AGENDA

AB 361 REMOTE MEETING NOTICE

This meeting is being held virtually pursuant to AB 361 as meeting in person may present imminent risks to the health or safety of attendees. The public may participate in this meeting remotely via zoom as set forth below.

INSTRUCTIONS FOR USING ZOOM

- Join the meeting using the link below.
- You must have audio and microphone capabilities on the device you are using to join the meeting.
- When you join the meeting make sure that you join the meeting with audio and follow the prompts to test your speaker & microphone prior to joining the meeting.

TO SPEAK ON AN ITEM USING ZOOM

- The Board President will call the item and staff will begin the staff report.
- Click on the Raise Hand icon if you would like to speak on the item.
- Your name will be called on when it's your turn to speak.
- When your name is called, you will be prompted to unmute yourself.
- When your time is up, you will be muted.
- You will repeat this process for each item you want to speak on.

FOR OPEN SESSION PARTICIPATION

Join Meeting Electronically at:

Join Zoom Meeting

https://us02web.zoom.us/j/85091655800?pwd=eERDYkk3Ky9pUlMzRHhwMS8yY0ZVdz09

Meeting ID: 850 9165 5800

Passcode: 253299

A G E N D A
REGULAR MEETING OF THE GOVERNING BOARD
OF THE GOLETA SANITARY DISTRICT
A PUBLIC AGENCY

One William Moffett Place
Goleta, California 93117

February 7, 2022

CALL TO ORDER: 6:30 p.m.

ROLL CALL OF MEMBERS

BOARD MEMBERS: Steven T. Majoewsky
George W. Emerson
Sharon Rose
Edward Fuller
Jerry D. Smith

CONSIDERATION OF THE MINUTES OF THE BOARD MEETING

The Board will consider approval of the Minutes of the Regular Meeting of January 17, 2022.

PUBLIC COMMENTS - Members of the public may address the Board on items within the jurisdiction of the Board.

POSTING OF AGENDA – The agenda notice for this meeting was posted at the main gate of the Goleta Sanitary District and on the District's web site 72 hours in advance of the meeting.

BUSINESS:

1. CONSIDERATION AND ADOPTION OF RESOLUTION CONTINUING THE CONDUCT OF MEETINGS UNDER MODIFIED BROWN ACT REQUIREMENTS
   (Board may take action on this item.)

2. STATUS REPORT ON TRANSITION TO DISTRICT-BASED ELECTIONS PROCESS

3. CONSIDERATION OF FUNDING REQUEST FROM THE SOUTHERN CALIFORNIA ALLIANCE OF PUBLICLY OWNED TREATMENT WORKS FOR ENHANCED REGULATORY ADVOCACY SUPPORT
   (Board may take action on this item.)

4. REVIEW AND CONSIDERATION OF PROPOSAL FOR PRELIMINARY ENGINEERING DESIGN SERVICES FOR BIOSOLIDS AND ENERGY STRATEGIC PLAN PHASES 2 & 3 IMPROVEMENTS
   (Board may take action on this item.)

5. GENERAL MANAGER'S REPORT

6. LEGAL COUNSEL'S REPORT

7. COMMITTEE/DIRECTOR'S REPORTS AND APPROVAL/RATIFICATION OF DIRECTOR'S ACTIVITIES

8. PRESIDENT'S REPORT

9. ITEMS FOR FUTURE MEETINGS

10. CORRESPONDENCE
    (The Board will consider correspondence received by and sent by the District since the last Board Meeting.)

11. APPROVAL OF BOARD COMPENSATION AND EXPENSES AND RATIFICATION OF CLAIMS PAID BY THE DISTRICT
    (The Board will be asked to ratify claims.)

ADJOURNMENT

Any public records which are distributed less than 72 hours prior to this meeting to all, or a majority of all, of the District's Board members in connection with any agenda item (other than closed sessions) will be available for public inspection at the time of such distribution at the District's office located at One William Moffett Place, Goleta, California 93117.

MINUTES

MINUTES
REGULAR MEETING OF THE GOVERNING BOARD
GOLETA SANITARY DISTRICT
A PUBLIC AGENCY
DISTRICT OFFICE CONFERENCE ROOM
ONE WILLIAM MOFFETT PLACE
GOLETA, CALIFORNIA 93117
(Held via Zoom)
January 17, 2022

CALL TO ORDER: President Majoewsky called the meeting to order at 6:30 p.m.

BOARD MEMBERS PRESENT: Steven T. Majoewsky, George W. Emerson, Sharon Rose, Edward Fuller, Jerry D. Smith

BOARD MEMBERS ABSENT: None

STAFF MEMBERS PRESENT: Steve Wagner, General Manager/District Engineer, Rob Mangus, Finance and Human Resources Manager/Board Secretary and Richard Battles, Legal Counsel from Howell Moore & Gough LLP.

OTHERS PRESENT: Larry Meyer, Director, Goleta West Sanitary District
Tom Evans, Director, Goleta Water District

APPROVAL OF MINUTES: Director Rose made a motion, seconded by Director Emerson, to approve the minutes of the Regular Board meeting of 01/03/22. The motion carried by the following vote:

(22/01/2278)

AYES:	5	Majoewsky, Emerson, Rose, Fuller, Smith
NOES:		None
ABSENT:		None
ABSTAIN:		None

POSTING OF AGENDA: The agenda notice for this meeting was posted at the main gate of the Goleta Sanitary District and on the District's website 72 hours in advance of the meeting.

PUBLIC COMMENTS: None

BUSINESS:

1. CONSIDERATION AND ACTION REGARDING GOLETA SANITARY DISTRICT STANDING COMMITTEES AND APPOINTMENT OF GOVERNING BOARD MEMBERS TO SERVE ON DISTRICT STANDING COMMITTEES
   Mr. Wagner gave the staff report.

Director Smith made a motion, seconded by Director Rose to keep the same Standing Committee assignments as approved last year, which are as follows:

	Engineering Committee	**Finance Committee**	**Personnel Committee**	**Outreach & Public Education Committee**
Member:	Majoewsky	Fuller	Majoewsky	Rose
Member:	Smith	Smith	Emerson	Fuller
Alternate:	Fuller	Rose	Smith	Emerson

The motion carried by the following vote:

(22/01/2279)

AYES:	5	Majoewsky, Emerson, Rose, Fuller, Smith
NOES:		None
ABSENT:		None
ABSTAIN:		None

2. CONSIDERATION AND ACTION REGARDING ATTENDANCE AT MEETINGS OF OUTSIDE AGENCIES BY GOVERNING BOARD MEMBERS

Mr. Wagner gave the staff report.

Director Rose made a motion, seconded by Director Smith to appoint Director Rose as representative to Goleta West Sanitary District and appoint Director Majoewsky as representative to Goleta Water District for the coming year.

The motion carried by the following vote:

(22/01/2280)

AYES:	5	Majoewsky, Emerson, Rose, Fuller, Smith
NOES:		None
ABSENT:		None
ABSTAIN:		None

Director Smith made a motion, seconded by Director Emerson to appoint Director Fuller as alternate representative to Goleta Water District and to appoint Director Smith as alternate representative to Goleta West Sanitary District for the coming year.

The motion carried by the following vote:

(22/01/2281)

AYES:	5	Majoewsky, Emerson, Rose, Fuller, Smith
NOES:		None
ABSENT:		None
ABSTAIN:		None

The outside agency assignments are as follows:

AGENCY	REPRESENTATIVE	ALTERNATE
Goleta Water District	Director Majoewsky	Director Fuller
Goleta West Sanitary District	Director Rose	Director Smith

3. CONSIDERATION AND ADOPTION OF RESOLUTION CONTINUING THE CONDUCT OF MEETINGS UNDER MODIFIED BROWN ACT REQUIREMENTS

Mr. Wagner gave the staff report.

Director Smith made a motion, seconded by Director Rose to approve and adopt Resolution No. 22-675 to continue to conduct meetings under modified Brown Act requirements.

The motion carried by the following vote:

(22/01/2282)

AYES:	5	Majoewsky, Emerson, Rose, Fuller, Smith
NOES:		None
ABSENT:		None
ABSTAIN:		None

4. STATUS REPORT ON 2021 ACTION PLAN

Mr. Wagner gave the staff report on this presentation item.
No Board action was taken.

5. CONSIDERATION OF RESOLUTION OF APPRECIATION FOR U.S. CONGRESSMAN SALUD CARBAJAL'S ONGOING SUPPORT OF SPECIAL DISTRICTS

Mr. Wagner gave the staff report.

Director Rose made a motion, seconded by Director Smith to approve and adopt Resolution No. 22-676 of appreciation for U.S. Congressman Carbajal's ongoing support of Special Districts.

The motion carried by the following vote:

(22/01/2283)

AYES:	5	Majoewsky, Emerson, Rose, Fuller, Smith
NOES:		None
ABSENT:		None
ABSTAIN:		None

6. GENERAL MANAGER'S REPORT
Mr. Wagner gave the report.

7. LEGAL COUNSEL'S REPORT
Mr. Battles reported that the CASA Attorneys Committee will meet via Zoom. He also reported on two different California court cases, the first regarding a Proposition 218 challenge and the issue of administrative remedies in which the court declined to infer that the plaintiff is required to appear at a public hearing to present their objection to an assessment. The second case was regarding a Public Records Act request. The court concluded in this case that the public records request was not overbroad or unduly burdensome.

8. COMMITTEE/DIRECTORS' REPORTS AND APPROVAL/RATIFICATION OF DIRECTORS' ACTIVITIES

Director Rose – No report.

Director Emerson – No report.

Director Fuller – Reported that his Goleta Water District report would be forthcoming.

Director Smith – No report.

9. PRESIDENT'S REPORT
President Majoewsky – Reported on his attendance at the Goleta West Sanitary District meeting via Zoom.

10. ITEMS FOR FUTURE MEETINGS
No Board action was taken to return with an item.

11. CORRESPONDENCE
The Board reviewed and discussed the list of correspondence to and from the District in the agenda.

12. APPROVAL OF BOARD COMPENSATION AND EXPENSES AND RATIFICATION OF CLAIMS PAID BY THE DISTRICT

Director Smith made a motion, seconded by Director Emerson, to ratify and approve the claims, for the period 12/20/21 to 01/17/22 as follows:

Running Expense Fund #4640	$	632,616.45
Capital Reserve Fund #4650	$	21,467.75
Depreciation Replacement Reserve Fund #4655	$	34,352.06
Retiree Health Insurance Sinking Fund #4660	$	11,499.75

The motion carried by the following vote:

(22/01/2284)

AYES:	5	Majoewsky, Emerson, Rose, Fuller, Smith
NOES:		None
ABSENT:		None
ABSTAIN:		None

ADJOURNMENT

There being no further business, the meeting was adjourned at 7:28 p.m.

Steven T. Majoewsky Governing Board President	Robert O. Mangus, Jr. Governing Board Secretary
George W. Emerson	Sharon Rose
Edward Fuller	Jerry D. Smith

AGENDA ITEM #1

AGENDA ITEM: 1

MEETING DATE: February 7, 2022

I. NATURE OF ITEM

Consideration and Adoption of Resolution Continuing the Conduct of Meetings Under Modified Brown Act Requirements

II. BACKGROUND INFORMATION

In 1953 the Ralph M. Brown Act (California Government Code Sections 54950-54963, commonly referred to as the Brown Act) was passed to guarantee the public's right to attend and participate in the meetings of local legislative bodies.

On March 19, 2020 California Governor Gavin Newsom issued a number of executive orders, including a stay-at-home order for the protection of the health and well-being of all Californians. To lessen the anticipated economic impact to workers who get sick, executive order N-25-20 was issued by Governor Newsom on March 12, 2020 mandating a number of measures, including temporarily loosening the requirements of the Brown Act that apply when local government entities (including the District) hold virtual remote meetings. Executive order N-08-21 rescinded those modifications to the Brown Act as of September 30, 2021.

On September 21, 2021 the Governor signed AB 361 into law, which allows local governments flexibility to conduct remote or hybrid in-person and remote meetings without some of the constraints of doing so under the Brown Act. The criteria were enumerated during the October 7, 2021 board meeting.

