system analysis for the Utilities Infrastructure (UIP) master plan for LAX. The UIP included analyzing future water demand projections based on passenger counts. As part of this effort, As-Builts were utilized to update the existing LAX hydraulic model. Alternatives were then developed in the model to analyze existing and future water and fire water system deficiencies. Improvement projects were then prioritized into a phased capital improvement program (CIP) within the UIP.

→ Project engineer for the on-call hydraulic modeling for the City of South Pasadena, California. The project consisted of various hydraulic modeling evaluations to the hydraulic impact and new water system infrastructure requirements when new developers are connected to the existing distribution system. The model that was developed and calibrated during a previous project was utilized for these studies.

→ Staff engineer for the 2016 Water Master Plan for the City of Colton, California. This project included water demand forecasting, hydraulic model development and EPS calibration using field fire flow testing. Existing and future system analysis was conducted to develop a CIP including a rehabilitation and replacement program. The findings were presented in a comprehensive water master plan report that was developed in conjunction with the 2016 Sewer Master Plan.

→ Staff engineer for the 2015 Water Master Plan for the City of Oxnard, California. This project included water demand forecasting, hydraulic modeling analysis using WaterGEMS, existing and future system analysis, development of a capital improvement program (CIP) including a rehabilitation and replacement program. The findings were presented in a comprehensive water master plan report that was part of the overall Integrated Master Plan.

→ Staff engineer/modeler for the Metropolitan Water District hydraulic model development and calibration. He was part of a team responsible for building the District's hydraulic model from existing GIS data. He

also assisted in the calibration of the model using historic data, as well as the calibration the model to utilize active controls.

→ Staff engineer/modeler for the 2015 Comprehensive Facilities Master Plan for Padre Dam Municipal Water District, California. The project included (recycled) water demand/sewer flows forecasting, water supply analysis, hydraulic model updates for the water and recycled water systems, development and calibration of a new sewer system model, and field condition assessment of key findings. He was responsible for the modeling of the existing and future infrastructure. The feasibility of the wastewater plant expansion for an IPR project was also evaluated. The findings were combined into a comprehensive CIP and water master plan report.

→ Staff engineer/modeler for the on-call hydraulic modeling services for the expansion of the Los Angeles International Airport (LAX), California. Various fire flow scenarios were analyzed using the InfoWater hydraulic model developed by Carollo. He was responsible for updating the hydraulic model with their current facilities, hydraulic model analysis of pipeline velocities and residual fire flow pressures, and providing future infrastructure recommendations. The modeling results were used to advise the design team on layout and sizing of pipelines, valve configuration, and residual pressure.

→ Staff engineer/modeler for the 2015 Integrated Water, Wastewater, and Recycled Water Master Plans for the City of Oceanside, California. He was responsible for coordinating data gathering, supply analysis, and preparing the report on this \$1.2 million assignment. The project involved 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.

→ Staff engineer for the 2013 Integrated Water Master Plan for the City of Riverside, California. He was responsible for identifying potential stormwater recharge sites, sizing detention basins, sizing recharge site infrastructure, and preparing the report.

Appendix B: Professional Services Agreement Acceptance Form

Firm Name: Carollo Engineers, Inc.

Address: 3150 Bristol Street, Suite 500

City Costa Mesa State CA Zip Code 92626

Telephone: 714-593-5100 Fax: 714-593-5101

I have reviewed the RFP and Professional Services Agreement in their entirety. Our firm will execute the Professional Services Agreement with no exceptions.

Name of Authorized Representative: Graham J.G. Juby, PhD, PE, Vice President

Signature of Authorized Representative: 

Date: August 22, 2019



*Dedicated to
Satisfying our Community's
Water Needs*

MEMORANDUM

TO: Board of Directors
FROM: Denise Garcia, Administrative Services Manager
DATE: October 10, 2019
SUBJECT: Information Technology Support Services

RECOMMENDATION

Award a contract to T2 Tech Group, LLC in the amount of \$480,000 per year for five years with 2-one year renewal options to provide Information Technology Support Services.

The Finance Committee reviewed this item at its September 23, 2019 meeting and recommends Board approval.

STRATEGIC PLAN

Goal #2: Practice perpetual infrastructure renewal and improvement.

Goal #3: Be financially responsible and transparent.

Goal #6: Provide outstanding customer service.

PRIOR BOAD ACTION/DISCUSSION

At its August 8, 2013 meeting, the Board of Directors (Board) awarded a contract to T2 Tech Group, LLC (T2) in the amount of \$80,000 for the Information Technology (IT) Program Assessment and authorized the General Manager to execute the contract.

At its January 9, 2014 meeting, the Board approved a change order with T2 for the IT Assessment for an amount not to exceed \$7,000 and authorized the General Manager to execute the change order.

At its May 22, 2014 meeting, the Board authorized \$1,275,000 for the the IT Implementation Plan and approved T2 to provide the architecture, design, and project coordination services to re-engineer the IT Operations Model.

At its September 11, 2014 meeting, the Board awarded a contract to T2 for an amount not to exceed \$30,000 for a Citrix Environment Remediation Project and authorized the General Manager to sign the contract.

At its December 14, 2017 meeting, the Board approved \$479,553 for Phase 2 of the IT Master Plan Project and authorized staff to work with T2 to provide design, implementation, and project coordination services.

BACKGROUND

In 2013, after conducting a competitive selection process, the Board awarded a contract to T2 to conduct an IT program assessment. The assessment evaluated Mesa Water District's (Mesa Water®) IT business strategy, system operations, infrastructure, applications, organization, and resources to identify areas of improvement. T2 recommended developing an IT Master Plan to improve Mesa Water's IT infrastructure.



In 2014, the Board approved the IT Implementation Plan (IT Master Plan) and approved T2 to provide architecture, design, and project coordination services to re-engineer the IT Operations Model.

The IT Master Plan Project was completed over the past five years and included the following priorities:

Priority 1 has been completed and included the ability to recover data in the event of loss and to improve visibility of the IT systems. Data recovery included the development of architecture, design, and plans to implement an enterprise backup environment; and implemented unified backup systems configured to backup both virtual and physical environments. Improving visibility for data recovery included developing, documenting, and publishing the following:

- Monitoring procedures to validate executed backup jobs;
- Creating processes for failed backup jobs to avoid data loss and ensure data protection;
- Testing data recovery processes across all platforms; and,
- Developing a plan to confirm valid recovery of key Mesa Water systems and data from backups.

Priority 2 has been completed and consisted of closing security gaps by developing security architecture for hardware and software that could be managed, monitored, and redundant. Additionally, closing security gaps included policy control for restricting access to critical servers and ensuring proper configuration of firewall servers.

Priority 3 has been completed and involved the reduction of capacity gaps. Implementing a reduction of capacity gaps included developing architecture, design, and a plan to implement an enterprise storage environment. With this environment in place, Mesa Water was able to identify and document a business continuity plan in the event of a catastrophic failure or failover to accommodate maintenance of primary storage. Configuration of secondary storage has been completed.

Priority 4 has been completed and consisted of replacing aging IT infrastructure. Prior to server replacement, a server architecture and topology diagrams that included all server names, locations, roles, and Internet Protocol configurations was created. With the diagrams established, implementation of a server architecture design to govern the installation/configuration of new servers and changes to existing servers was utilized and standardized all servers. An establishment of standards development and management processes included the following:

- A configuration change management process;
- A design and standards review process; and,
- A standards exception approval process.

Priority 5 has been completed and encompassed the transition to an Industry Best Practices Operations Model. This priority began with the establishment of Service Level Agreements - key documents defining what provided IT services are expected and agreed



upon. Operation Metrics were implemented measuring three objectives: personnel workload and quality management, system monitoring and management, and incident management and root cause analysis. Layered on the Operational Processes and Metrics is a Continuous Quality Improvement Process that ensures quality improvement as processes and technology change over time.

In 2017, during the implementation of the IT Master Plan, a recommendation was made as part of the Business Improvement Process Implementation to outsource the District's IT Support Services.

On March 26, 2018, the Board approved the staffing plan for Fiscal Year 2019 which included the elimination of the two vacant full-time equivalent (FTE) budgeted IT employees. Based on their knowledge of the District's operations, T2 was selected to replace Mesa Water's two IT employees. The cost for IT Support Services was available based on the budgeted staffing costs totaling \$390,000 which consisted of the annual salary and benefits costs for the two FTE-budgeted IT employees.

DISCUSSION

T2 has been providing Mesa Water project and IT Support Services since 2013. To ensure the District is receiving the necessary IT Support Services at a reasonable cost to the public, Mesa Water developed a Request for Proposals (RFP).

Mesa Water solicited proposals from six qualified firms to provide IT Support Services. All six firms attended the pre-proposal meeting. Out of the six firms, three proposals were received. The proposals were reviewed by a Selection Panel comprised of Mesa Water staff. Each firm was evaluated based on qualifications, experience, staff availability, project understanding, scope of work approach, and proposal quality. The results were as follows:

Rank	Firm	Final Score	Information Technology Support Services Hourly Rate
1	T2 Tech Group, LLC	4.67	\$175-\$300
2	Noesis Group	3.00	\$98-\$125
3	California Computer Options	2.53	\$65-\$188

While all three firms provide a unique approach to the required scope of work and are well qualified to perform the work, T2 was unanimously ranked as the most qualified due to their experience and understanding of the District's operations. T2's proposal came in at \$480,000 per year with a five year total not to exceed \$2,600,000.

T2 has been providing IT Support Services to Mesa Water since 2013 including assessment of the District's previous program and implementation of the IT Master Plan. T2 is most familiar with the District's IT infrastructure, operational processes, and metrics. They understand the needs of Mesa Water, the Board of Directors, the management team and staff, and are very responsive when needed.



FINANCIAL IMPACT

In Fiscal Year 2020, \$561,000 is budgeted for Support Services; no funds have been spent to date.

ATTACHMENTS

None.



*Dedicated to
Satisfying our Community's
Water Needs*

MEMORANDUM

TO: Board of Directors
FROM: Phil Lauri, P.E., Assistant General Manager
DATE: October 10, 2019
SUBJECT: Replacement of Assets Including Pipeline and Well Rehabilitation

RECOMMENDATION

Adopt Resolution No. 1525 Regarding the Replacement of Assets including Pipeline and Well Rehabilitation Superseding Resolution No. 1442.

The Engineering and Operations Committee reviewed this item at its September 17, 2019 meeting and recommends Board approval.

STRATEGIC PLAN

Goal #1: Provide a safe, abundant, and reliable water supply.

Goal #2: Practice perpetual infrastructure renewal and improvement.

Goal #3: Be financially responsible and transparent.

PRIOR BOARD ACTION/DISCUSSION

At its June 5, 1980 meeting, the Board of Directors (Board) adopted Resolution No. 891 Governing Vehicle Replacement.

At its July 11, 2002 meeting, the Board adopted Resolution No.1268 Regarding the Replacement of Assets Superseding Resolution No. 891.

At its March 15, 2014 meeting, the Board adopted Resolution No.1442 Regarding the Replacement of Assets Including Pipeline and Well Rehabilitation Superseding Resolution No. 1268.

BACKGROUND

Replacement of Assets Policy Evolution

Since 1980, the Board has acknowledged the finite life of the District's assets. Beginning with Resolution No. 891, the Board set a vehicle and equipment replacement policy based on age and usage. This policy was enhanced by Resolution No. 1268 in 2002, which provided flexibility on replacing assets based on their performance, not just their age. As the Board became focused on aging infrastructure, a financial evaluation of age-based pipeline asset replacement was performed as part of the 2014 Water Systems Master Plan Update. This evaluation used industry-average useful life estimates for pipeline materials which ranged from 65 to 85 years. The resulting pipeline replacement cost curve (Figure 1) showed all 317 miles of pipeline requiring replacement in the next 100 years for an approximate total of \$552M (in 2013 dollars).

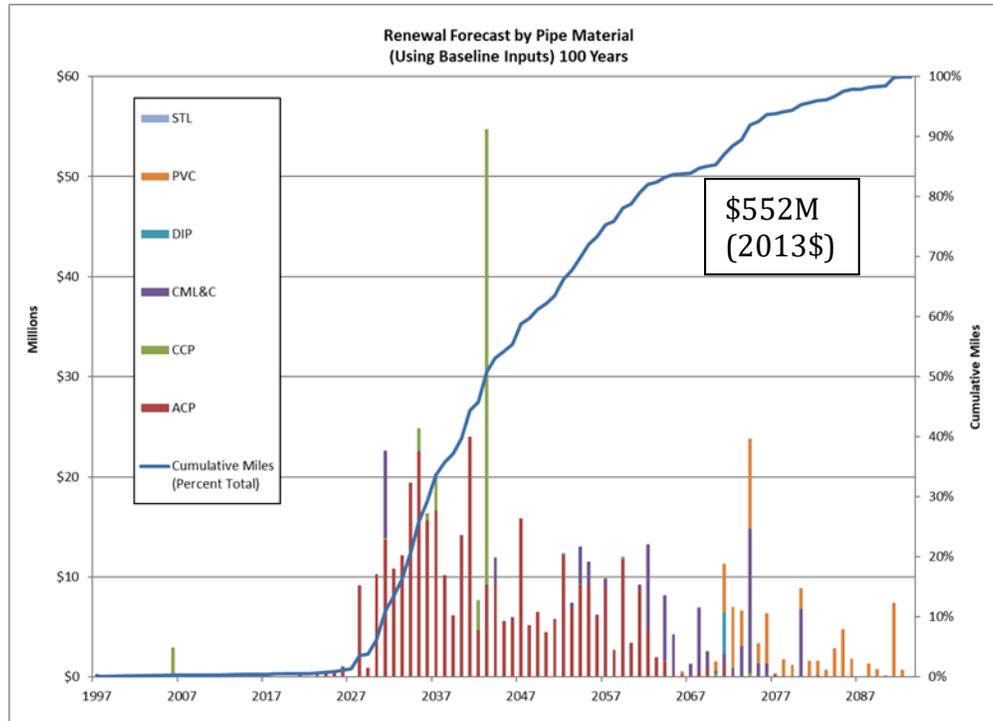


Figure 1. 100-Year Age-Based Pipeline Replacement Curve, 2013.

More than half of that investment (\$272M) was required in the first 30 years of the replacement cycle. The need for this level of investment did not align with observed pipeline performance. With a low break rate of approximately 13 breaks per year, or 0.04 breaks per mile per year, the pipeline system appeared healthy and not in need of such a high level of replacement. Therefore, a performance-based definition was sought that could be used to plan and budget for asset replacement that reflected actual pipe performance and conditions. Resolution No. 1442 was adopted in 2014 to address replacement of Mesa Water District’s (Mesa Water®) pipeline and groundwater well assets.

Resolution No. 1442 Implementation

Resolution No. 1442 required quantifiable, measurable factors to drive water system asset replacement. For pipelines, this included non-destructive and destructive measurements of the pipe wall’s ability to resist internal forces (e.g., water pressure) and external loads (e.g., traffic and soil). Non-destructive testing was used to measure the average remaining pipe wall thickness for a segment of pipe. Approximately 12 miles of pipeline was evaluated by non-destructive testing (e.g., acoustics testing from 2014-2019). Where pipe walls appeared to have lost more than 30% of their original thickness, samples of the pipe were excavated and sent for destructive testing, including direct measurement of remaining pipe wall thickness, hydrostatic failure pressure, and crush load failure. A total of 23 pipe samples (5 metal and 18 asbestos cement (AC)) were excavated. The remaining useful life was estimated based on the results of the testing. It was determined that AC pipe can be expected to have a total average useful life of 142 years. As AC pipe is approximately 74% of Mesa Water’s system, this finding reduced the pipeline replacement requirements over the 100-year period by \$352M to \$200M, including a reduction of \$210M to \$62M in the first 30 years of the replacement cycle (Figure 2).

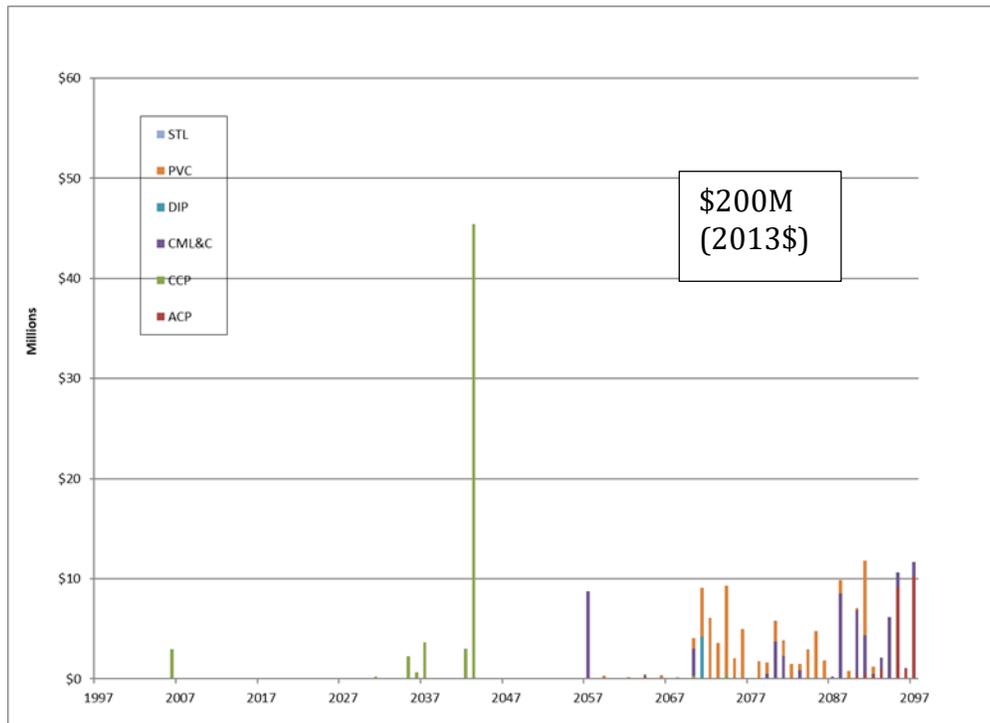


Figure 2. 100-Year Pipeline Renewal Forecast Implementing Res. No. 1442, 2014.

Resolution No. 1442 also required groundwater production well rehabilitation when production capacity from any well drops by more than 20%, or when overall well production capacity drops by more than 10%. Wells 1B, 3B, 5, and 7 have been rehabilitated since the adoption of Resolution No. 1442 as part of the Well Automation and Rehabilitation project. In addition, Well 9 was replaced with Well 9B in 2016. The overall production capacity for the clear groundwater wells was increased by 15% (nearly back to the original installed production capacity) or approximately 1,200 gallons per minute compared to the 2016 clear water well production capacity.

Resolution No. 1442 Challenges

While the findings and implementation of Resolution No. 1442 has been beneficial to Mesa Water for the last five years, it has not addressed all of the factors for pipeline replacement planning. As pipeline walls thin and approach the minimum thickness required to withstand hydrostatic pressure, it is expected that these pipelines will experience breaks. However, one AC pipeline that testing showed to be near its critical thickness had no breaks at all. And when AC and metal pipelines that had experienced multiple breaks were sent for testing, the results often showed decades of remaining useful life. This led to re-evaluation of Resolution No. 1442 to take break performance into account as part of the remaining useful life characterization. In addition, the key destructive testing requirement by Resolution No. 1442, hydrostatic failure pressure of pipelines, is no longer available in the United States or Canada for AC pipe due to regulatory considerations.

Implementation of Resolution No. 1442 for metal pipelines greater than 8" in diameter was also problematic. Metal pipeline walls tend to thin where the soil is more corrosive. This tends to occur at discrete points along the pipeline rather than continuously along the pipeline alignment. Insertion tools for measuring pipeline steel wall thickness and remaining useful life are maturing for smaller diameter pipelines. However, technologies for condition assessment of large diameter metal pipe are not yet able to measure pipeline steel wall thickness and remaining useful life.

DISCUSSION

The major proposed changes to Resolution No. 1442 are as follows:

- Pipeline break history and end of useful life will have to both occur prior to a pipeline being identified for replacement;
- Destructive testing will continue when a pipeline is exposed for valve replacements or pipeline repairs (approximately 60 per year);
- Non-destructive testing will continue to be performed on pipelines with a history of condition-related breaks; and
- Evaluate transmission and distribution pipelines separately.

New Insights

Working with Mesa Water’s pipeline consultants to improve the pipeline integrity program provided access to pipeline break data and pipeline wall thickness measurements from several water agencies in California. Several iterations of correlating pipeline wall thickness to pipeline breaks were considered. Positive correlations were found that have provided the following new insights to pipeline performance:

- 1. Synchronizing of Breaks and Remaining Useful Life:** Research of multiple pipeline breaks across multiple agencies have shown that, as pipelines approach the end of their useful life, breaks will exponentially increase (Figure 3).

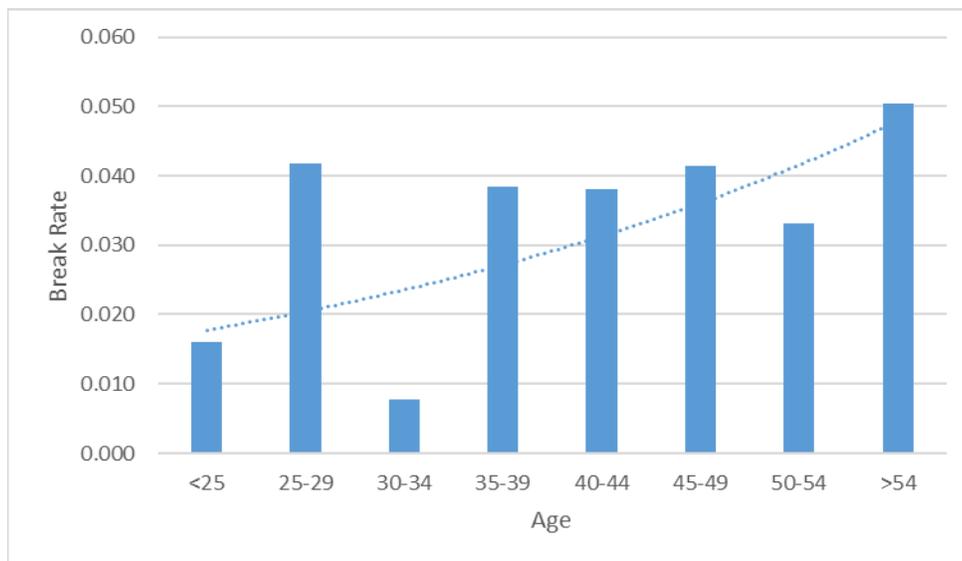


Figure 3. Relationship Between Number of Breaks and Pipeline Age.