The adoption of the resolution permits meetings under the provisions of AB 361 for a maximum period of 30 days. On January 17, 2022 the Board adopted Resolution No. 22-675, extending the provisions of AB 361 until February 16, 2022. If a state of emergency remains active, a local agency may continue to hold meetings by teleconferencing under AB 361 by passing a subsequent resolution by majority vote finding that (i) the Board has reconsidered the circumstances of the state of emergency, and (ii) any of the following circumstances exist:

- The state of emergency continues to directly impact the ability of the members to meet safely in person.
- State or local officials continue to impose or recommend measures to promote social distancing.

The Santa Barbara County Health Department's requirement to wear masks indoors and the recommendation to maintain social distancing is currently in

place through March 4, 2022, at which time the Health Department will evaluate whether or not to extend the indoor mask order and social distancing measures.

AB 361 will sunset on January 1, 2024 if no changes have been made, or if it has not been extended or made permanent.

III. COMMENTS AND RECOMMENDATIONS

The Board should consider if it wishes to maintain the ability to continue to meet remotely by teleconference, or hold hybrid meetings under AB 361. If not, then no action is required at this time, in which case Resolution No. 22-675 will expire on February 17, 2022 and holding of meetings by teleconferencing will be subject to the more restrictive Brown Act requirements that predate AB 361. If the Board desires to have the option to continue to meet remotely due to the ongoing COVID-19 emergency, staff recommends the Board adopt Resolution No. 22-677 pursuant to AB 361 as described herein. The new resolution will allow the District to meet under the AB 361 requirements through March 8, 2022.

IV. REFERENCE MATERIALS

Resolution No. 22-677

RESOLUTION NO. 22-677

A RESOLUTION OF THE GOVERNING BOARD OF THE GOLETA SANITARY DISTRICT AUTHORIZING CONTINUATION OF REMOTE TELECONFERENCE MEETINGS OF THE DISTRICT'S LEGISLATIVE BODIES PURSUANT TO GOVERNMENT CODE SECTION 54953(e) FOR THE PERIOD FEBRUARY 7, 2022 TO MARCH 8, 2022

WHEREAS, all meetings the Goleta Sanitary District's Governing Board, standing committees, and other legislative bodies are open and public, as required by the Ralph M. Brown Act (Cal. Gov. Code 54950 – 54963), so that any member of the public may attend, participate, and watch the District's legislative bodies conduct their business; and

WHEREAS, Government Code section 54953(e) makes provisions for meetings to be conducted by remote teleconferencing without compliance with the requirements of Government Code section 54953(b)(3), subject to the existence of certain conditions; and

WHEREAS, a required condition for conducting meetings using teleconferencing under Government Code section 54953(e) is that a state of emergency has been declared by the Governor pursuant to Government Code section 8625; and

WHEREAS, it is further required as a condition for conducting meetings using teleconferencing under Government Code section 54953(e) that (i) state or local officials have imposed or recommended measures to promote social distancing, or (ii) meeting in person would present imminent risks to the health and safety of attendees; and

WHEREAS, the Governing Board adopted Resolution No. 21-669 on October 7, 2021 finding that the requisite conditions existed for the Governing Board and other legislative bodies of the Goleta Sanitary District to conduct remote teleconference meetings without compliance with Government Code section 54953(b)(3); and

WHEREAS, the Governing Board adopted Resolution No. 21-670 on November 1, 2021 finding that the requisite conditions existed for the Governing Board and other legislative bodies of the Goleta Sanitary District to conduct remote teleconference meetings without compliance with Government Code section 54953(b)(3); and

WHEREAS, the Governing Board adopted Resolution No. 21-671 on November 20, 2021 finding that the requisite conditions existed for the Governing Board and other legislative bodies of the Goleta Sanitary District to conduct remote teleconference meetings without compliance with Government Code section 54953(b)(3); and

WHEREAS, the Governing Board adopted Resolution No. 21-674 on December 20, 2021 finding that the requisite conditions existed for the Governing Board and other legislative bodies of the Goleta Sanitary District to conduct remote teleconference meetings without compliance with Government Code section 54953(b)(3); and

WHEREAS, the Governing Board adopted Resolution No. 22-675 on January 17, 2022 finding that the requisite conditions existed for the Governing Board and other legislative bodies of the Goleta Sanitary District to conduct remote teleconference meetings without compliance with Government Code section 54953(b)(3); and

WHEREAS, as a condition of extending the use of the provisions found in Government Code section 54953(e), the Governing Board must find that (i) it has reconsidered the circumstances of the state of emergency, and (ii) any of the following circumstances exist:

- The state of emergency continues to directly impact the ability of the members to meet safely in person.
- State or local officials continue to impose or recommend measures to promote social distancing; and

WHEREAS, the state of emergency that was declared by Governor Newsom on March 4, 2020 due to COVID-19 remains active and in effect as of the date of this Resolution; and

WHEREAS, local officials continue to impose or recommend measures to promote social distancing in that, on September 28, 2021, the Santa Barbara County Health Department issued a document entitled "Health Officials AB 361 Social Distance Recommendation" which remains in effect as of the date of this Resolution and which states, in part, as follows:

> Using teleconferencing options for public meetings in an effective and recommended social distancing measure to facilitate public participation in public affairs and encourage participants to protect themselves and others from the COVID-19 disease. This recommendation is further intended to satisfy the requirement of the Brown Act (specifically Gov't Code Section 54953(e)(1)(A)), which allows legislative bodies in the County of Santa Barbara to use certain available teleconferencing options set forth in the Brown Act.

NOW, THEREFORE, IT IS HEREBY RESOLVED by the Governing Board of the Goleta Sanitary District, as follows:

1. Findings. The Governing Board hereby finds that (i) it has reconsidered the circumstances of the state of emergency declared by Governor Newsom on March 4, 2020 and has determined that such state of emergency remains active, (ii) local officials continue to impose or recommend measures to promote social distancing, and (iii) the legislative bodies of the District are authorized to continue conducting meetings using teleconferencing under Government Code section 54953(e) without compliance with Government Code section 54953(b)(3).

2. Remote Teleconference Meetings. The General Manager and staff of the District are hereby authorized and directed to take all actions necessary to carry out the intent and purpose of this Resolution including, continuing to conduct open and public meetings in accordance with Government Code section 54953(e) and other applicable provisions of the Brown Act.

3. **Public Access.** The legislative bodies of the District shall comply with the requirements to provide the public with access to meetings as prescribed in Government Code Section 54953(e)(2).

4. **Effective Date of Resolution.** This Resolution shall take effect on February 7, 2022, and shall expire on March 8, 2022 unless, on or before that date and every thirty (30) days thereafter, the Governing Board adopts a subsequent resolution setting forth the findings required by Government Code Section 54953(e)(3) to extend the time during which the legislative bodies of the District may continue to teleconference without compliance with Government Code Section 54953(b)(3).

PASSED AND ADOPTED this 7th day of February, 2022, by the following vote of the Governing Board of the Goleta Sanitary District:

AYES:

NOES:

ABSENT:

ABSTAIN:

_____
Steven T. Majoewsky
President of the Governing Board

Countersigned:

_____
Robert O. Mangus, Jr.,
Secretary of the Governing Board

AGENDA ITEM #2

AGENDA ITEM: 2

MEETING DATE: February 7, 2022

I. NATURE OF ITEM

Status Report on Transition to District-Based Elections Process

II. BACKGROUND INFORMATION

On August 20, 2018, the Board adopted Resolution No.18-637 declaring their intent to transition from at-large elections to district-based elections in accordance with the California Voting Rights Act (CVRA) for the November 2022 General Election, following the completion and receipt of the data from the 2020 Census. On July 6, 2020 the Board approved an agreement with Lapkoff and Gobalet for demographic services to assist in creating the new voting district maps pursuant to the CVRA.

A number of outreach activities must take place before the new voting district maps can be finalized. These activities include, but are not limited to the following:

1. Conducting public outreach, including to non-English-speaking communities to explain the districting process and to encourage public participation.
2. Holding two public hearings to gather input before draft voting district maps are prepared.
3. Holding two additional public hearings after draft voting district maps have been prepared for additional public feedback.
4. Publicizing the above public hearings in advance (on the District's website, social media, in press releases, posted in the community).
5. Holding a public meeting on the proposed voting district maps for approval.
6. Submitting the approved final version of the voting district maps to the County's Office of Elections.

The first of two public hearings were held via Zoom on November 1, 2021 and November 20, 2021. The second round of public hearings to review draft maps and provide input will take place on Saturday, March 5, 2022 at 3:00 p.m. and Monday, March 21, 2022 at 6:30 p.m. at the District's Boardroom and virtually via Zoom. An interpreter will be available to assist with anyone desiring Spanish-language interpretation. Recorded versions of the meetings in English and Spanish will also be posted to the District's website.

Advertisement via print and digital media, social media posts, radio advertising, a mailed flyer, and updates to the District's website are all scheduled to take place before the first meeting in March.

The first set of draft voting district maps have been submitted for review and can be viewed on the District's website. The above referenced outreach efforts will include links to the draft maps and instructions on how to submit comments.

III. COMMENTS AND RECOMMENDATIONS

This report is for informational purposes only. As such, no Board action is required at this time.

IV. REFERENCE MATERIALS

Schedule of Public Outreach Activities Planned for the Transition to District-Based Elections

GOLETA SANITARY
Water Resource Recovery District

Transition to District-Based Elections
Outreach Plan 1/12/2022

Date	Activity Description
Jan. 2022	**Preliminary voting district maps prepared by demographers based on census data.**
Jan. 2022	**Draft voting district map(s) published (website, Facebook, posted in community).**
Feb. 2022	**Press release, social media posts, web updated regarding 2nd round of public hearings on draft voting district maps**
Feb. 2022	**Flyer is mailed to all residents of the District, radio and print ads, social media posts, website is updated.**
March 2022	**Proposed Second round of public hearings (2) are held to gather input on proposed voting district maps. Social media posts, last week of print and radio ads.**
March 2022	**Board considers proposed map(s) based on comments re. communities of interest, and public and Board comments.**
March-April 2022	**Press release, social media posts, web updated regarding public hearing on adoption of proposed voting district map.**
April 2022	**Proposed public hearing to adopt proposed voting district map and institute district-based elections.**
April 2022	**Adopted map is published on website, social media**
April 2022	**Press release on final adopted map**
April 2022	**Adopted voting district map files are sent to County of Santa Barbara for November election**
June 2022	**Summer newsletter with story regarding new district voting boundaries**
Nov. 2022	**Election based on adopted voting districts for GSD Board member candidates**

AGENDA ITEM #3

AGENDA ITEM: 3

MEETING DATE: February 7, 2022

I. NATURE OF ITEM

Consideration of Funding Request from the Southern California Alliance of Publicly Owned Treatment Works for Enhanced Regulatory Advocacy Support

II. BACKGROUND INFORMATION

The Southern California Alliance of Publicly Owned Treatment Works (SCAP) is a non-profit corporation organized to help ensure that regulations affecting waste water agencies are reasonable and in the public's best interest. SCAP is currently comprised of over 80 wastewater treatment and collection system agencies that together collect and/or treat wastewater for over 18 million southern Californians in seven counties. The District is a founding member of SCAP and has been actively involved since its inception.

Although its attention is directed mainly towards the regulatory arena, SCAP also works on legislation that would similarly impact its members. In extreme situations, litigation may be pursued when SCAP members feel it is in the best interest of the public to challenge proposed or existing laws or regulations. Over the years SCAP has helped pay for litigation efforts on behalf of individual member agencies through funds donated by other member agencies that were not directly involved in the litigation.

In May 2021 the District responded to a SCAP funding request and contributed money towards the ongoing litigation associated with the United States Environmental Protection Agency's (USEPA) use of an unapproved Test of Significant Toxicity.