The average useful life of the forecasted break rate for AC pipe is approximately 164 years, which is greater than the average useful life of 142 years based on destructive testing data. This is an example of why a pipe near its critical thickness can be identified for replacement based on remaining useful life, but has not yet experienced actual breaks. However, this assumes that pipelines were manufactured and installed correctly. Pipelines that actually show failures before the forecasted break rate or remaining useful life periods are examples of pipelines that had manufacturing defects or external factors affecting it. Thus, synchronization of break rate and remaining useful life is the next critical step in refining Mesa Water’s asset replacement policy.

2. Pipeline Segment Versus Cohort: Resolution No. 1442 defined a pipeline segment as the length of pipe that could be isolated for replacement by closing two adjacent valves. This definition prevented a broader understanding of the break history of a group of pipe segments that were installed together in one project. Pipelines installed together as one project are approximately the same age and can be assumed to be manufactured under similar conditions and to be installed by the same contractor. These installations can be grouped into “pipe cohort” groups of pipelines of similar age, material, and construction conditions that can be expected to perform in the same way. A key distinction made for the pipe cohorts is as follows:

- **Distribution Pipelines** (14-inch diameter and smaller): Distribution pipelines have customer services directly connected to them. A break in a distribution pipeline will affect the small number of customers in the vicinity of the break and cause minor property damage.
- **Transmission Pipelines** (16-inch diameter and greater): Transmission pipelines bring water to the distribution pipelines. A break in a transmission line can cause outages to entire neighborhoods and business districts, and result in major property damage due to the volume of water released.

Resolution No. 1442 Proposed Update

An update to Resolution No. 1442 (Attachment A) is being proposed that uses the break history of the pipe cohort group and pipe condition assessment to drive replacement decisions. Pipe cohorts with a higher break rate (breaks per mile per year) or overall number of breaks in the pipe cohort's lifetime will trigger a condition assessment using non-destructive testing to indirectly measure the remaining wall thickness and estimate remaining useful life. Pipe cohorts with lower break rates will be allowed to continue operation. Table 1 summarizes the break thresholds by pipe cohort group based on the criteria discussed above.

Table 1. Pipe Break Thresholds for Action

Type of Pipeline	Condition Assessment		Replacement		
	Number of Breaks	Annual Break Rate	Remaining Useful Life	Number of Breaks	Annual Break Rate
Distribution (14" Dia. and smaller)	3	0.2	<10 years	5	1.0
Transmission (16" Dia. and greater)	2	0.2	<10 years	3	0.5

Applying the proposed updates to Resolution No. 1442 to the pipeline system demonstrates that approximately 97% of the distribution system would remain in operation with no further action and approximately 3% of the system (10 miles) would receive non-destructive testing. The updated 100-year replacement cost curve for this scenario is shown in Figure 4.

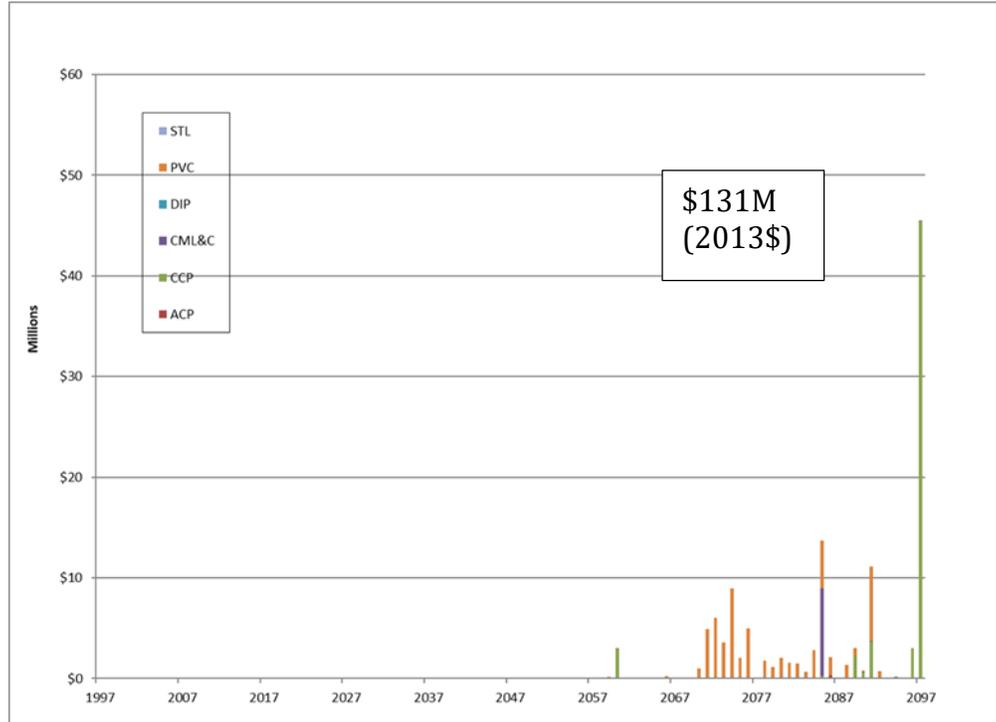


Figure 4. 100-Year Renewal Forecast Implementing Resolution No. 1525

Projecting the break rate by material type out until the replacement criterion is triggered, the assumed useful life for AC pipe is 164 years and for metallic pipe is 134 years. PVC pipe is too new a material with too few breaks to make a break rate prediction; therefore, 85 years of useful life is assumed for PVC. The 100-year replacement cost is \$131M, with an overall savings of \$426M (in 2013 dollars) from the original age-based replacement analysis.

Pipeline Integrity Testing Program Updates

Under the proposed Resolution No. 1525, the Pipeline Integrity Testing Program will also be updated. Non-destructive testing will continue to be performed in-situ with the pipe in operation. Exposed pipe testing will be performed whenever a pipe is exposed, such as a break repair, valve replacement, or new service connection. Soil samples from the pipe's immediate environment will also be collected and sent for corrosivity testing.

Non-Destructive Testing

- **AC pipe:** Staff have found that AC pipe wall thickness measurement using acoustic equipment to be valuable for screening average pipe wall thickness between system valves and hydrants. This technology will be continued for AC pipe per the proposed policy update.
- **Metal pipe:** For small diameter metal pipe, condition assessment using electromagnetic technologies inside the pipe to measure the steel wall thickness will be used.
- **PVC pipe:** As no PVC pipe currently needs non-destructive testing, test methods are limited and have not been evaluated further.

Exposed Pipe Testing

- **AC pipe:** The most useful test for determining remaining useful life of AC pipe is the combined phenolphthalein stain test and Scanning Electron Microscopy/Energy Dispersive X-Ray Spectroscopy (EDS). A small sample of AC pipe will be collected during valve replacements (approximately 60 per year) or pipeline break repairs.
- **Metal pipe:** As part of a break repair, staff will document the condition of the pipe with photographs and collect a soil sample for corrosivity testing.
- **PVC pipe:** If a portion of PVC is removed as part of a break repair, it will be collected and visually evaluated.

Clear Water Production Wells

Since the adoption of Resolution No. 1442, Mesa Water's five clear groundwater wells have been rehabilitated or re-drilled and are also performing well. Pump efficiency data is available in real time on the SCADA system. No changes are proposed to Resolution No. 1442's triggers for clear water well rehabilitation. Clear water production wells will be rehabilitated when well production drops by more than 20% for a given well, and overall clear water well production drops by more than 10%, taking into consideration the annual variation in groundwater levels. The well(s) prioritized for rehabilitation will be determined based on the highest loss of production capacity.

Continuous Improvement

Mesa Water's pipeline system continues to perform well, with a condition-related break rate over the five years of approximately 16.4 breaks per year, or 0.05 breaks per mile per year for the 317 miles of pipeline in the system. Staff recommends that the Board reevaluate Resolution No. 1525 in five years to determine if there are changes in the performance of the pipeline system or in condition assessment or pipeline renewal technologies that warrant an update to the policy.

FINANCIAL IMPACT

None.

ATTACHMENTS

Attachment A: Draft Resolution No. 1525

Attachment B: Resolution No. 1442, Redline

RESOLUTION NO. 1525

RESOLUTION OF THE MESA WATER DISTRICT BOARD OF DIRECTORS REGARDING THE REPLACEMENT OF ASSETS INCLUDING PIPELINE AND WELL REHABILITATION SUPERSEDING RESOLUTION NO. 1442

WHEREAS, the Mesa Water District (Mesa Water®) is a county water district organized and operating pursuant to the provisions of the laws of the State of California (State or California); and

WHEREAS, Mesa Water has assets that will eventually need to be replaced, abandoned, or discarded because they have a finite life; and

WHEREAS, currently the most valuable assets include the water distribution system and the water wells, which group of assets shall therefore be the scope of this resolution; and

WHEREAS, age alone is a poor indicator of individual asset condition and remaining useful life; and

WHEREAS, the useful life of an individual asset in an asset class may be longer or shorter than the average useful life for that class.

NOW, THEREFORE, THE BOARD OF DIRECTORS OF THE MESA WATER DISTRICT DOES HEREBY RESOLVE, DETERMINE, AND ORDER AS FOLLOWS:

Section 1. Effective October 10, 2019, assets will not be replaced solely because they have reached the average useful life for their asset class and assets will not be kept merely because they have not yet reached the average useful life for their asset class.

Section 2. Before an asset is included in a proposed budget for replacement, Mesa Water's staff will evaluate its replacement or rehabilitation need based on operations and maintenance cost, improvements in technology, changing laws and regulations, risk management/safety implications, market availability and repair history.

Section 3. Pipes in the water distribution system will be replaced when their useful life has been achieved. The pipeline useful life and pipeline cohort group herein are defined as follows:

- a) Pipeline Useful Life – The pipeline useful life will be deemed to have been reached if testing and pipe cohort performance exceeds limits described in Appendix A.
- b) A pipe cohort is a group of pipelines with similar characteristics that can be evaluated as a group. The similar characteristics include the following:
 - a. Installation Project Number
 - b. Material of Construction
 - i. Asbestos Cement Pipe (ACP)
 - ii. Polyvinyl Chloride (PVC)
 - iii. Metallic
 - c. Diameter
 - i. Transmission Pipelines 16 Inches and Above
 - ii. Distribution Pipelines 14 Inches or Less
 - d. Pipe Performance or Condition

Section 4. Groundwater production wells will be rehabilitated if and when well capacity drops by more than 20 percent for a given well, and overall clear water well capacity drops by more than 10 percent, taking into consideration the annual variation in groundwater levels. The well(s) prioritized for rehabilitation will be determined based on the highest loss of production capacity.

Section 5. The General Manager is hereby authorized and directed to take such actions as may be deemed necessary or advisable to effect the intent of the foregoing resolution.

Section 6. This Resolution shall be reevaluated in five years and supersedes Resolution No. 1442 and all other actions of the Board of Directors governing replacement of assets.

ADOPTED, SIGNED, and APPROVED this 10th day of October 2019 by a roll call vote.

AYES: DIRECTORS:
 NOES: DIRECTORS:
 ABSENT: DIRECTORS:
 ABSTAIN: DIRECTORS:

Shawn Dewane
 President, Board of Directors

Denise Garcia
 District Secretary

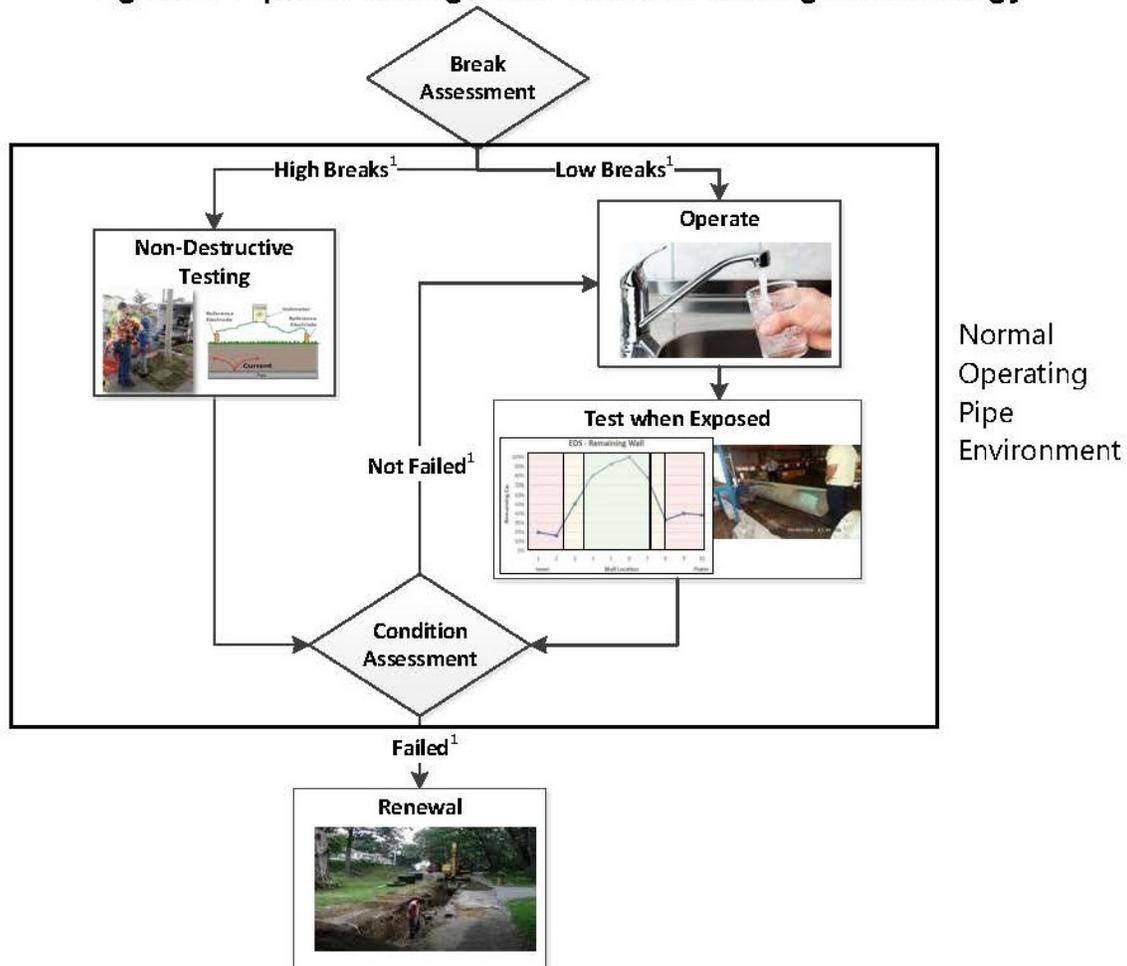
RESOLUTION NO. 1525

APPENDIX A

RESOLUTION OF THE MESA WATER DISTRICT BOARD OF DIRECTORS REGARDING THE REPLACEMENT OF ASSETS INCLUDING PIPELINE AND WELL REHABILITATION SUPERSEDING RESOLUTION NO. 1442

Figure 1 summarizes the METHODOLOGY that shall be used to determine whether a pipe cohort warrants opportunistic testing, proactive testing, and if the useful life has been achieved and should be replaced. The terms used are defined below:

Figure 1. Pipeline Management Decision Making Methodology



¹The definitions of "Low Breaks", "High Breaks", "Failed", and "Not Failed" are documented in Appendix A and dependent upon whether the pipe cohort is a transmission or distribution pipe.

- a) Breaks Assessment – The performance of each cohort will be evaluated on an annual basis. Pipes that are performing well will be classified as “low breaks” and the cohort will continue to be operated and tested as opportunities emerge. As cohorts approach the end of useful life, performance will deteriorate. Cohorts categorized as having a performance of “high breaks” will be assessed using proactive testing. The definitions of “high” and “low” breaks are included below:
- a. “High Breaks”
 - i. Distribution – If a distribution pipe cohort has 3 or more breaks and a historic break rate that exceeds 0.2 annual breaks per mile, the performance will be categorized as “high”.
 - ii. Transmission – If a transmission pipe cohort has 2 or more breaks and a historic break rate that exceeds 0.2 annual breaks per mile, the performance will be categorized as “high”.
 - b. “Low Breaks” – If the performance does not meet or exceed the thresholds for “high breaks” performance, the pipe cohort performance will be categorized as “low breaks” and the cohort will continue to be operated and tested as opportunities emerge.
- b) Exposed Pipeline Testing – When a pipe is exposed for another reason (e.g. service tap, break, valve replacement, pipe replacement), it provides a unique opportunity to cost effectively gather condition assessment data since roughly 90 percent of the cost of testing is in exposing the pipe. Testing varies by pipe material and will consist of the following:
- a. ACP – When a full ring sample or wall remnant can be taken, the sample will be collected and tested for remaining wall thickness.
 - b. PVC – If a stick of pipe must be removed as part of break response, the sample will be collected and tested.
 - c. Metallic – As part of break response, take photos of the pipe and collect a soil sample for corrosivity testing.
- c) Non-Destructive Testing – When the performance of a pipe begins to deteriorate, proactive testing will be used to determine if the useful life has been achieved and the pipe should be replaced. Examples of proactive testing used by Mesa Water include electromagnetic testing, acoustic velocity testing, close interval surveys, and pipe sampling and testing. Engineering staff will continuously learn about proactive testing technologies, and strategically apply cost-effective proactive condition assessment to the pipelines.
- d) Condition Assessment – When non-destructive or exposed pipeline testing is performed on a cohort, the results will be evaluated to determine if the useful life has been achieved and the cohort should be categorized as “failed” or “not failed”. The definitions of “failed” and “not failed” are included below:

- a. “Failed” – The cohort will be categorized as failed and considered for replacement if the condition assessment testing shows less than 10 years of remaining useful life and one of the following criteria are met:
 - i. Distribution cohorts
 - 1. Break rate exceeds 1.0 annual breaks per mile
 - 2. 5 or more condition-related breaks total
 - ii. Transmission cohorts
 - 1. Break rate exceeds 0.5 annual breaks per mile
 - 2. 3 or more condition-related breaks total
- b. “Not Failed” – If the performance does not meet or exceed the thresholds for “failed” condition, the pipe cohort will be categorized as “not failed” and the cohort will continue to be operated and assessed as opportunities emerge.
- e) Interagency Coordination – Staff will continue to meet with other local agencies such as the City of Costa Mesa and Costa Mesa Sanitary District to schedule water pipeline replacement projects in conjunction with other projects requiring road closures.
- f) This policy is designed to address typical decision-making. Staff shall apply good engineering and operational judgment and override this policy when special circumstances result in increased value for Mesa Water and ratepayers. This may include optimizing cohort boundaries or overriding decision-making. If the policy is overridden, staff shall gain approval from the Board prior to implementation.
- g) Staff shall refine and continuously improve this policy as lessons are learned.

RESOLUTION NO. ~~14421525~~

**RESOLUTION OF THE
MESA WATER DISTRICT BOARD OF DIRECTORS
REGARDING THE REPLACEMENT OF ASSETS
INCLUDING PIPELINE AND WELL REHABILITATION
SUPERSEDING RESOLUTION NO. ~~12681442~~**

WHEREAS, the Mesa Water District (Mesa Water®) is a county water district organized and operating ~~according to California Law; and~~ pursuant to the provisions of the laws of the State of California (State or California); and

WHEREAS, Mesa Water has assets that will eventually need to be replaced, abandoned, or discarded because they have a finite life; and

WHEREAS, currently the most valuable assets include the water distribution system and the water wells, which group of assets shall therefore be the scope of this resolution; and

~~WHEREAS, age alone is a poor indicator of individual asset condition and remaining useful life; and~~

WHEREAS, the useful life of an individual asset in an asset class may be longer or shorter than the average useful life for that class.

NOW, THEREFORE, THE BOARD OF DIRECTORS OF THE MESA WATER DISTRICT DOES HEREBY RESOLVE, DETERMINE, AND ORDER AS FOLLOWS:

Section 1. Effective ~~March 15, 2014~~ ~~October 10, 2019~~, assets will not be replaced solely because they have reached the average useful life for their asset class and assets will not be kept merely because they have not yet reached the average useful life for their asset class.

Section 2. Before an asset is included in a proposed budget for replacement, Mesa Water's staff will evaluate its replacement or rehabilitation need based on operations and maintenance cost, improvements in technology, changing laws and regulations, risk management/safety implications, market availability and repair history.