In the fall of 2021 SCAP's Air Quality (AQ) Committee reported how proposed changes to AQ regulations related to fleet electrification mandates could significantly impact Publicly Owned Treatment Works (PTOWs) across the state. Attached to this report is a letter from SCAP summarizing some of the proposed regulatory changes and associated impacts. While the California Association of Sanitation Agencies (CASA) is actively opposing the proposed regulatory changes, they don't have the resources required to keep up with all the regulatory changes being proposed that would impact POTWs. As such, SCAP's letter includes a funding request to help enhance CASA's air quality advocacy efforts adding additional advocacy staffing resources.

III. COMMENTS AND DISCUSSION

If the above referenced changes to the AQ regulations are implemented and fleet electrification is mandated as proposed, the exact financial impact to the District is unknown, but would likely be significant. Fleet electrification alone could cost our District over a million dollars. And what about our diesel generators that generate electricity during a power outage? How would we electrify those and at what cost?

SCAP is looking to raise $150,000 a year for 2 years. For smaller agencies like ours, the cost share of this fundraising effort is $5,000 a year for 2 years. Given the potential costs associated with the proposed changes if implemented, contributing the amount requested seems like a good investment. As such, staff recommends the Board consider authorizing the payment of $5,000 per year for 2 years to SCAP for this effort as requested.

IV. REFERENCE MATERIAL

SCAP Funding Request letter dated January 11, 2022

SCAP
SOUTHERN CALIFORNIA ALLIANCE OF PUBLICLY OWNED TREATMENT WORKS

REUSE
BRINGING WATER FULL CIRCLE
WASTE
TREATMENT

January 11, 2022

Re: Funding Request to Enhance CASA's Climate/Air Quality/Energy Advocacy

Dear Southern California Utility Managers:

We are at a critical point with wastewater sector advocacy needs on air quality, climate and energy regulations that if not changed will have a significant impact on our sector. Since the majority of these are Statewide policies, SCAP has been working in a supporting role closely with CASA. To be more effective we need to provide CASA with more resources. Please see the attached proposal from LACSD to enhance CASA's climate/air quality/energy advocacy resources.

We anticipate this to be a two-year campaign and are suggesting the following contribution levels:

- Large agency: $25,000 per year for two years
- Small agency: $5,000 per year for two years

LACSD will be contributing at the $25,000 per year level.

The minimum funding goal is $150,000 per year for two years. The $150,000 amount includes $100,000 for technical advocacy from Sarah Deslauriers and the Carollo team and $50,000 for a lobbyist to assist with getting access to CARB policy makers and California lawmakers (see attached enhanced scope of work from Carollo). CASA is currently attempting to identify potential lobbyists and will provide additional information to SCAP before retaining any lobbyists. SCAP will provide status reports of the funds raised to the SCAP Board and contributing agencies in February and March of 2022. If funding commitments exceed the $150,000 goal, surplus funding will be dedicated to year two, or if needed and with permission of the donors, used to improve and enhance the advocacy efforts.

To provide a greater understanding of the issues we are facing, David Rothbart, LACSD and SCAP Air Quality Committee Chair, will be providing a virtual presentation on these air quality challenges on Thursday, January 27 from 1:30 pm to 2:30 pm. Please note that this is the same presentation that was provided to the SCAP Board on December 2nd. The presentation is

P.O Box 231565
Encinitas, CA 92024

email: info@scap1.org
phone: 760.415.4332

SCAP
SOUTHERN CALIFORNIA ALLIANCE OF PUBLICLY OWNED TREATMENT WORKS

REUSE
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WASTE
TREATMENT

approximately 20 minutes long and will be followed by a question and answer period. The presentation will be recorded, and a link will be provided for future viewing.

Join Zoom Meeting
https://us02web.zoom.us/j/3791213334

Meeting ID: 379 121 3334
Passcode: SCAP
One tap mobile
+16699009128,,3791213334#,,,,*795524# US (San Jose)
+12532158782,,3791213334#,,,,*795524# US (Tacoma)

Dial by your location
+1 669 900 9128 US (San Jose)
+1 253 215 8782 US (Tacoma)
+1 346 248 7799 US (Houston)
+1 301 715 8592 US (Washington DC)
+1 312 626 6799 US (Chicago)
+1 646 558 8656 US (New York)
Meeting ID: 379 121 3334
Passcode: 795524

Please contact SCAP with the amount your agency is able to contribute and SCAP will follow up with an invoice. SCAP will collect the funds and distribute to CASA. We request a response by February 18, 2022 or sooner.

This request is also being made to the Bay Area Clean Water Agencies (BACWA) Board and select larger agencies in the Central Valley Area.

If there are any questions, please feel free to contact me or David.

Steve Jepsen, SCAP - Executive Director
sjepsen@scap1.org 760.415.4332

David Rothbart, LACSD - SCAP Air Quality Committee Chair
drothbart@lacsd.org 562-908-4288 ext. 2412

SCAP
SOUTHERN CALIFORNIA ALLIANCE OF PUBLICLY OWNED TREATMENT WORKS

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TREATMENT

Sincerely,

Steve Jepsen

Executive Director - SCAP

Attachments

- LACSD Proposal to Enhance CASA's Climate/Air Quality/Energy Advocacy
- Carollo Scope of Work

P.O Box 231565
Encinitas, CA 92024

email: info@scap1.org
phone: 760.415.4332

Proposal to Enhance CASA's Climate/Air Quality/Energy Advocacy

The Los Angeles County Sanitation Districts (Sanitation Districts) are reaching out to fellow wastewater agencies to request your consideration of contributing additional resources to support CASA's advocacy efforts related to climate, air quality and energy. In recent years there has been an unprecedented surge in regulatory activity pertaining to emissions, energy and climate change issues that impacts wastewater facilities, and this is only expected to intensify in the next few years. CASA staff have done an exceptional job managing these issues and providing the wastewater perspective in important forums, but resources are stretched thin and additional funding is needed to effectively engage with regulatory policymakers to ensure that CASA members can maximize our efforts to anaerobically digest food waste and produce biogas as a renewable resource in support of achieving the State's efforts to achieve the methane reduction goals of SB 1383.

CASA staff and members have been working hard to advocate for beneficial policies that span several different proposed California Air Resources Board (CARB) regulations, California Energy Commission policies and programs, and the California Public Utilities Commission proceedings. The combined efforts of these regulatory agencies are focused on achieving full electrification of the mobile source sector (e.g., Advanced Clean Fleets, Mobile Source Strategy, Scoping Plan Update, 2022 State SIP Strategy, Small Off-Road Engines (SORE) & Tier 5 Off-Road Diesel Emission Standards), and aim to achieve statewide carbon neutrality by 2035, 10 years ahead of the original goal to achieve this by 2045. For example, as drafted, CARB's Advanced Clean Fleets – Public Fleet Requirements and other proposed regulations would require new vehicle purchases, including heavy-duty vehicles utilized by wastewater agencies, to be electric commencing in 2024. Other initiatives represent competing and conflicting priorities among regulatory agencies (e.g. organics diversion mandates under CalRecycle regulations promote increased acceptance of food waste at POTWs, but CARB regulations subjecting those very facilities to increasingly strict emissions rules end up disincentivizing the effort).

Additional climate change policies and strategies that affect CASA members are being developed and implemented by agencies that include CalRecycle, the State and Regional Water Boards, the California Coastal Commission, California Department of Food and Agriculture, and the California Environmental Protection and Natural Resources Agencies. In short, we are in a time with an unprecedented level of regulatory activity, much of which is focused on achievement of the State's ambitious climate change goals. If we do not actively and quickly engage regulatory agencies at a high level and encourage them to pursue a more cohesive approach to addressing the wastewater sector, we may miss important opportunities to ensure that CASA members can meet both the challenges and opportunities presented during this period.

Although CASA has staff and a part-time consultant dedicated to these programs, we believe these staff are stretched extremely thin and additional resources are needed to help CASA achieve the best results possible in this unique window. We propose to work with CASA's Board and staff to determine the need and willingness of member agencies to contribute funding on a temporary basis to meet this important challenge through possible staff, consulting and advocacy enhancements.

Engineers...Working Wonders With Water®

2795 Mitchell Drive, Walnut Creek, California 94598-1601
P. 925.932.1710

January 11, 2022

Mr. Adam Link
925 L Street, Suite 200
Sacramento, CA 95814
e-mail submittal: alink@casaweb.org

Subject: Scope of services and budget for providing CASA's Air Quality, Climate Change, and Energy Workgroup an enhanced level of support for calendar years 2022 and 2023

Dear Mr. Link:

Thank you for requesting a scope of services and budget to provide an enhanced level of support to CASA's Air Quality, Climate Change, and Energy (ACE) Workgroup over the next two calendar years (2022 and 2023). As requested, Carollo Engineers (CONSULTANT) is submitting the following proposed scope of services and supporting budgets for consideration.

SCOPE OF SERVICES

The Scope of Services as summarized in tasks below was originally developed for performing typical year-to-year activities in support of CASA's ACE Workgroup. However, over the next two years there is a significant increase in demand for support to adequately respond to the California Air Resources Board's (CARB's) developing vehicle electrification regulations and their subsequent implementation, as well as a higher level of simultaneous administrative activity on climate, air quality and energy issues underway by other regulatory agencies than previously anticipated. The significance of these developing regulations is compounded by the fact that they threaten the implementation of other programs critical to achieving short-lived climate pollutant reduction via WWTPs and the wastewater sector's overall resilience during power outages (which is unacceptable as an essential public service provider vital to life and health).

While the high-level task descriptions remain the same, it is estimated that an additional $100,000 is needed at minimum for each calendar year (2022 and 2023) to provide the needed enhanced level of coordination, verbal and written responses, engagement in public workshops and hearings, and outreach to state agency staff, executives, and board members. Table 1 shows the originally estimated level of effort for fiscal year 2021-2022, and Tables 2 and 3 show the estimated increase in budget ($100,000) and related level of effort for responding to the quickly developing electrification regulations in calendar years 2022 and 2023, respectively – this translates to an approximate 80% increase in hours of Carollo staff support. Carollo will provide support services for the Program Manager (Sarah Deslauriers) as needed at a lower billing rate to optimize the contract budget. Types of support services may include administrative, technician, analyst, graphics, etc. In addition, the existing coordination of activities with CASA staff under the current agreement, particularly CONSULTANT's work with CASA's Director of Renewable Resource Programs and ACE programs, will continue in a similar manner under the expanded agreement.

TASK 1 – MEETINGS

CONSULTANT will plan, organize, and lead monthly webinar/conference calls in conjunction with CASA's ACE Workgroup. To the extent needed, in-person meetings will be coordinated with video conferencing made available as appropriate in Carollo offices. Frequency of meetings and calls are flexible at the direction of the CONSULTANT, CASA, and with input from the ACE Workgroup and project funders.