Section 3. Pipes in the water distribution system will be replaced when their useful life has been achieved. The pipeline useful life and pipeline ~~cohort group~~ ~~segment~~ herein are defined as follows:

a) ~~—Pipeline Useful Life:—~~

- ~~i.a) The pipeline useful life will be deemed to have been reached if non-destructive testing and has determined that the pipe cohort performance exceeds limits wall thickness has reduced to less than 70 percent of that of a new pipe per the Methodology described in Appendix A., or if a pipe failure rate greater than 0.1 breaks per mile per year has occurred in a given segment of pipe; and~~
- b) A pipe cohort is a group of pipelines with similar characteristics that can be evaluated as a group. The similar characteristics include the following:
- a. Installation Project Number
 - b. Material of Construction
 - i. Asbestos Cement Pipe (ACP)
 - ii. Polyvinyl Chloride (PVC)
 - iii. Metallic
 - c. Diameter
 - i. Transmission Pipelines 16 Inches and Above
 - ii. Distribution Pipelines 14 Inches or Less
 - d. Pipe Performance or Condition
 - ~~ii.—The pipeline useful life will be deemed to have been reached if destructive testing and reasonable engineering judgment determines that there is only a minimal safety factor between the measured burst pressure of a section of pipe from the pipe segment in question and that of a new pipe.~~
 - iii.—Should a pipeline reach 150 percent of its average age based useful life as defined by AWWA, then prior to replacement, conditions (i) and (ii) above shall be evaluated to confirm replacement need. Should conditions (i) and (ii) not be satisfied, the section of pipeline in question shall be tested every 5 years until replacement conditions are met.

b) ~~—Pipe segment:~~

- ~~i.—A pipe segment is the length of pipe that can be isolated by closure of existing gate valves or other appurtenances, which is generally the distance between pipeline intersections and/or a change in pipeline diameter, material, or year of installation.~~

Section 4. Groundwater production wells will be rehabilitated if and when well capacity drops by more than 20 percent for a given well, and overall clear water well capacity drops by more than 10 percent, taking into consideration the annual

variation in groundwater levels. The well(s) prioritized for rehabilitation will be determined based on the highest loss of production capacity.

Section 5. The General Manager is hereby authorized and directed to take such actions as may be deemed necessary or advisable to effect the intent of the foregoing resolution.

Section 6. This Resolution shall be reevaluated in ~~three to~~ five years and supersedes Resolution No. ~~12681442~~ and all other actions of the Board of Directors governing replacement of assets.

ADOPTED, SIGNED, and APPROVED this ~~15th day of March 2014~~ 10th day of October 2019 by a roll call vote.

AYES: DIRECTORS: ~~Atkinson, Bockmiller, Temianka, Dewane, Fisler~~
NOES: DIRECTORS:
ABSENT: DIRECTORS:
ABSTAIN: DIRECTORS:

~~James R. Fisler~~ Shawn Dewane
President, Board of Directors

~~Coleen L. Monteleone~~ Denise Garcia
District Secretary

RESOLUTION NO. 14421525

APPENDIX A

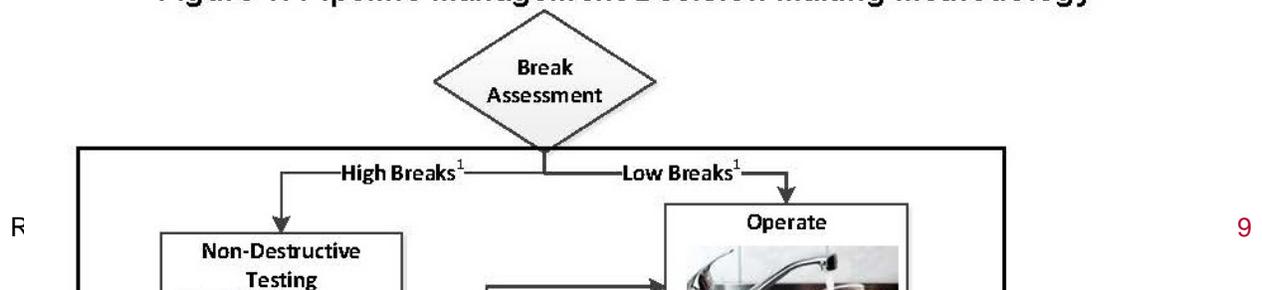
**RESOLUTION OF THE
MESA WATER DISTRICT BOARD OF DIRECTORS
REGARDING THE REPLACEMENT OF ASSETS
INCLUDING PIPELINE AND WELL REHABILITATION
SUPERSEDING RESOLUTION NO. 12681442**

Figure 1 summarizes the ~~The following~~ **METHODOLOGY** that shall be used ~~by Mesa Water staff~~ to determine ~~whether pipeline useful life:~~

- ~~a) Where no historical failure data is available, the default useful life shall be determined by the average industry standard age-based condition. Pipe segments that have less than 10 years of remaining life should be the focus of non-destructive testing identified in (c) below.~~
- ~~b) Where soil corrosivity testing has determined a high potential for pipe cohort warrants opportunistic testing, proactive testing, and if the useful life ~~corrosion~~, the pipe segments in these areas should be the focus of non-destructive testing identified in (c) below.~~
- ~~c) Each year approximately 1 percent of Mesa Water's distribution system shall be tested using a non-destructive testing method to determine remaining pipe wall thickness, based on the following priority:
 - ~~i. Pipe segments identified in (a) above~~
 - ~~ii. Pipe segments identified in (b) above~~
 - ~~iii. Pipe segments with the greatest age by decade~~
 - ~~iv. Pipe segments with the largest diameter~~~~
- ~~d) Where non-destructive testing has been achieved/performed, pipes identified with less than 70 percent of remaining wall thickness shall be subject to selective destructive testing to determine pipe burst pressure. If it is determined by the pipe burst pressure test and reasonable engineering judgment that an acceptable safety factor still exists for the anticipated operating pressure of the pipe compared with a new pipe, the pipe segment(s) in question will be allocated a remaining useful life of 10 years and should be replaced. The terms used/testing will be repeated within 5 years.~~

~~Where non-destructive testing methods are defined below:-~~

Figure 1. Pipeline Management Decision Making Methodology



DRAFT

- a) Breaks Assessment – The performance of each cohort will be evaluated on an annual basis. Pipes that are performing well will be classified as “low breaks” and the cohort will continue to be operated and tested as opportunities emerge. As cohorts approach the end of useful life, performance will deteriorate. Cohorts categorized as having a performance of “high breaks” will be assessed using proactive testing. The definitions of “high” and “low” breaks are included below:
- a. -“High Breaks”
 - i. Distribution — If a distribution pipe cohort has 3 or more breaks and a historic break rate that exceeds 0.2 annual breaks per mile, the performance will be categorized as “high”.
 - ii. Transmission — If a transmission pipe cohort has 2 or more breaks and a historic break rate that exceeds 0.2 annual breaks per mile, the performance will be categorized as “high”.
 - b. “Low Breaks” – If the performance does not meet or exceed the thresholds for “high breaks” performance, the pipe cohort performance will be categorized as “low breaks” and the cohort will continue to be operated and tested as opportunities emerge.
- b) Exposed Pipeline Testing – When a pipe is exposed for another reason (e.g. service tap, break, valve replacement, pipe replacement), it provides a unique opportunity to cost effectively gather condition assessment data since roughly 90 percent of the cost of testing is in exposing the pipe. Testing varies by pipe material and will consist of the following:
- a. ~~Asbestos-Cement Pipe~~ – When a full ring sample or wall remnant can be taken, the sample will be collected and tested for remaining wall thickness.
 - b. PVC – If a stick of pipe must be removed as part of break response, the sample will be collected and tested.
 - c. Metallic – As part of break response, take photos of the pipe and collect a soil sample for corrosivity testing.
- c) Non-Destructive Testing – When the performance of a pipe begins to deteriorate, proactive testing will be used to determine if the useful life has been achieved and the pipe should be replaced. Examples of proactive testing used by Mesa Water include electromagnetic testing, acoustic velocity testing, close interval surveys, and pipe sampling and testing. Engineering staff will continuously learn about proactive testing technologies, and strategically apply cost-effective proactive condition assessment to the pipelines.
- d) Condition Assessment – When non-destructive or exposed pipeline testing is performed on a cohort, the results will be evaluated to determine if the useful life has been achieved and the cohort should be categorized as “failed” or “not failed”. The definitions of “failed” and “not failed” are included below:

- a. “Failed” – The cohort will be categorized as failed and considered for replacement if the condition assessment testing shows less than 10 years of remaining useful life and one of the following criteria are met:
 - i. Distribution cohorts
 - 1. Break rate exceeds 1.0 annual breaks per mile
 - 2. 5 or more condition--related breaks total
 - ii. Transmission cohorts
 - 1. Break rate exceeds 0.5 annual breaks per mile
 - 2. 3 or more condition--related breaks total
- b. “Not Failed” – If the performance does not meet or exceed the thresholds for “failed” condition, the pipe cohort will be categorized as “not failed” and the cohort will continue to be operated and assessed as opportunities emerge.
- e) Interagency Coordination – Staff will continue to meet with other local agencies such as the City of Costa Mesa and Costa Mesa Sanitary District to schedule water pipeline replacement projects in conjunction with other projects requiring road closures.
- f) This policy is designed to address typical decision-making. Staff shall apply good engineering and operational judgment and override this policy when special circumstances result in increased value for Mesa Water and ratepayers. This may include optimizing cohort boundaries or overriding decision-making. If the policy is overridden, staff shall gain approval from the Board prior to implementation.
- g) Staff shall refine and continuously improve this policy as lessons are learned.
- ~~e) not yet available or not suitable for the given pipe material (such as CMLC, steel, DIP or other ferrous pipeline materials) destructive testing shall be performed on selected pipe segments within approximately 1 percent of Mesa Water’s distribution system each year. If it is determined through such destructive testing methods and reasonable engineering judgment that the pipe still has an acceptable safety factor, the pipe segment(s) in question shall be allocated a remaining useful life of 15 years. If on the other hand, it is determined through such destructive testing methods and reasonable engineering judgment that the pipe segment(s) do not have an acceptable safety factor, the pipe segment(s) in question shall be deemed to have reached their useful life and shall be recommended for replacement.~~



*Dedicated to
Satisfying our Community's
Water Needs*

MEMORANDUM

TO: Board of Directors
FROM: Celeste Carrillo, Public Affairs Coordinator
DATE: October 10, 2019
SUBJECT: Outreach Topic - Water Quality

RECOMMENDATION

Receive the presentation.

STRATEGIC PLAN

Goal #4: Increase public awareness about Mesa Water and about water.
Goal #6: Provide outstanding customer service.

DISCUSSION

Mesa Water District's (Mesa Water®) outreach program aims to connect Mesa Water with its constituents to achieve Goal #4 of the Board of Directors' (Board) Strategic Plan. Outreach activities include educating and informing the District's constituents about Mesa Water, water issues, and water in general.

Mesa Water's constituents include external audiences such as customers, community members, elected officials, industry colleagues, water districts, special districts, and media; as well as internal audiences such as staff, retirees and Board members.

As part of these ongoing outreach efforts, staff will roll out training of Mesa Water's key messages to the Board and staff, to support communications with constituents. These key messages will act as a tool from which all presentations, interviews, website content, social media content, collateral materials, community meetings and discussions, are composed. These messages will also provide consistency in tone and messaging that speaks to Mesa Water's mission and value to the community. The first key message will highlight Water Quality.

FINANCIAL IMPACT

None.

ATTACHMENTS

None.



*Dedicated to
Satisfying our Community's
Water Needs*

MEMORANDUM

TO: Board of Directors
FROM: Celeste Carrillo, Public Affairs Coordinator
DATE: October 10, 2019
SUBJECT: Mesa Water District Customer Survey

RECOMMENDATION

This item is provided for discussion.