TASK 2 – ISSUE REVIEW AND COMMUNICATIONS

CONSULTANT will monitor regulatory agencies that develop climate change, air quality, and applicable energy regulations, in conjunction with CASA, that may affect POTWs including, but not limited to the California State Air Resources Board (CARB), the State Water Resources Control Board (SWRCB), the California Energy Commission (CEC), the California Public Utilities Commission (CPUC), the California Natural Resources Agency (CNRA), CalRecycle, Local Air Management Districts, and the U.S. Environmental Protection Agency (US EPA). The CONSULTANT is expected to interact with pertinent agencies, including meeting with agency staff, participating in key workshops and hearings, and drafting correspondence. Issues the CONSULTANT is anticipated to track, review, analyze, and participate in during FY 2021-2022 include, but may not be limited to:

- Informing the CARB and local Air District staff on liquids treatment in CA - with the purpose of educating staff on the variability of nitrous oxide and other process emissions.
- CARB Climate Change Scoping Plan Update and related developments.
  - CNRA Natural and Working Lands Climate Smart Strategy.
  - CARB Advanced Clean Vehicles Regulations.
  - CEC, CPUC, and CARB Clean and Renewable Electricity under SB 100.
  - Continuing work with CARB, CalRecycle, and the State Water Resources Control Board (SWRCB) staff on regulatory development and implementation of Short-Lived Climate Pollutant Reduction Strategies under SB 1383 regulations.
  - Tracking and responding to Environmental Justice Advisory Committee developments.
- Continuing work with CARB, CalRecycle, and SWRCB staff on establishing funding allocations out of the Cap-and-Trade Greenhouse Gas (GHG) Reduction Fund to wastewater projects.
- California Adaptation
  - CNRA Fourth Adaptation Strategy Update.
  - Climate change adaptation assessments and measures as they relate to permit requirements (including State Water Board, Regional Water Board and Coastal Commission activities).
- Tracking and facilitating efforts related to updates to AB 2588 Air Toxics "Hot Spots" Emission Inventory Criteria and Guidelines (EICG) and the Reporting of Criteria Air Pollutants and Toxic Air Contaminants (CTR) under AB 617 to CARB and local AQMDs.
- New Best Available Control Technology (BACT) for emergency standby diesel engines in specified local air districts.
- Coordinating regional/local air district issues with state-level issues.
- Continuing to track and engage in discussions or comments on the following as necessary:
  - State legislation
  - CNRA online sea level rise database
  - CARB Mandatory GHG Reporting and Cap-and-Trade Regulations updates
  - EPA Mandatory Reporting Regulation updates
  - EPA Clean Power Plan updates
  - EPA Existing Source Performance Standards updates
  - EPA Biogenic Emissions Accounting Framework updates
  - White House Budget for Energy Efficiency and Renewable Energy Programs
  - NACWA Energy Workgroup
  - NACWA Climate & Resilience Committee

- NEPA Guidance on GHG Emissions
- CEQA Guidance on GHG Emissions
- CEC Climate Change Research Plan updates
- CalEnvironScreen Tool / EPA EJScreen Tool
- Other funding opportunities

TASK 3 - COORDINATION ACROSS WATER SECTOR ORGANIZATIONS

The CONSULTANT will coordinate with POTW and other water sector organizations on issues of mutual interest. The purpose of this coordination will be to share useful information, identify areas of joint cooperation, and prepare common responses on key issues, where technically appropriate. POTW organizations include but are not limited to the California Water Environment Association (CWEA), Bay Area Clean Water Agencies (BACWA), Southern California Alliance of POTWs (SCAP), Central Valley Clean Water Association (CVCWA), Water Environment Federation (WEF), Water Research Foundation (WRF), League of California Cities, and National Association of Clean Water Agencies (NACWA). Activities may include periodic conference calls, meetings, and exchange of draft or published materials.

CONSULTANT will also coordinate with and disseminate information to members. This may include email communications, presentations at conferences and workshops hosted by the member associations, and participation in meetings of the Clean Water Summit Partners.

Under this task, the CONSULTANT will also respond on an as-needed basis to questions from individual members.

TASK 4 – OTHER DUTIES AS ASSIGNED

The CONSULTANT will perform work under this task as directed by the CASA Executive Director or other CASA staff in consultation with the Executive Director. Duties may include limited involvement in legislative activities or other specialized services required on an ad-hoc basis.

Table 1. Estimated 2021-2022 Budget before Budget Enhancement to Respond to Proposed Electrification Regulations
Climate Change Program Manager (Air Quality, Climate Change, and Energy Workgroup Lead)
California Association of Sanitation Agencies

Task	TASK DESCRIPTION	CAROLLO TEAM LABOR HOURS					Total Estimated Costs
		PM	PP	AP	Total Labor Hours	Total Labor Costs	
1.0	**Meetings**	72	0	0	72	$16,992	$16,992
	Task 1 - Subtotal	**72**	**0**	**0**	**72**	**$16,992**	**$16,992**
2.0	**Issue Review and Communications**						
2.1	Legislative Bill Review & Input	40	0	0	40	$9,440	$9,440
2.2	2022 Scoping Plan Update	240	0	0	240	$56,640	$56,640
2.2.1	Natural & Working Lands Climate Smart Strategy						
2.2.2	Advanced Clean Vehicles Regulations						
2.2.3	Clean and Renewable Electricity (SB 100)						
2.2.4	Short-Lived Climate Pollutant Reduction (SB 1383)						
2.2.5	CARB/EJAC Engagement						
2.3	Can-and-Trade Investment Plan	8	0	0	8	$1,888	$1,888
2.4	California Adaptation	40	0	0	40	$9,440	$9,440
2.4.1	CCC Critical Infrastructure SLR Planning Guidance (coordinate SWRCB & OPC)						
2.4.2	Fourth Adaptation Strategy Update						
2.4.3	SWRCB Climate Change Preparedness Survey						
2.5	Air Toxics Statewide Two-Step Process	40	0	0	40	$9,440	$9,440
2.5.1	CARB Staff Engagement/Scope Development						
2.5.2	Participating Agency Identification/Governance Structure						
2.5.3	RFP Support/Coordination						
2.6	BACT Development/Engagement	24	0	0	24	$5,664	$5,664
2.7	Regional Air District Issue Coordination with State-Level Issues	20	0	0	20	$4,720	$4,720
	Task 2 - Subtotal	**280**	**0**	**0**	**280**	**$66,080**	**$66,080**
3.0	**Coordination with CASA Staff and Across Water Sector Organizations**	40	0	0	40	$9,440	$9,440
	Task 3 - Subtotal	**40**	**0**	**0**	**40**	**$9,440**	**$9,440**
4.0	**Other Duties as Assigned (as directed by Executive Director)**	0	0	0	0	$0	$0
	Task 4 - Subtotal	**0**	**0**	**0**	**0**	**$0**	**$0**
	SUBTOTAL	**524**	**0**	**0**	**524**	**$123,664**	**$123,664**
	Hourly Rate	**$236**	**$280**	**$193**			

Legend:

PM	Program Manager
PP	Project Professional
AP	Assistant Professional

Table 2. Proposed 2022 Budget to Respond to Proposed Electrification Regulations
Climate Change Program Manager (Air Quality, Climate Change, and Energy Workgroup Lead)
California Association of Sanitation Agencies

Task	TASK DESCRIPTION	CAROLLO TEAM LABOR HOURS					Total Estimated Costs
		PM	PP	AP	Total Labor Hours	Total Labor Costs	
1.0	**Meetings**	72	0	0	72	$16,992	$16,992
	Task 1 - Subtotal	**72**	**0**	**0**	**72**	**$16,992**	**$16,992**
2.0	**Issue Review and Communications**						
2.1	Legislative Bill Review & Input	40	0	0	40	$9,440	$9,440
2.2	2022 Scoping Plan Update	432	0	160	592	$132,832	$132,832
2.2.1	Natural & Working Lands Climate Smart Strategy						
2.2.2	Advanced Clean Vehicles Regulations						
2.2.3	Clean and Renewable Electricity (SB 100)						
2.2.4	Short-Lived Climate Pollutant Reduction (SB 1383)						
2.2.5	CARB/EJAC Engagement						
2.3	Can-and-Trade Investment Plan	8	0	0	8	$1,888	$1,888
2.4	California Adaptation	40	0	0	40	$9,440	$9,440
2.4.1	CCC Critical Infrastructure SLR Planning Guidance (coordinate SWRCB & OPC)						
2.4.2	Fourth Adaptation Strategy Update						
2.4.3	SWRCB Climate Change Preparedness Survey						
2.5	Air Toxics Statewide Two-Step Process	64	0	0	64	$15,104	$15,104
2.5.1	CARB Staff Engagement/Scope Development						
2.5.2	Participating Agency Identification/Governance Structure						
2.5.3	RFP Support/Coordination						
2.6	BACT Development/Engagement	24	0	0	24	$5,664	$5,664
2.7	Regional Air District Issue Coordination with State-Level Issues	64	0	0	64	$15,104	$15,104
	Task 2 - Subtotal	**472**	**0**	**160**	**632**	**$142,272**	**$142,272**
3.0	**Coordination with CASA Staff and Across Water Sector Organizations**	72	0	0	72	$16,992	$16,992
	Task 3 - Subtotal	**72**	**0**	**0**	**72**	**$16,992**	**$16,992**
4.0	**Other Duties as Assigned (as directed by Executive Director)**	0	0	0	0	$0	$0
	Task 4 - Subtotal	**0**	**0**	**0**	**0**	**$0**	**$0**
	SUBTOTAL	**816**	**0**	**160**	**976**	**$223,456**	**$223,456**
	Hourly Rate	**$236**	**$280**	**$193**			

Legend:
PM Program Manager
PP Project Professional
AP Assistant Professional

Table 3. Proposed 2023 Budget to Respond to Proposed Electrification Regulations
Climate Change Program Manager (Air Quality, Climate Change, and Energy Workgroup Lead)
California Association of Sanitation Agencies

Task	TASK DESCRIPTION	CAROLLO TEAM LABOR HOURS					
		PM	PP	AP	Total Labor Hours	Total Labor Costs	Total Estimated Costs
1.0	**Meetings**	72	0	0	72	$17,502	$17,502
	Task 1 - Subtotal	**72**	**0**	**0**	**72**	**$17,502**	**$17,502**
2.0	**Issue Review and Communications**						
2.1	Legislative Bill Review & Input	40	0	0	40	$9,723	$9,723
2.2	2022 Scoping Plan Update (continued regulatory development)	400	0	160	560	$129,038	$129,038
2.2.1	Natural & Working Lands Climate Smart Strategy						
2.2.2	Advanced Clean Vehicles Regulations						
2.2.3	Clean and Renewable Electricity (SB 100)						
2.2.4	Short-Lived Climate Pollutant Reduction (SB 1383)						
2.2.5	CARB/EJAC Engagement						
2.3	Can-and-Trade Investment Plan	8	0	0	8	$1,945	$1,945
2.4	California Adaptation	40	0	0	40	$9,723	$9,723
2.4.1	CCC Critical Infrastructure SLR Planning Guidance (coordinate SWRCB & OPC)						
2.4.2	Fourth Adaptation Strategy Update						
2.4.3	SWRCB Climate Change Preparedness Survey						
2.5	Air Toxics Statewide Two-Step Process	64	0	0	64	$15,557	$15,557
2.5.1	CARB Staff Engagement/Scope Development						
2.5.2	Participating Agency Identification/Governance Structure						
2.5.3	RFP Support/Coordination						
2.6	BACT Development/Engagement	24	0	0	24	$5,834	$5,834
2.7	Regional Air District Issue Coordination with State-Level Issues	64	0	0	64	$15,557	$15,557
	Task 2 - Subtotal	**440**	**0**	**160**	**600**	**$138,762**	**$138,762**
3.0	**Coordination with CASA Staff and Across Water Sector Organizations**	72	0	0	72	$17,502	$17,502
	Task 3 - Subtotal	**72**	**0**	**0**	**72**	**$17,502**	**$17,502**
4.0	**Other Duties as Assigned (as directed by Executive Director)**	0	0	0	0	$0	$0
	Task 4 - Subtotal	**0**	**0**	**0**	**0**	**$0**	**$0**
	SUBTOTAL	**784**	**0**	**160**	**944**	**$222,381**	**$222,381**
	Hourly Rate	**$243**	**$288**	**$199**			

Legend:
PM Program Manager
PP Project Professional
AP Assistant Professional

We appreciate your consideration on this scope of services and budget and look forward to working more closely with you and your staff. Please do not hesitate to contact us if you have any questions or require additional information.

Sincerely,

CAROLLO ENGINEERS, INC.

Sarah Deslauriers, PE, ENV SP
Vice President
sdeslauriers@carollo.com
M 925-705-6404

AGENDA ITEM #4

AGENDA ITEM: 4

MEETING DATE: February 7, 2022

I. NATURE OF ITEM

Review and Consideration of Proposal for Preliminary Engineering Design Services for Biosolids and Energy Strategic Plan Phases 2 & 3 Improvements

II. BACKGROUND INFORMATION

Over the last several years, the District has worked with Hazen and Sawyer Inc. (Hazen) to develop and implement a Biosolids and Energy Strategic Plan (BESP). The goal of the BESP was to determine the most appropriate combination of biosolids treatment, disposal and energy recovery improvements that once implemented would help the District achieve its vision of long term energy stainability.