STRATEGIC PLAN

Goal #4: Increase public awareness about Mesa Water and about water.
Goal #6: Provide outstanding customer service.

PRIOR BOARD ACTION/DISCUSSION

In November 2008, four years prior to the District's rebranding, Mesa Water District (Mesa Water®) conducted a survey of its customers' awareness of – and satisfaction with – the District.

In 2012, staff conducted a Request for Proposal process for survey services that resulted in retaining Probolsky Research to conduct two follow-up customer surveys for the District, the first of which was done in June 2012, and the second of which was done in February 2015.

At its July 22, 2019 meeting, the Legislative and Public Affairs Committee received information that staff was developing a Request for Qualifications for a new baseline survey. The survey's purpose is to serve as a benchmark for measuring the effectiveness of Mesa Water's communications and customer services efforts, and for planning future communications and customer services programs.

At its September 12, 2019 meeting, the Board of Directors (Board) awarded a contract to True North Research, Inc. for \$34,875 per year to conduct the Mesa Water District Customer Survey.

DISCUSSION

The purpose of the customer survey is to serve as a benchmark for measuring the effectiveness of Mesa Water District's (Mesa Water®) communications and customer services efforts, and for planning future communications and customer services programs.

Attached is the draft customer survey questionnaire for the Board's review and to provide staff with feedback. Staff will present the final draft customer survey questionnaire at the October 21, 2019 Legislative and Public Affairs Committee meeting, at which time staff will request the Board's approval of the questionnaire "as is" or with further input provided at the meeting.

Following an analysis of the customer survey results, True North Research, Inc. plans to present its report at the January 9, 2020 Board meeting.



FINANCIAL IMPACT

In Fiscal Year 2020, \$35,000 has been budgeted for the Mesa Water District Customer Survey; no funds have been spent to date.

ATTACHMENTS

Attachment A: True North Research, Inc. Mesa Water District Draft Customer Opinion Survey

Section 1: Introduction to Study

Hi, may I please speak to: _____. Hi, my name is _____ and I'm calling on behalf of TNR, an independent public opinion research company. We're conducting a survey about important issues in Costa (Coast-uh) Mesa, Newport Beach, and nearby Orange County areas and we would like to get your opinions.

If needed: This is a survey about community issues - I'm NOT trying to sell anything and I won't ask for a donation.

If needed: The survey should take about 12 minutes to complete.

If needed: If now is not a convenient time, can you let me know a better time so I can call back?

Section 2: Screener

SC1	Before we begin, are you at least 18 years of age?		
	1	Yes	<i>Continue</i>
	2	No	<i>Ask to speak to an adult in the household if land line. Otherwise Terminate.</i>
	99	Not sure / Prefer not to answer	<i>Terminate</i>

Section 3: Importance of Issues

Q1	To begin, what do you feel is the most important issue facing your community today?							
	<i>Record verbatim response</i>							
	98	Not sure						
	99	Prefer not to answer						
Q2	Next, I'm going to read a list of issues facing your community and for each one, please tell me how important you feel the issue is to <u>you</u> , using a scale of extremely important, very important, somewhat important or not at all important.							
	Here is the (first/next) issue: _____. Do you think this issue is extremely important, very important, somewhat important, or not at all important?							
	<i>Randomize</i>		Extremely Important	Very Important	Somewhat Important	Not at all Important	Not sure	Prefer not to answer
A	Having a reliable supply of drinking water		1	2	3	4	98	99
B	Being prepared for emergencies and natural disasters		1	2	3	4	98	99
C	Improving the quality of education in local public schools		1	2	3	4	98	99
D	Maintaining local streets and roads		1	2	3	4	98	99
E	Improving public safety		1	2	3	4	98	99
F	Reducing traffic congestion		1	2	3	4	98	99

<i>Section 4: Water Reliability</i>						
Next, I'm going to ask you a few questions about drinking water supplies.						
Q3	<p>A reliable water supply is one that can be depended upon to consistently provide enough water to meet a region's needs.</p> <p>Overall, do you expect that the reliability of water supplies in _____ will be improving, staying about the same, or getting worse over the next five years?</p>					
<i>Read in Order</i>		Improving	Staying about the same	Getting worse	Not sure	Prefer not to answer
A	California	1	2	3	5	99
B	Orange County	1	2	3	5	99
C	Your community	1	2	3	5	99
Q4	Overall, how reliable do you think your household's water supply is going to be over the next five years? Do you think it will be very reliable, somewhat reliable, somewhat unreliable, or very unreliable?					
	1	Very reliable				
	2	Somewhat reliable				
	3	Somewhat unreliable				
	4	Very unreliable				
	98	Not sure				
	99	Prefer not to answer				
Q5	Thinking of the water your household receives, which of the following statements do you think is accurate: _____ OR _____? <i>Rotate Statements</i>					
	1	100% of the water is produced locally				
	2	Some of the water is imported from Northern California and the Colorado River				
	98	Not sure				
	99	Prefer not to answer				

<i>Section 5: Awareness & Opinions of Mesa Water</i>			
Q6	Do you happen to know which agency is responsible for providing water services to your home?		
	1	Yes	<i>Ask Q7</i>
	2	No	<i>Skip to Q8</i>
	99	Prefer not to answer	<i>Skip to Q8</i>

Q7	What is the name of the agency?					
		<i>Record verbatim response</i>				
	98	Not sure				
	99	Prefer not to answer				
Q8	Prior to taking this survey, had you heard of the Mesa Water District ?					
	1	Yes				
	2	No				
	99	Prefer not to answer				
Q9	<p>To clarify, the Mesa Water District is the independent public agency responsible for providing water services to your household.</p> <p>In general, do you have a favorable or unfavorable opinion of the Mesa Water District – or do you not have an opinion either way? <i>If favorable or unfavorable, ask: Would that be very (favorable/unfavorable) or somewhat (favorable/unfavorable)?</i></p>					
	1	Very favorable		<i>Skip to Q11</i>		
	2	Somewhat favorable		<i>Skip to Q11</i>		
	3	Somewhat unfavorable		<i>Ask Q10</i>		
	4	Very unfavorable		<i>Ask Q10</i>		
	98	No opinion		<i>Skip to Q11</i>		
	99	Prefer not to answer		<i>Skip to Q11</i>		
Q10	Is there a particular reason why you have an <u>unfavorable</u> opinion of the Mesa Water District?					
		<i>Record Verbatim Response – Record up to first 2 responses.</i>				
	2	No particular reason				
	98	Don't Know				
	99	Prefer not to answer				
Q11	<p>Next, I'm going to read a series of words or phrases. For each I read, I'd like you to tell me whether – in your opinion – it accurately describes the Mesa Water District. 'Yes' means you think the phrase does accurately describe the Mesa Water District. No means it does not. If you don't have an opinion, just say so.</p> <p>Here is the (first/next) one: _____. Do you think this phrase accurately describes the Mesa Water District?</p>					
	<i>Randomize</i>		Yes	No	No Opinion	Prefer not to answer
A	Trustworthy		1	2	98	99
B	Fiscally responsible		1	2	98	99

C	Beneficial to the local economy	1	2	98	99
D	Involved in the community	1	2	98	99
E	Efficient	1	2	98	99

Section 6: Satisfaction with Water Services

Q12 Generally speaking, are you satisfied or dissatisfied with the job the Mesa Water District is doing to provide water services to your household? *Get answer, then ask:* Would that be very (satisfied/dissatisfied) or somewhat (satisfied/dissatisfied)?

1	Very satisfied	
2	Somewhat satisfied	
3	Somewhat dissatisfied	
4	Very dissatisfied	
98	Don't Know	
99	Prefer not to answer	

Q13 Next, I'm going to read a list of specific services provided by the Mesa Water District. For each of the services I read, please tell me whether you are satisfied or dissatisfied with the District's efforts to provide the service.

Are you satisfied or dissatisfied with the District's efforts to: _____, or do you not have an opinion? *Get answer. If 'satisfied' or 'dissatisfied', then ask:* Would that be very (satisfied/dissatisfied) or somewhat (satisfied/dissatisfied)?

	<i>Randomize</i>	Very Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Very Dissatisfied	No Opinion	Prefer not to Answer
A	Protect the water supply from contamination and pollutants	1	2	3	4	98	99
B	Ensure an adequate water supply now and in the future	1	2	3	4	98	99
C	Educate customers about ways to conserve water	1	2	3	4	98	99
D	Keep the water system in good condition through timely repairs and maintenance	1	2	3	4	98	99
E	Provide reliable water service	1	2	3	4	98	99
F	Communicate with customers about scheduled repairs, service disruptions and other water-related issues	1	2	3	4	98	99
G	Provide water that tastes good	1	2	3	4	98	99
H	Provide water that is safe to drink	1	2	3	4	98	99
I	Provide water that is free of color and odor	1	2	3	4	98	99
J	Provide sufficient water pressure	1	2	3	4	98	99

K	Offer good value for the cost of water services	1	2	3	4	98	99
L	Provide good customer service	1	2	3	4	98	99
M	Provide rebate programs that encourage customers to purchase water-efficient appliances	1	2	3	4	98	99
N	Provide convenient hours of operation	1	2	3	4	98	99
O	Provide accurate billing statements	1	2	3	4	98	99

Section 7: Customer Service

Q14	In the past 12 months, have you contacted the Mesa Water District for any reason?		
	1	Yes	Ask Q15
	2	No	Skip to Q18
	98	Not sure	Skip to Q18
	99	Prefer not to answer	Skip to Q18
Q15	For what reason did you contact the District? <i>Do Not Read List. Record up to first 3 responses.</i>		
	1	Problem with water service (leak, disruption of service, quality, etc.)	
	2	Request start/stop of service	
	3	Questions about billing/payments	
	4	Make payment/Pay bill	
	5	Find out how to save water/reduce bill	
	6	Learn about/Participate in rebate program	
	7	Learn about/Participate in water conservation programs	
	8	Learn about/Participate in gardening /landscaping classes	
	9	Other <i>specify</i>	
	98	Not sure	
	99	Prefer not to answer	

Q16		Was the reason you contacted them resolved to your satisfaction?				
	1	Yes				
	2	No				
	98	Not sure				
	99	Prefer not to answer				
Q17		In your opinion, is the <u>staff</u> at the District very _____, somewhat _____, or not at all _____? <i>(Read one item at a time, continue until all items are read).</i>				
<i>Randomize</i>		Very	Somewhat	Not at all	Not sure	Prefer not to answer
A	Helpful	1	2	3	98	99
B	Professional	1	2	3	98	99
C	Knowledgeable	1	2	3	98	99

Section 8: Communication	
Q18 In general, are you satisfied or dissatisfied with the District’s efforts to communicate with customers through direct mail, newsletters, social media, and other means? <i>Get answer, then ask: Would that be very (satisfied/dissatisfied) or somewhat (satisfied/dissatisfied)?</i>	
	1 Very satisfied
	2 Somewhat satisfied
	3 Somewhat dissatisfied
	4 Very dissatisfied
	98 Not Sure
	99 Prefer not to answer
Q19 Do you recall receiving the <i>News on Tap</i> Newsletter, which periodically comes with your water bill?	
	1 Yes Ask Q20
	2 No Skip to Q21
	98 Not sure Skip to Q21
	99 Prefer not to answer Skip to Q21