The Board adopted the final BESP on September 3, 2019. An excerpt from BESP executive summary showing the recommended improvements and implementation timing is attached to this report.

The final list of recommended BESP improvements were grouped into the following 3 phases:

1. Install a new digester to resolve firm capacity issue and install 1st phase of a CHP system to convert the existing biogas to energy.
2. Install a high strength waste receiving station to increase biogas production and install 2nd phase of CHP system to convert additional biogas to energy
3. Install a thermal dryer to produce class A biosolids and reduce hauling costs

Since adoption of the BESP in 2019, staff has been working closely with the Hazen team to complete the design and environmental review of the Phase 1 Improvement Project and put it out to bid. The design is now nearing completion and the project is scheduled to go out to construction in 2023 once all regulatory permits are obtained.

As originally envisioned, Phase 2 of the BESP was to be implemented approximately 4 years after Phase 1 and Phase 3 would follow some 3 -7 years after Phase 2 depending on market conditions.

However, recent financial analysis of Phases 2 and 3 of the BESP has shown that combining the 2 phases into 1 project and accelerating their start could have a significant positive economic impact to the District in terms of reduced overall

project costs and operational cost savings. The attached proforma shows how accelerating completion of Phases 2 and 3 could save the District over $11M in project and operational costs.

The typical timelines for delivery of a major capital improvement project using a traditional design, bid, and build method can take 3-5 years depending on the permit and environmental review process required. Other alternative forms of project delivery such as design build methods using an Energy Service Company (ESCO) pursuant to Government Code 4217, or Construction Manager At Risk (CMAR) can significantly reduce the project timeline and each has certain advantages and disadvantages related to risk transfer and control of the project. Selecting the right project delivery method along with the right project delivery partner is key to the successful implementation of any project using these alternative delivery methods.

Given the potential cost savings associated with accelerating the BESP Phase 2 and 3 improvements, staff is recommending the Board consider using an alternative project delivery method for BESP Phases 2 and 3. Staff will continue to gather information on the various alternative project delivery methods and proposals from qualified firms and bring this issue back to the Board for further consideration in the future.

III. COMMENTS AND RECOMMENDATIONS

Regardless of which project delivery method and associated partner the District may elect to use in the future, the sooner we know more about the scope and costs of a combined BESP Phase 2 and 3 project, the better we will be in determining which alternative delivery method and partner is best suited for our needs.

The next step to deliver a combined BESP Phase 2 and 3 project is the completion of a preliminary engineering analysis to determine the estimated costs, scope of work and potential environmental impacts of the recommended Phase 2 and 3 improvements. Once this is complete, a preliminary financial plan and project delivery schedule can be prepared.

The total estimated cost for the combined BESP Phase 2 and 3 project is approximately $25M. Assuming the industry standard for design fee calculation at 10% of the project cost, the design of the project would be around $2.5M.

Given their prior work with the District in developing the BESP and extensive knowledge of the District's facilities capabilities and goals, Hazen was determined to be uniquely qualified to assist the District with the preliminary engineering designs services that are required. As such, staff requested that Hazen submit a proposal for this effort. After several discussions with the Hazen

team a final proposal (attached) was submitted for consideration. The District's Engineering Committee reviewed the proposal on Thursday February 3, 2022.

The proposal includes the following primary tasks:

1. Project Management
2. Review of existing information
3. Project Definition
4. Preliminary Regulatory and Permitting Assessment
5. Preliminary Design Report
6. Base Mapping and Site Investigations
7. 30% Engineering Design Plans and Specifications

Additional optional tasks included in the proposal:

8. Regional Dryer Facility Evaluation
9. Additional Permit Assistance

The total estimated cost for all primary tasks (1-7) is $475,202. In regard to the optional tasks, staff recommends including the regional dryer facility evaluation ($30,840) for a total cost of $506,042. The additional permit assistance can be performed a later date under a separate contract once the preliminary regulatory and permitting assessment is completed and the scope of environmental review and permit requirements are known.

The initiation of this project was not included in the approved FY 2021-22 budget. However, funding for this effort is available in the District's reserve accounts (Fund #650 and #655). For the reasons stated above, staff recommends the Board authorize the General Manager to execute an agreement with Hazen for the preliminary engineering design services as included in their proposal in an amount not to exceed $506,042 in the form of an addendum to proposal.

IV. REFERENCE MATERIAL

Excerpt from Final BESP Executive Summary

BESP Project Acceleration Cash Flow Comparison

Hazen Proposal for Preliminary Engineering Design of the BESP Phase 2 and 3 Improvements.

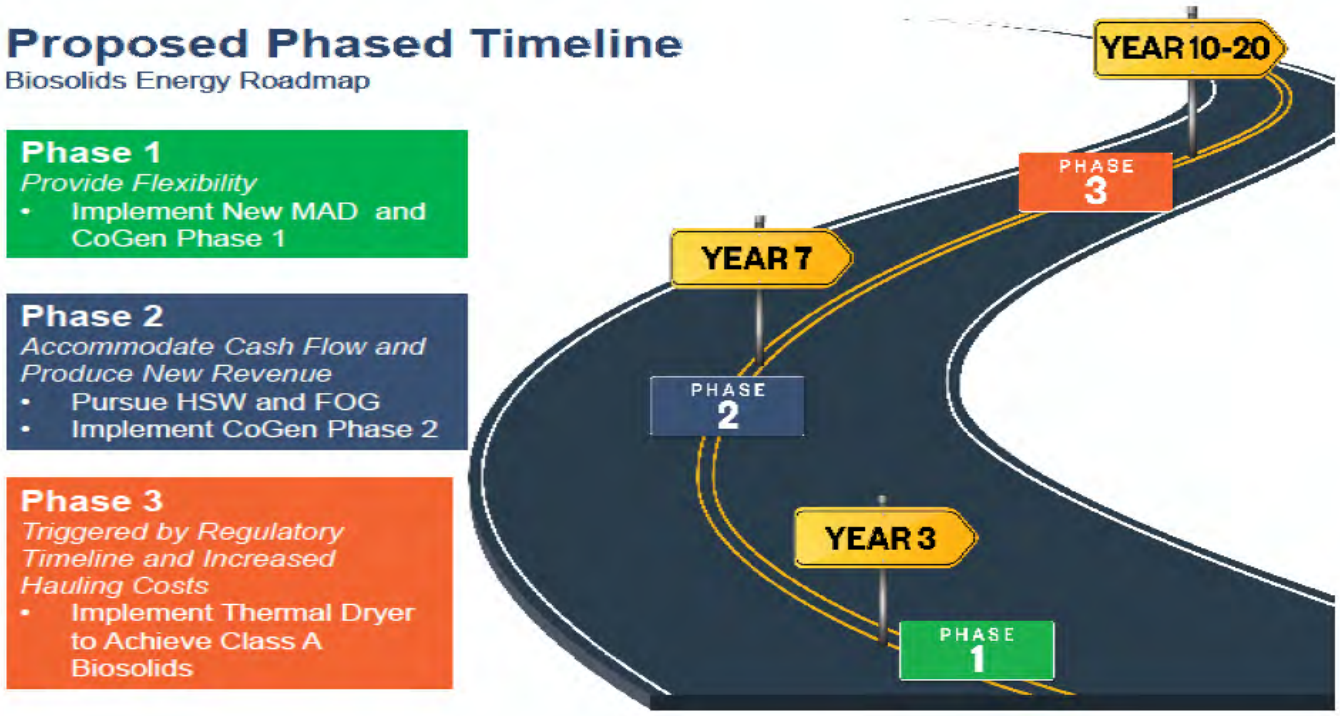


Figure 11. Proposed Phased Timeline Roadmap for Biosolids and Energy Strategic Planning

An interactive energy balance and economic model (EBAT) was developed as a part of this BESP (Figure 12). EBAT is calibrated to the specific energy balance and energy market/cost conditions for the GSD plant. EBAT has adjustable parameters for HSW receiving, capital costs, biogas production, energy consumption, solar PV, hauling costs, and energy market conditions. This model calculates the 20-year net present value for all biosolids process and biogas utilization alternatives included in this plan. It is the intent that GSD use this model to refine the economic and energy outcomes as capital costs are refined, funding/incentives are finalized, and market conditions evolve. This capability will enable GSD to make more informed decisions as future conditions change.

Capital Fund #4655 Cash Flow Analysis for UAL Payoff with & without BESP Financing

Interfund Loan Assumptions:		BESP Phase 2 &3 Loan Assumptions:		Operational Cost Assumptions:		BESP Cost Assumptions (Fund #4655)		Other Fund #4655 Revenue Assumptions:	
Beginning Balance Fund #4655:	$15,900,000	Loan Proceeds:	$18,000,000	Annual Electrical Costs:	$450,000	Phase 1 Construction Cost:	$11,000,000	Annual Sewer Service Charge Revenue	$1,000,000
Total UAL & OPEB to be paid off:	$3,800,000	Loan Cost:	1.0%	Electricity Inflation Index:	5%	Phase 2 & 3 Construction Cost:	$25,000,000	Annual Depreciation Revenue	$1,700,000
Intrafund Loan from Fund 4640:	$1,000,000	Interest Rate:	2.75%	Annual Hauling and Disposal Costs:	$500,000	Phase 2 &3 Design Cost:	$2,500,000	Annual Increase in Revenue	1%
Interfund Loan from Fund 4655	$2,800,000	Loan Term (yrs.):	20	Hauling and Disposal Inflation Index:	7%	Annual Construction Cost Index:	7%	Interest:	0.3%
Annual UAL Loan Payment:	-$401,212	Annual Payment:	-$1,193,912	Other Annual Capital Expenditures:	$2,500,000	Annual Electrical Cost Offset	25%	RFOGA on BESP Expenditures	47%
Interfund (UAL) Loan Rate:	1.00%	Total Interest Paid:	-$5,641,823	Annual Increase in Other Captial Expenditures:	1%	Annual Hauling Cost Offset	70%	RFOGA on Other Capital Fund Expenditures	25%
Interfund (UAL) Loan Term (yrs.)	10					Annual FOG Tipping Fee Revenue	$215,000		

Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Date	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	

BESP Phase 2 & 3 Acceleration - Project Cost Comparison

Annual Electricity Costs		$450,000	$472,500	$496,125	$520,931	$546,978	$574,327	$603,043	$633,195	$664,855	$698,098	$733,003	$769,653	$808,135	$848,542	$890,969	$935,518	$982,294	$1,031,408	$1,082,979	$1,137,128	
Annual Hauling and Disposal Costs		$500,000	$535,000	$572,450	$612,522	$655,398	$701,276	$750,365	$802,891	$859,093	$919,230	$983,576	$1,052,426	$1,126,096	$1,204,923	$1,289,267	$1,379,516	$1,476,082	$1,579,408	$1,689,966	$1,808,264	
Standard Project Delivery (1)																						
Electrical Cost Savings			$0	$124,031	$130,233	$136,744	$143,582	$150,761	$158,299	$166,214	$174,524	$183,251	$192,413	$202,034	$212,136	$222,742	$233,879	$245,573	$257,852	$270,745	$284,282	$3,489,295	
Hauling and Disposal Cost Savings			$0	$0	$0	$0	$0	$0	$562,024	$601,365	$643,461	$688,503	$736,698	$788,267	$843,446	$902,487	$965,661	$1,033,257	$1,105,585	$1,182,976	$1,265,785	$11,319,515	
FOG Tipping Fee Revenue			$0	$0	$0	$0	$0	$0	$215,000	$215,000	$215,000	$215,000	$215,000	$215,000	$215,000	$215,000	$215,000	$215,000	$215,000	$215,000	$215,000	$2,795,000	
Subtotal:			$0	$124,031	$130,233	$136,744	$143,582	$150,761	$935,322	$982,579	$1,032,985	$1,086,754	$1,144,111	$1,205,301	$1,270,581	$1,340,229	$1,414,540	$1,493,831	$1,578,437	$1,668,721	$1,765,067	$17,603,810	
Accelerated Project Delivery (2)																						
Electrical Cost Savings			$0	$124,031	$130,233	$136,744	$143,582	$150,761	$158,299	$166,214	$174,524	$183,251	$192,413	$202,034	$212,136	$222,742	$233,879	$245,573	$257,852	$270,745	$284,282	$3,489,295	
Hauling and Disposal Cost Savings			$0	$0	$428,765	$458,779	$490,893	$525,256	$562,024	$601,365	$643,461	$688,503	$736,698	$788,267	$843,446	$902,487	$965,661	$1,033,257	$1,105,585	$1,182,976	$1,265,785	$13,223,207	
FOG Tipping Fee Revenue			$0	$0	$215,000	$215,000	$215,000	$215,000	$215,000	$215,000	$215,000	$215,000	$215,000	$215,000	$215,000	$215,000	$215,000	$215,000	$215,000	$215,000	$215,000	$3,655,000	
Subtotal:			$0	$124,031	$773,998	$810,523	$849,475	$891,016	$935,322	$982,579	$1,032,985	$1,086,754	$1,144,111	$1,205,301	$1,270,581	$1,340,229	$1,414,540	$1,493,831	$1,578,437	$1,668,721	$1,765,067	$20,367,502	
Difference:					**$643,765**	**$673,779**	**$705,893**	**$740,256**														**Total Operational Cost Savings**	**$2,763,692**
Acce;erated Project Cost Savings:																						**Total Project Cost Savings:**	**$8,313,793**
																						Total Cost Savings Due tp Project Acceleration:	**$11,077,486**

Hazen

GOLETA SANITARY
Water Resource Recovery District

Proposal for

Biosolids & Energy Phases 2 and 3 - 30% Design

January 12, 2022

Hazen and Sawyer
90 New Montgomery Street, Suite 333
San Francisco, CA 94105 • 628.242.0042

January 12, 2022

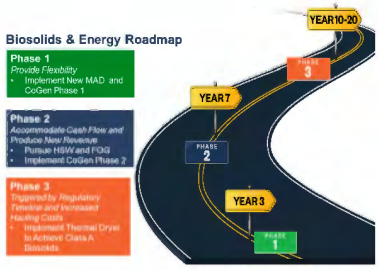
Mr. Steve Wagner, PE
General Manager
Goleta Sanitary District
One William Moffett Place
Goleta, CA 93117

Ref: Biosolids and Energy Strategic Plan Phase 2 & 3 - 30% Design

Dear Steve,

In early 2018 Hazen and Goleta Sanitary District (GSD) began working in partnership to set a dynamic vision of biosolids beneficial reuse and energy self-sufficiency consistent with GSD's vision of a ***Utility of the Future***. The *Biosolids and Energy Strategic Plan*, completed in late 2019, injected fresh thinking, solidly based in business reality to develop a roadmap for GSD to build on its efforts to be good stewards of precious resources.

The Biosolids and Energy Strategic Plan (BESP) recommended a phased approach for implementation. Hazen and GSD are currently working collaboratively on the design of Phase 1, which is comprised of a new digester and combined heat and power (CHP) system. The Phase 1 design will be completed in early 2022, so GSD has now requested a proposal from Hazen to initiate the 30% design of Phases 2 and 3, which is comprised of a fats, oil and grease (FOG) receiving station and thermal dryer.



The Hazen team embraces the opportunity to continue collaborating with GSD to bring the BESP to reality. Selecting Hazen for the design of Phases 2 and 3 will build on the institutional knowledge gained from development of the BESP that set the foundation for design of Phase 1 of GSD's BESP. To initiate design of Phases 2 and 3, we propose a team that combines team members that worked on the BESP and BESP Phase 1 Design boosted with new team members with expertise in the design of FOG receiving stations and thermal dryers.

Hazen is committed to technical excellence, attention to detail, and superior client service and we will continue to bring this same level of service to GSD's BESP Phases 2 and 3 Design project.

Hazen views this project as another opportunity to continue to build our successful partnership with Goleta Sanitary District.

Throughout this project, Hazen and our team partners will work collaboratively with GSD to truly ***realize more*** from the BESP vision. Hazen is committed to providing the leadership and resources necessary to ensure a successful outcome for your project. Should you have any questions about this proposal, please do not hesitate to contact Rion Merlo at 510-499-7466 or rmerlo@hazenandsawyer.com.

Sincerely,

Marc Solomon, PE, BCEE, D.WRE
Project Director

Rion Merlo, PhD, PE, PMP
Project Manager

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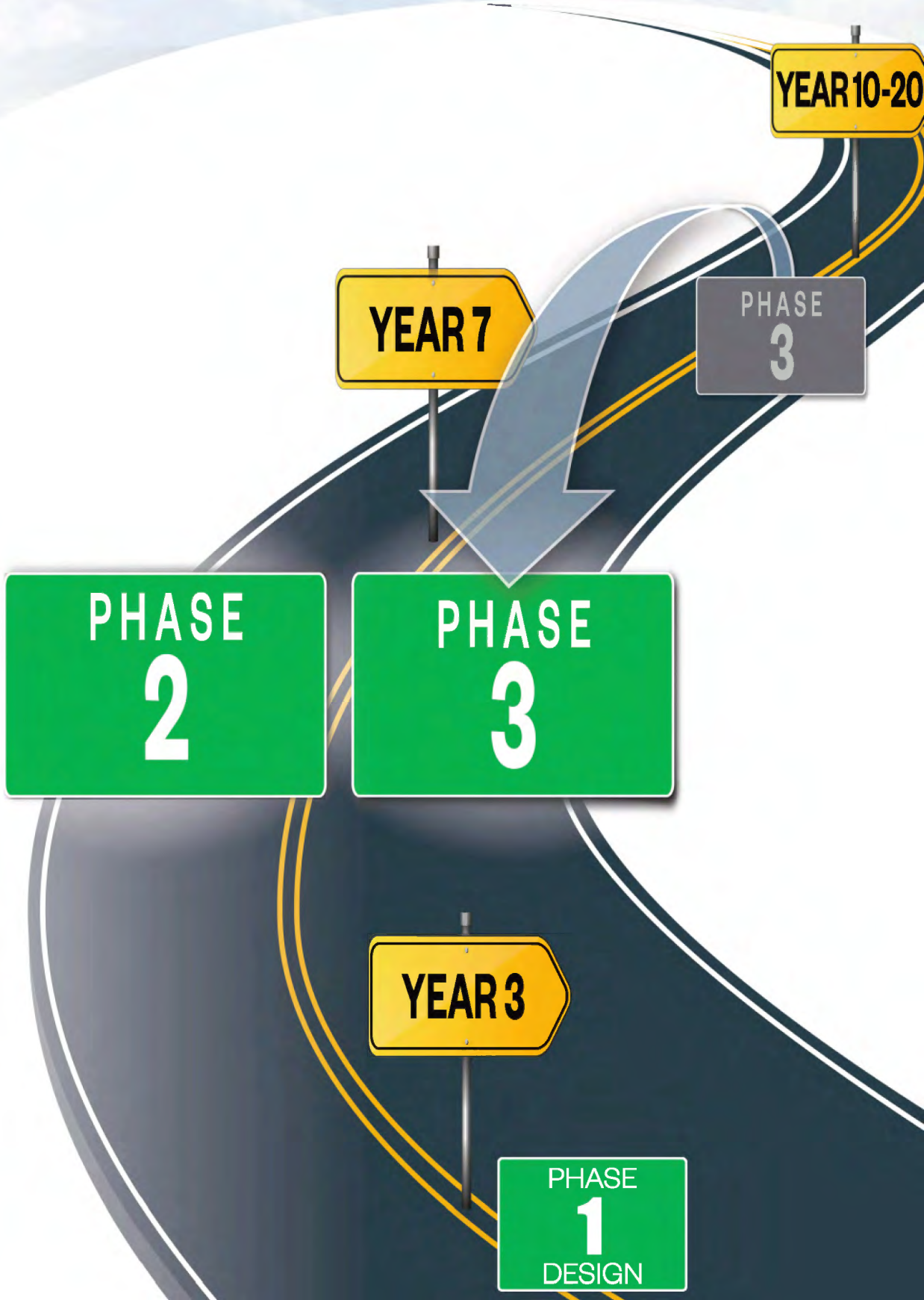
Section 1

Project Understanding and Scope of Services



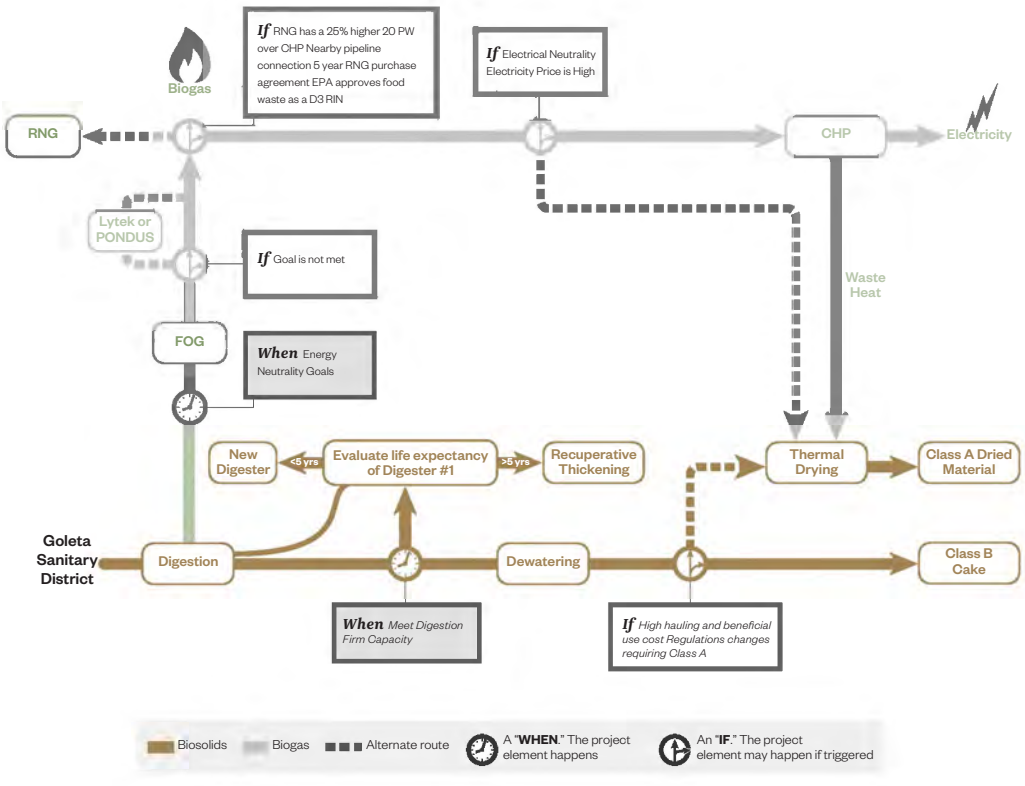
Section No. 1

Project Understanding and Scope of Services

The drivers for owners of water resource recovery facilities (WRRF) to re-evaluate their practices of managing biosolids and energy continue to evolve in response to changing regulations, including land application restrictions, diversion of organic waste to WRRFs due to landfill bans, air pollutant mitigation rules, and greenhouse gas emission requirements as well as other externalities. These issues can be particularly challenging for smaller utilities with limited resources and economies of scale, such as Goleta Sanitary District (GSD).

One advantage of being a small utility that solely treats wastewater and recovers the resources is the ability to be nimble and progressive in pursuing innovative solutions to evolving challenges. The Biosolids and Energy Strategic Plan (BESP) that was completed in 2019 established a 10-year phased for roadmap for implementation of the BESP, along with a trigger map (shown below) should events change over time.

Changing market conditions for hauling biosolids to landfills is causing GSD to consider accelerating the schedule for phases 2 and 3 of the BESP which includes a fats, oil and grease (FOG) receiving station and thermal dryer.



The following provides GSD with a scope of services for the 30% design of adding a FOG receiving station and thermal dryer facility at GSD's WRRF.