Q20	How often would you say that you read the News on Tap Newsletter? Would you say that you always read it, sometimes read it, rarely read it, or never read it?					
	1	Always				
	2	Sometimes				
	3	Rarely				
	4	Never				
	99	Prefer not to answer				
Q21	As I read the following ways that the Mesa Water District can communicate with residents, I'd like to know if you think they would be a very effective, somewhat effective, or not at all effective way for the District to communicate with you.					
	<i>Randomize</i>		Very	Somewhat	Not at all	Not sure / Prefer not to answer
A	Email		1	2	3	99
B	Electronic Newsletters		1	2	3	99
C	Social Media like Twitter, Facebook and Instagram		1	2	3	99
D	Mesa Water District website		1	2	3	99
E	Newsletters and other materials mailed directly to your house		1	2	3	99
F	YouTube Videos		1	2	3	99
G	Sponsoring community events		1	2	3	99

Section 9: Background/Demographics		
Thank you so much for your participation. I have just a few background questions for statistical purposes.		
D1	In what year were you born?	
	<i>Record four-digit year</i>	
	99	Prefer not to answer
D2	What is your gender? <i>Record by voice if phone interview</i>	
	1	Male
	2	Female
	3	Other
	99	Prefer not to answer

D3	Do you own or rent your current residence?	
	1	Own
	2	Rent
	3	Live with family / friends and don't pay rent
	99	Prefer not to answer
D4	Does your household pay the water bill directly, or is it paid for by someone else like a landlord or Home Owner's Association?	
	1	Household pays bill directly
	2	Someone else pays bill
	98	Not sure
	99	Prefer not to answer
D5	Which of the following best describes your current home?	
	1	Single family detached home
	2	Apartment
	3	Condominium or townhome
	4	Mobile home
	99	Prefer not to answer
Those are all of the questions that I have for you! Thanks so much for participating in this important survey!		

REPORTS:

12. REPORT OF THE GENERAL MANAGER:
 - September Key Indicators Report
 - Other (no enclosure)

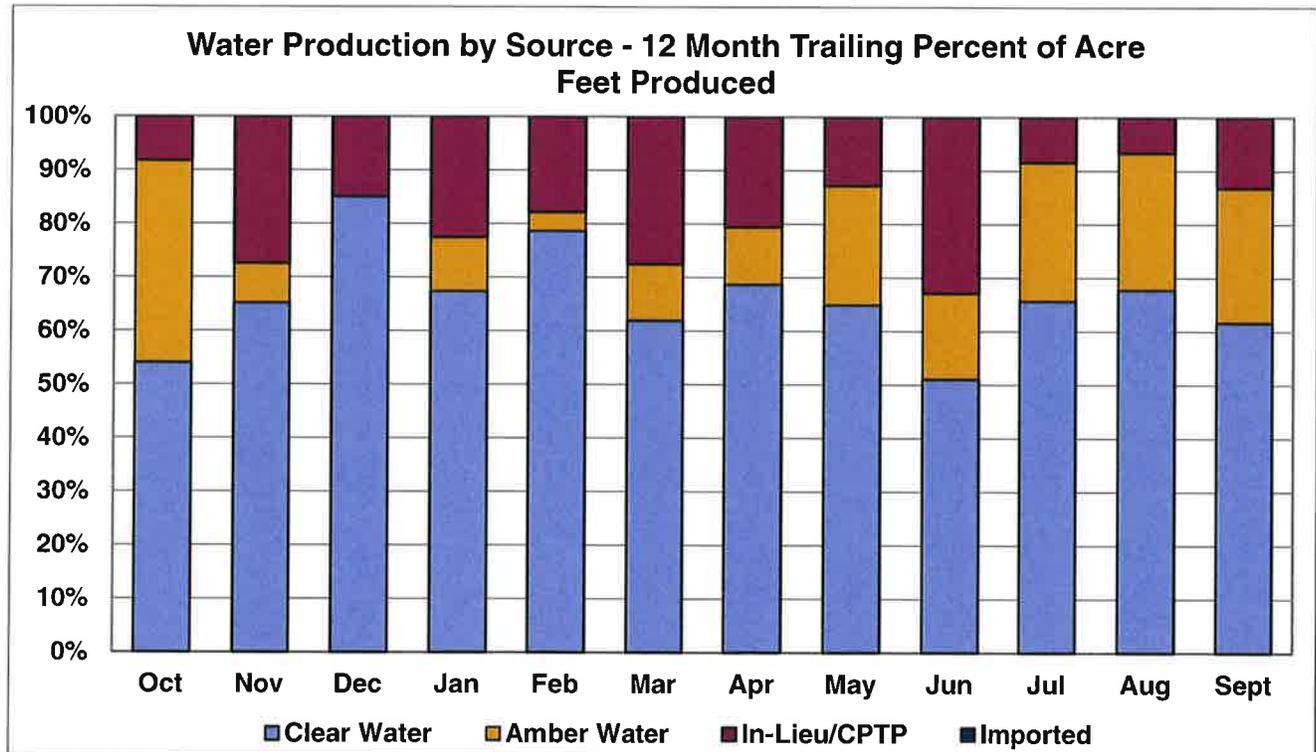
**Monthly Key Indicators Report
For The Month of September 2019**

Goal #1: Provide a safe, abundant, and reliable water supply

FY 2020 Potable Production (Acre Feet)

Water Supply Source	FY 2020 YTD Actual (AF)	FY 2020 YTD Budget (AF)	FY 2020 Annual Budget (AF)
Clear Water	3,126	2,559	11,161
Amber Water (MWRP)	1,227	1,500	4,087
Imported	0	0	0
Basin Management Water	449	1,100	2,500
Total Production	4,802	5,159	17,748

YTD actual water production (AF) through September 30, 2019



**Monthly Key Indicators Report
For The Month of September 2019**

Goal #1: Provide a safe, abundant, and reliable water supply

FY19 System Water Quality – This data reflects samples taken in August

Distribution System:	Average	Range	MCL
Chlorine Residual (mg/L) <i>Compliance</i>	1.91	0.26 – 3.03 Current RAA = 1.76	4 RAA
Coliform Positive % <i>Compliance</i>	0	0	5
Temperature (° F)	79.3	73 – 85	None

Reservoir I & II:	Average	Range	MCL
Chlorine Residual (mg/L)	1.35	0.23 – 2.08	None
Monochloramine (mg/L)	1.33	0.20 – 2.11	None
Ammonia (mg/L)	0.30	0.05 - 0.46	None
Temperature (° F)	77.3	74 – 83	None

Wells (Treated):	Average	Range	MCL
Chlorine Residual (mg/L)	2.40	2.03 – 3.00	None
Monochloramine (mg/L)	2.40	2.18 – 2.98	None
Ammonia (mg/L)	0.51	0.42 - 0.75	None
Temperature (° F)	80.0	75 - 81	None

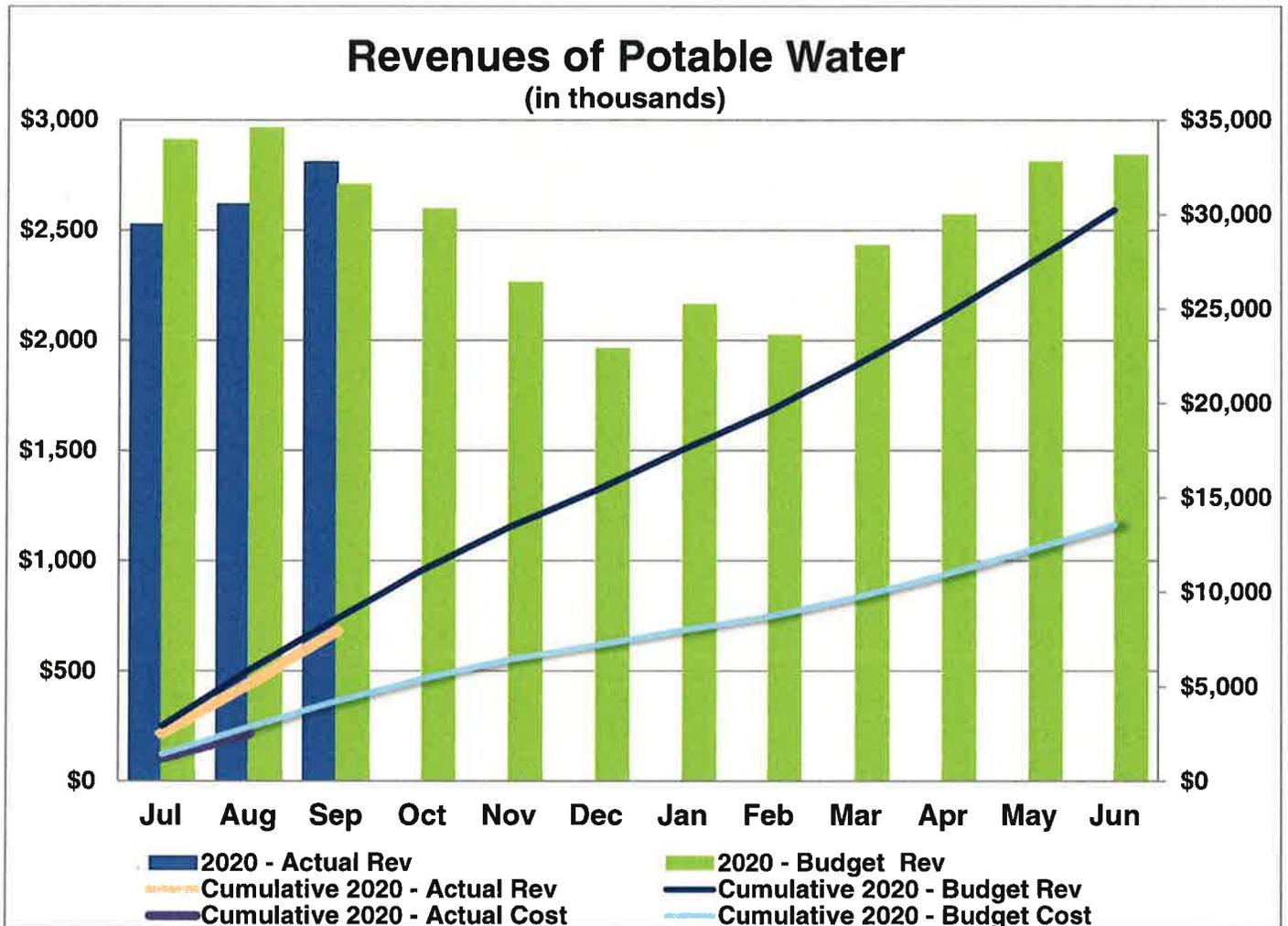
MWRF:	Average	Range	MCL
Chlorine Residual (mg/L)	2.57	2.03 – 2.79	None
Monochloramine (mg/L)	2.46	2.04 – 2.82	None
Ammonia (mg/L)	0.55	0.27 – 0.67	None
Temperature (° F)	83.5	82 – 85	None
Color (CU) <i>Compliance</i>	ND	ND	15
Odor (TON) <i>Compliance</i>	1	1 – 1	3