Scope of Services

Task 1 – Project Management

Upon award of contract, Hazen will submit an updated Project schedule to the GSD for review. Hazen will develop a Project Plan to define Hazen, GSD, and subconsultant staff roles and responsibilities, project objectives, schedule, and deliverables. Hazen will develop and execute the subcontracts, manage the subconsultants, update scheduling, conduct internal design progress meetings, and associated communications. A Kick-off Meeting will be held to introduce key team members and review Project objectives, deliverables, schedule, and QA/QC plan.

Hazen will submit Monthly Progress Reports and Invoices. The Progress Reports include information related to work completed that month, work expected for the next month, important upcoming milestones, and updates on schedule and budget. The actual percent complete, budget expended and any scope, budget, or schedule issues for each task would be included. Invoices will include billing for work completed in the prior month. At the time of preparing this proposal, it is assumed most, if not all, workshops and meetings will be conducted virtually.

Deliverables:

- Kick-off Meeting Agenda and Summary
- Meeting Agendas and Summaries
- Monthly Progress Reports and Invoices

Task 2 – Document Review

Most of the existing information that will be required for design has been provided to Hazen from previous project phases and therefore additional data requests will be limited to design background files.

Task 3 – Project Definition

Key assumptions from the Biosolids and Energy Strategic Plan will be carried forward in further defining the project. The project consists of two key elements.

FOG Receiving Station – The basis of FOG deliveries and process flow diagram established in the Biosolids and Energy Strategic Plan will be assumed to develop a preliminary layout and identification and sizing of major equipment for the FOG receiving station.

Thermal Dryer Facility – The basis of the thermal dryer facility established in the Biosolids and Energy Strategic Plan will serve as a starting point for the Thermal Dryer Facility. As part of this task, the approach to dewatering will be new centrifuges and retaining the existing screw presses for redundancy. The type of thermal dryer equipment assumed to produce pellets will be determined. The sizing of the thermal drying facility and auxiliary processes will be developed. It is assumed that the thermal dryer facility will be enclosed in a new building at the location identified in the Biosolids and Energy Strategic Plan. Conceptual layouts and cost estimates will be developed to be included in the Preliminary Design Report (Task 5).

Task 4 – Regulatory and Permitting

Task 4.1 – Emission Calculation and Regulatory Support

Yorke Engineering (Yorke) will collect and review data on the proposed project equipment and locations. This information will include the proposed equipment lists with information on sizes and expected operations. Using the data collected, Yorke will quantify the emissions on an hourly, daily, and annual basis for regulatory analysis purposes. Emission calculations will include criteria pollutants, toxic air contaminants (TACs), and greenhouse gases (GHGs). We will account for any control systems planned or likely to be required. Yorke will estimate emissions for the Phase 2 and 3 equipment and will summarize total project emissions as needed.

Yorke will review the processes, equipment, and chemicals to determine the likely air permitting and CEQA requirements related to the Phases 2/3 for BESP. Air quality analysis will include a rule review to determine what rule compliance requirements may impact the project (controls, work practice standards, monitoring requirements, etc.). A preliminary New Source Review (NSR) evaluation will be conducted to determine the Best Available Control Technology (BACT) requirements for the new and modified equipment proposed for these phases of the project and to determine if emission offsets would be required for the project. If offsets are required, Yorke will provide input on the availability of emission reduction credits (ERCs) and a range of potential costs. Yorke will compare the estimated emissions to applicable rule thresholds to demonstrate compliance with SBCAPCD rules. Yorke will also compare operational emissions to applicable CEQA air quality thresholds for a preliminary determination.

No modeling or health risk assessment (HRA) are proposed at this stage. Yorke will provide guidance on the design, such as potentially applicable BACT requirements, stack design considerations, more favorable equipment/designs, etc. Preliminary feedback may change during the permitting process as the SBCAPCD does their engineering evaluation. We have assumed up to four conference calls may be requested to discuss the proposed project phases and permitting considerations.

Yorke will provide a letter report summarizing the results of the investigation, including the required BACT for emissions control, air permitting timeframe and permitting costs, and other regulatory requirements. Yorke will also provide input on potential CEQA requirements.

Deliverables:

- Preliminary Emissions Inventory
- Draft Summary Letter Report
- Final Summary Letter Report

Task 4.2 – Biological Resources

Dudek will prepare the biological resources section of the IS/MND. The project site is located immediately adjacent to the Phase I project site; therefore, the biological resources section for the MND would be very similar to that completed for the Phase I MND. Information from that report would be incorporated into the biological resources section of the MND, which will describe the literature review, survey methods, survey results, and the potential for impacts to biological resources. Results will include descriptions of any vegetation communities and land covers in the survey area, and a brief discussion of the potential for special-status plant and wildlife species to occur in the survey area. The discussion of potential impacts will include recommendations of avoidance, minimization, and mitigation measures, if necessary, based on the impact analysis.

Deliverables:

- Draft Section of Biological Resources Section of IS/MND
- Final Section of Biological Resources Section of IS/MND

Task 4.3 – Cultural Resources

Fieldwork. Since the proposed Project location is outside the area originally surveyed in 2020 an intensive pedestrian survey will be conducted using no greater than 10-meter (30-foot) parallel transects. We anticipate vegetation and hardscape to obscure a majority of the ground surface throughout the proposed project area. All barren ground and exposed subsoils exposed as a result of burrowing animals will be examined carefully. To overcome visibility issues, a shovel will be used to scrape away vegetation to reveal the ground surface. If necessary, shovel scrapes will occur in 10-meter intervals, or subjectively as appropriate.

Tribal Consultation Support. Since this proposed Project is outside the Biosolids and Energy Phase I project, a separate tribal consultation will be required. Additionally, since the tribes have already been involved in tribal consultation for the previous project early outreach and consultation is highly recommended. Dudek will, upon the client's authorization, initiate project coordination with local tribal representatives pursuant to AB-52 Tribal Consultation requirements. This coordination shall be conducted in support of GSD but will be limited to those task that will not jeopardize the formal government-to-government consultation process as specified by AB 52. These efforts will be accomplished by the following:

- Contact the California State Native American Heritage Commission (NAHC) to request a review of their Sacred Lands and obtain a list of tribal representatives with potential knowledge of cultural resources within the project area.
- Compose notification letters subject to GSD's approval and placement on District letterhead for dissemination to each of the tribal entities that have requested formal notification of projects under GSD's jurisdiction. The letter will include but may not be limited to the following: location of proposed Project site and associated figure, a summary of the proposed Project and objectives including extent of ground disturbing activities (if known), results of background research including the CHRIS and NAHC SLF records search results, agency contact information, and a clear statement requesting all communication within 30 days of receipt of notification.
- If GSD desires, Dudek will compile print and mail (USPS certified mail) all notification letter packets to the eligible tribal representatives upon the City's request and authorization. Notification should also include email communication; however, in order to retain the government-to-government consultation process, the City will need to send the notification emails from a City email server. As such, tribal notification emails are not included in this scope and cost.
- Attend tribal consultation meetings to provide support and information regarding the cultural resource investigation conducted for the proposed Project. This scope assumes no more than a total of 3 hours will be required to attend meetings.

Native American consultation is the responsibility of CEQA lead agency, in this case GSD. Dudek's Native American coordination efforts will be completed in support of GSD. Dudek will provide all information on coordination efforts at the time of request by the lead agency, and with appropriate permission, will coordinate with GSD to ensure their Native American consultation obligations are fulfilled.

Preliminary Cultural Assessment Report Memo Preparation. The results of the background research, archaeological survey, and if desired tribal consultation efforts will be presented in the preliminary cultural assessment report memo to inform GSD regarding next steps. Additionally, this research, survey and analysis will be used to compose the IS/MND cultural resource and tribal cultural resource sections. We assume no new resources will be identified that require additional evaluation. Should resources be identified that require more intensive field and documentation efforts, we will work with you to augment this scope and cost as appropriate. Dudek assumes that the proposed Project site will be delineated by the client on the ground with stakes or that a GIS shape file will be provided to assist with locating the project boundaries for purposes of the intensive ground survey. The preliminary cultural assessment report memo will be presented electronically, in pdf format, within no more than 21 working days of field survey completion. We will be pleased to work with you to expedite this report, if desired. We assume no more than one round of comments will require response on the Phase 1 Report.

Cultural and Tribal Cultural Resources MND Sections. Dudek will prepare the cultural resources and Tribal cultural resources sections of the IS/MND, describing the records search results, literature review, survey methods and results, all Tribal consultation efforts and communication and the potential for impacts to cultural and Tribal cultural resources. The discussion of potential impacts will include recommendations of avoidance, minimization, and mitigation measures based on the impact analysis.

Archaeological Monitoring. Dudek will provide archaeological monitoring for all initial ground disturbance activities throughout the duration of the Project. The costs associated with this task assume three days of monitoring.

Assumptions:

- Dudek assumes Native American monitoring will be contracted directly between GSD and Tribal entities and that Dudek is not responsible for procuring, arranging and contracting of Native American monitoring for any ground disturbing activities associated with this Project.
- Dudek assumes that monitoring staff will be informed at least 48 hours before the start of each week (Monday) and at the end of each workday whether ground disturbing activities requiring archaeological monitoring, pursuant to the Conditions of Approval, will be occurring the next business day.
- Dudek assumes that a workday consists of 8 hours. However, we will be pleased to provide monitoring for half days. The archaeological monitor will not bill less than 4 hours. For instance, if Dudek has been informed that monitoring is necessary for the next day and arrives at the Project site prepared to monitor, but ground disturbing activities are not occurring and monitoring is not necessary, Dudek will bill a half day (4 hours) regardless of the amount of time up to 4 hours the monitor/s has spent at the Project site.
- Dudek assumes all ground disturbing activities requiring archaeological pursuant to the Conditions of Approval, will occur no more than 8 hours in any given day. However, we will be pleased to provide monitoring greater than 8 hours per day, if desired, for an augmented rate of those rates provided in this proposal.
- Dudek assumes all ground disturbing activities requiring archaeological pursuant to the Conditions of Approval, will occur during the day (anytime between 6:00 am and 6:00 pm) However, we will be pleased to provide evening monitoring, if desired, for an augmented rate of those rates provided in this proposal.
- Dudek assumes all ground disturbing activities requiring archaeological pursuant to the Conditions of Approval, will occur during regular business days (Monday-Friday). However, we will be pleased to provide weekend monitoring, if desired, for an augmented rate of those rates provided in this proposal.

Deliverables:

- Preparation of notification letters for dissemination to tribal entities
- Preliminary cultural assessment memo
- Cultural resources and tribal cultural resources sections of IS/MND
- Archaelogical monitoring memo

Task 4.4 – Geology, Hydrology, Mineral and Paleontology for MND

Geology/Soils. The project site is located immediately adjacent to the Phase I project site; therefore, the geology and soils section for the MND would be very similar to that completed for the Phase I MND. It is anticipated that a project specific geotechnical investigation, including soil borings, would be completed as part of the proposed project. Information from that report would be incorporated into the geology and soils section of the MND. It is anticipated the remainder of the section would be very similar to the Phase I MND section.

Hydrology/Water Quality MND Sections. The project site is located immediately adjacent to the Phase I project site; therefore, the hydrology and water quality section for the MND would be very similar to that completed for the Phase I MND. Similar to Phase I, the proposed project would be outside the 100-year flood zone of San Pedro Creek. It is anticipated that a project specific geotechnical investigation, including soil borings, would be completed as part of the proposed project. Depth to groundwater information (if any) would be incorporated into the hydrology and water quality section of the MND. It is anticipated the remainder of the section would be similar to the Phase I MND section.

Mineral Resource MND Section. The project site is located immediately adjacent to the Phase I project site; therefore, the mineral resources section for the MND would be identical to that completed for the Phase I MND.