Water Quality Calls/Investigations:

Total Calls	5
Total Investigations (from calls)	2

**Monthly Key Indicators Report
For The Month of September 2019**

Goal #2: Practice perpetual infrastructure renewal and improvement



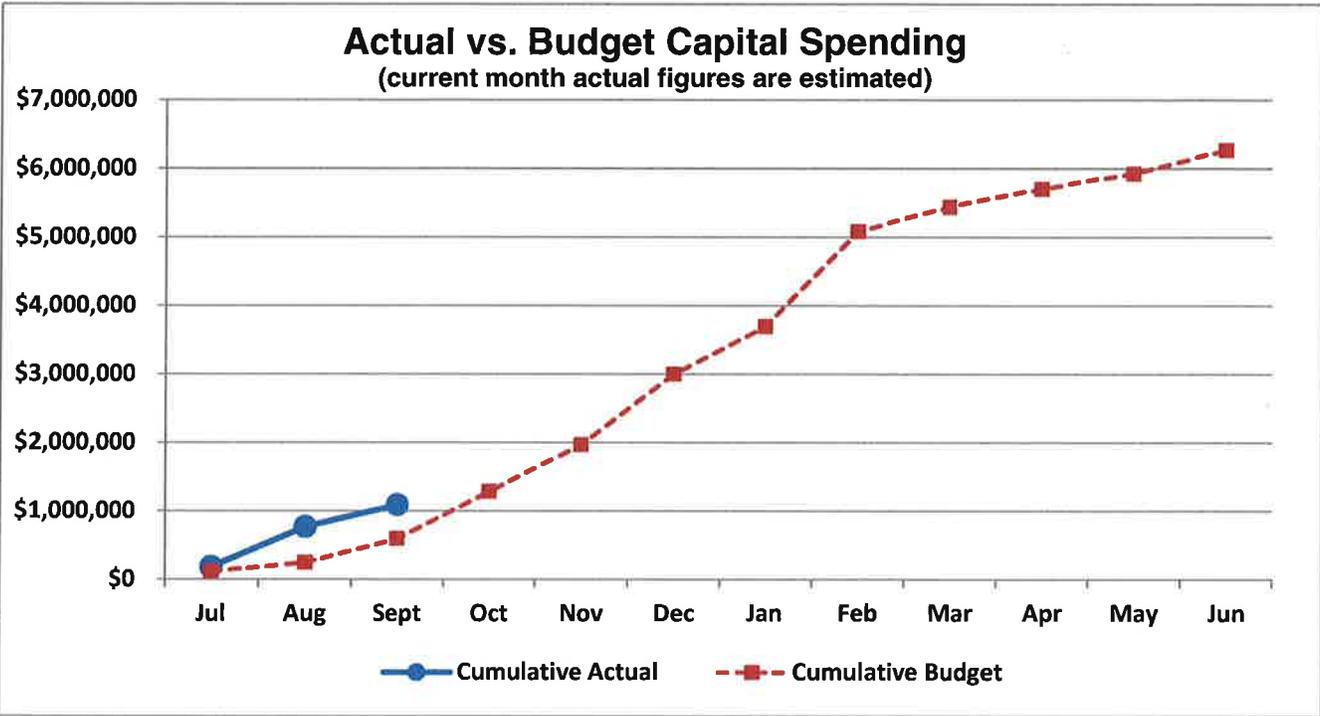
	Actual	Budget	Favorable (Unfavorable)	
			Difference	%
Total YTD Revenue \$	7,949,297	8,576,444	(627,147)	(7.31%)

	Actual	Budget	UnFavorable (Favorable)	
			Difference	%
Total YTD Cost \$ *	2,511,334	2,862,129	(350,795)	(12.26%)

* YTD Cost is trailing YTD Revenue by one month due to the timing of when costs are available.

Monthly Key Indicators Report
For The Month of September 2019

Goal #3: Be financially responsible and transparent



**Monthly Key Indicators Report
For The Month of September 2019**

Goal #4: Increase public awareness about Mesa Water and about water

Web Site Information

Web Site Information	August 2019	September 2019
Visits to the web site	7392	11373
Unique visitors (First time to the site)	4712	7329
Average per day	238	379
Average visit length	1 minute, 37 seconds	2 minute, 12 seconds
Page visited most	Online Bill Pay	Online Bill Pay
Second most visited page	Home	Home
Third most visited page	Human Resources	Costa Mesa Fish Fry
Fourth most visited page	Contact	Payment Options
Fifth most visited page	Payment Options	Human Resources
Most downloaded file	2019 Water Quality Report	2019 Water Quality Report
Second most downloaded file	Standard Specifications and Standard Drawings for the Construction of Water Facilities	Online Bill Pay Instructions
Most active day of the week	Thursday	Monday
Least active day of the week	Sunday	Sunday

Total visits since June 1, 2002	<u>1,362,376</u>
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Water Vending Machine Information

Vending Machine Location	Vend Measurement	September 2019 Vends	Totals Vends
Mesa Water Office	1 gal	6,645	374,876

Monthly Key Indicators Report
For the Month of September 2019
Goal #5: Attract and retain skilled employees

DEPARTMENT:	FY 2020			COMMENTS:
	BUDGET	FILLED	VACANT	
OFFICE OF THE GENERAL MANAGER:				
General Manager	1.00	1.00	0.00	
Business Administrator	1.00	1.00	0.00	
Subtotal	2.00	2.00	0.00	
ADMINISTRATIVE SERVICES:				
Administrative Services	5.00	5.00	0.00	
Subtotal	5.00	5.00	0.00	
CUSTOMER SERVICES:				
Conservation	1.00	1.00	0.00	
Customer Service	9.00	8.00	1.00	<i>Field Customer Service Representative - vacant/on hold</i>
Subtotal	10.00	9.00	1.00	
ENGINEERING:				
Engineering	4.00	4.00	0.00	
Subtotal	4.00	4.00	0.00	
EXTERNAL AFFAIRS:				
Legislative & Governmental Affairs	1.50	1.50		
Subtotal	1.50	1.50	0.00	
FINANCIAL SERVICES:				
Financial Reporting/ Purchasing	4.00	4.00	0.00	<i>Accounting Technician I/II/Sr. Accounting Technician - vacant/recruitment in process</i>
Accounting	1.00	0.00	1.00	
Subtotal	5.00	4.00	1.00	
HUMAN RESOURCES:				
Human Resources	3.00	2.00	1.00	<i>Sr. Human Resources Analyst - vacant/using temporary assistance</i>
Subtotal	3.00	2.00	1.00	
PUBLIC AFFAIRS:				
Outreach, Education & Communications	2.50	1.50	1.00	<i>Public Affairs Manager - vacant/on hold</i>
Subtotal	2.50	1.50	1.00	
WATER OPERATIONS:				
Supervision/Support	6.00	6.00	0.00	<i>Operator I/II - vacant/recruitment in process</i>
Distribution	10.00	9.00	1.00	
Production	3.00	3.00	0.00	
Water Quality	2.00	2.00	0.00	
Subtotal	21.00	20.00	1.00	
* TOTAL BUDGETED POSITIONS:	54.00	49.00	5.00	

**Monthly Key Indicators Report
For The Month of September 2019**

Goal #6: Provide outstanding customer service

Customer Calls

Call Type	FY20 YTD	September 2019	YTD Weekly Average
General Billing Question	636	225	49
Service Requests	479	182	37
High Bill	516	193	40
Payments	542	201	42
Late Fee	1029	718	79
Account Maintenance	213	86	16
On-Line Bill Pay	2022	989	156
Water Pressure	9	3	1
No Water	80	22	6
Conservation	108	36	8
Water Waste	44	19	3
Other (District info. other utility info. etc.)	949	362	73
Rate Increase	0	0	0
Fluoridation	0	0	0
TOTAL CUSTOMER CALLS	6627	3036	510
AVERAGE ANSWER TIME (Seconds)	10	10	10

Online Bill Pay Customers

Current Customers Enrolled	FY 2020 YTD	Sept 2019	YTD Weekly Average
5314	5314	4762	409

REPORTS:

13. DIRECTORS' REPORTS AND COMMENTS

**DIRECTORS' REPORTS (AB 1234) PER CA GOVERNMENT
CODE SECTION 53232.3 (d)**

In accordance with CA Government Code 53232.3 (d), the following report identifies the meetings for which Mesa Water Directors received expense reimbursement.

Jim Atkinson Meetings Attended

Reimbursement Date:	Description, Date
09/27/19	MWDOC Admin & Finance Committee Meeting, 9/11
09/27/19	MWDOC Public Affairs & Legislation Committee Meeting, 9/16
09/27/19	WACO Planning Committee Meeting, 9/17
09/27/19	MWDOC Board Meeting, 9/18
09/27/19	Meeting w/ General Manager, 9/26

Fred R. Bockmiller, P.E. Meetings Attended

Reimbursement Date:	Description, Date
09/27/19	OCWD Board Meeting, 9/4
09/27/19	OCWD Board Meeting, 9/18
09/27/19	Meeting w/ General Manager, 9/25
09/27/19	MWD Tour of Hoover Dam and Colorado River Aqueduct, 9/27

Marice H. DePasquale Meetings Attended

Reimbursement Date:	Description, Date
09/18/19	ACWA Communications Committee Meeting, 9/12
09/27/19	WACO Meeting, 9/6
09/27/19	Roses, Radishes & The Royalty Award, 9/25

Shawn Dewane Meetings Attended

Reimbursement Date:	Description, Date
09/27/19	Well Wisher Meeting, 9/13
09/27/19	Roses, Radishes & The Royalty Award, 9/25

James R. Fisler Meetings Attended

Reimbursement Date:	Description, Date
09/27/19	ISDOC Executive Committee Meeting, 9/3
09/27/19	Santa Margarita Water District Board Meeting, 9/4
09/27/19	WACO Meeting, 9/6
09/27/19	Meeting w/ South Coast Water District, 9/17
09/27/19	Roses, Radishes & The Royalty Award, 9/25

There are no support materials for this item.

CLOSED SESSION:

16. CONFERENCE WITH LEGAL COUNSEL – EXISTING LITIGATION:
Pursuant to California Government Code Sections 54956.9 (d)(1) and 54954.5 (c)
Case: *Mesa Water District v. KDC, INC., dba KDC SYSTEMS, INC., dba DYNALECTRIC*
Orange County Superior Court Case No. 30-2016-00832860-CU-BC-CJC

CLOSED SESSION:

17. CONFERENCE WITH SPECIAL LEGAL COUNSEL – EXISTING LITIGATION
Pursuant to California Government Code Section 54956.9 (d)(1)
Case: *Irvine Ranch Water District v. Orange County Water District and related cross-actions*
Los Angeles County Superior Court Case Nos. BS168278 and BS175192