Paleontology. As per CEQA, Dudek's qualified paleontologists will complete a paleontological resources inventory and assessment, which will include a paleontological records search through the Natural History Museum of Los Angeles County (LACM), geological and paleontological literature and map review and documentation of results in the geology and soils chapter of the Initial Study/Mitigated Negative Declaration. Dudek's qualified paleontologists will begin with a paleontological records search through the LACM. The purpose of the records search is to determine the location of any previously recorded fossil discoveries within and nearby the project site. We assume direct fees for the LACM records search will not be more than $600. Dudek will prepare a Paleontological resources write-up within the geology and soils chapter of the IS/MND that will satisfy CEQA and Society of Vertebrate Paleontology requirements. The paleontological portion of the CEQA document will summarize the results of the paleontological resources records search and geological map and paleontological literature review, regulatory framework, and recommendations for appropriate management.

Assumptions:

Dudek assumes that the write-up for the CEQA document will be sufficient to document the negative results. Should resources be encountered requiring recordation and a stand-alone technical report be necessary, Dudek will augment this scope and cost as appropriate in order to prepare a full paleontological survey report.

Deliverables:

- Geology and solids section of MND which includes paleontological resources
- Hydrology and Water Quality Section of MND
- Mineral Resources Section of MND

Task 5 – Preliminary Design Report

Hazen will provide a Draft and Final Preliminary Design Report (PDR). The report will include a summary of the investigative work and analysis above including a recommended project with phasing. The PDR submittal will include the 30% drawings and cost estimate (Task 7). GSD will review and provide comments to Hazen. Hazen will address all comments and finalize the PDR.

Deliverables:

- Draft Preliminary Design Report
- Final Preliminary Design Report

Task 6 – Basemapping and Site Investigations

A site survey and base mapping, along with a geotechnical investigation, including soil corrosivity analysis will be conducted. Hazen will review any previous geological studies and identify locations for potholing of existing utilities based on PDR layouts. Underground utility investigations, if needed, will be provided by GSD.

Task 7 – 30% Design Preparation

The 30% design will advance the preliminary design to include additional detail items such as:

- Process and instrumentation diagrams (P&ID)
- Civil grading, paving, piping, demolition
- Structural plans and sections
- Mechanical plans sections
- Architectural notes as required
- Electrical plans and one-lines
- A list of technical specifications
- Updated construction schedule and cost estimates

The 30% design drawings and specifications will follow Hazen's design standards. A 30% workshop will be conducted to gather GSD's input and gain consensus on the design. A Class III Cost Estimate will be prepared as part of the 30% Design Submittal. An interim cost estimate will be provided as shown in the project schedule to provide information to the GSD to explore financing.

Deliverables:

- Interim Cost Estimate
- Final Cost Estimate
- 30% Design Submittal

Optional Services

We have included two tasks for GSD's consideration. Task 8 is a Regional Dryer Evaluation that is intended to determine the viability of partnering with other agencies. Task 9 includes additional permit assistance that includes the development of the Coast Development Permit and Data Recovery (Phase III) Excavations. The Coast

Development Permit task would be performed concurrent with MND preparation; Data Recovery (Phase III) Excavations would be performed following MND approval. We have included this task in the event GSD would like to contract these tasks as part of this project.

Task 8 – Regional Dryer Facility Evaluation

Hazen will determine the feasibility of a regional dryer facility with one or more partners. In partnership with GSD, this will involve identification of up to five potential partner agencies, outreach to determine interest and subsequent economic evaluation. One alternative will be considered and conceptual cost layouts will be developed and Class V capital cost estimates and select operating costs. Results from the analysis will be summarized in a technical memorandum and presented in a workshop.

- Draft Technical Memorandum
- Final Technical Memorandum
- Class V Cost Estimate

Task 9 – Additional Permit Assistance

Task 9.1 – Coastal Development Permit

This scope is conditional on whether GSD decides to submit the Biosolids and Energy Phase I project with this Phase 2 and 3 project. If GSD decided to submit the project phases under two separate permits, the following scope and cost would be required. However, if GSD submits both projects under the same permit, the scope and cost already under contract would cover both projects and no additional costs would be incurred.

Dudek will coordinate with GSD and County staff throughout the CDP application process. Dudek will assemble the CDP application package, including completing the CDP application form, compiling all required attachments and public noticing materials, and preparing a submittal letter that summarizes environmental information and technical studies to demonstrate compliance with applicable LCP policies.

CDP support services include the following:

- Preparation of a CDP application package (hard copy and electronic);
- Preparation of one response to County incomplete letter (electronic);
- Review of County staff report, including conditions of approval and findings;
- Preparation for and attendance of PC hearing to support GSD's presentation, if necessary; and
- Compilation of condition compliance materials.

Given the level of uncertainty that exists in obtaining a CDP, including unanticipated data needs and technical study following review of application materials and the level of support required at the public hearing, additional work authorization may be required and would be subject to separate scope and fees.

Task 9.2 Data Recovery (Phase III) Excavations

Dudek will conduct a Phase III data recovery study pursuant to CEQA requirements and regulations. The general tasks required to conduct and prepare a Phase III Archaeological Data Recovery Investigation include:

- Research design, literature review and background research
  - A research design will be developed and include a series of research questions to ensure that the appropriate amount and nature of data will be collected and analyzed in order to "yield information important in prehistory," pursuant to CEQA Guidelines Section 15064.5(a)(3)(d) For each research question (expressed as a hypothesis), test implications will be identified that suggest the types of information to expect if the hypothesis is true. Data requirements will then be identified, referring to the types of archaeological artifacts and materials that would need to be collected in order to address the research questions.
  - All relevant literature and historical data will be examined and incorporated into both the research design and ultimately into the Phase III Data Recovery Report.
- Excavation field work
  - No more than six (6) hand-excavated 1 by 1 meter units associated with the proposed ground disturbances will occur within intact midden identified as a result of the impact analysis and in consideration of previous excavations.
  - A column sample 0.20 meters square shall be excavated within each 1 by 1 meter unit to recover detailed subsistence data. All soils recovered will be collected, screened and labeled separately from other excavated soils.
  - If any unexpected features or other significant sources of data are encountered during the course of this Phase 3 Data Recovery, excavation units will be extended to recover the potential data within these deposits.
  - Excavation units within the intact midden will be excavated by hand, in 4-inch (10-centimeter) levels.
  - Excavated soil (with the exception of column soils) will be screened in the field through 1/8-inch wire mesh. If needed, an onsite temporary water screening area prearranged with the client or off-site at Dudek's laboratory, will be conducted. All excavated soil recovered from the column samples will be screened through 1/16-inch mesh to allow for more specific analyses of food remains and to recover very small artifacts.
- Artifact analysis
  - Screened cultural material sorting. Archaeologists will sort the screened material to isolate all cultural materials including: shellfish; animal bone; stone tool making flakes; stone tools; ground stone tools used for food processing; beads used as currency; and other materials such as asphaltum used for waterproofing baskets and canoes.
  - Food Remains (Fauna). Dudek Bioarchaeologist will undertake analyses of shellfish, animal bone, and fish bone to determine what habitats theCA-SBA-58 occupants were exploiting, and if this changed over time.
  - Stone Tool Analyses. Dudek Lithic Analysis Expert will analyze the chipped stone tools and manufacturing flakes to determine dating of the site and trade activity.
  - Beads. Dr. John Johnson, Santa Barbara Museum of Natural History, or his designee will analyze the beads that are recovered from the 1/8-inch and 1/16-inch screen residue. The beads are excellent indicators of when CA-SBA-46 was occupied, and if beads were being manufactured at this site
  - Seeds and Plant (Macrobotanical or Floral) Remains. Dudek Botanical Analysis Expert will undertake the analysis of seeds and plant remains that are recovered in the soils samples to be collected.
  - Radiocarbon Dating. Up to ten radiocarbon dates will be analyzed by DirectAMS.
  - Obsidian Sourcing. If obsidian tools or flakes are recovered, up to four specimens will be analyzed by Northwest Obsidian Research to determine the source of the material that was traded to Santa Barbara.

- Report preparation
  - The Draft Phase III Data Recovery Report will assemble and synthesize the results of all background research, literature review, impact analysis, fieldwork and laboratory analyses, addressing the research questions presented in the Research Design.
  - The Draft Phase 3 Data Recovery Report will be presented electronically, in pdf format, within no more than 65 working days after completion of total excavation efforts.
  - Dudek will respond to one round of comments from GSD on the Draft Report. The Final Phase 3 Data Recovery Report will be presented electronically, in pdf format, within no more than 15 working days after the final delivery of requested revisions by GSD.
- Curation of cultural resources
  - Pending the results of AB-52 Tribal consultation, the final Phase III data recovery report, archaeological artifact collection/assemblage, field notes, and other standard documentation will be perpetually curated at the UCSB Repository for Archaeological Collections." We assume this will NOT include shellfish materials that were collected outside of the column samples used for faunal analysis. The costs of curation are dependent on the volumes of cultural materials and are estimated at $5,000.

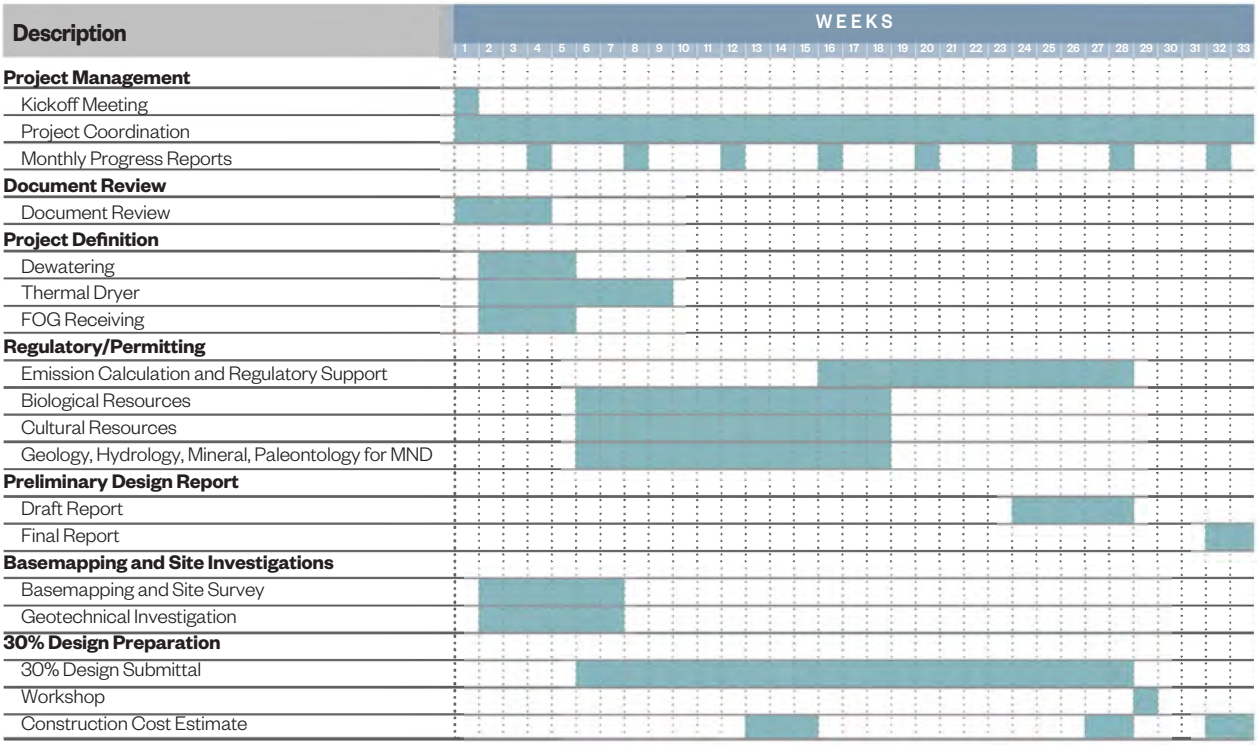
Assumptions:

- Dudek assumes Native American monitoring will be contracted directly between GSD and Tribal entities and that Dudek is not responsible for procuring, arranging and contracting of Native American monitoring for any archaeological excavation activities associated with this Project.
- Dudek assumes no more six 1x1-meter excavation units are necessary to accomplish an appropriate level of data from the archaeological site CA-SBA-46.
- Dudek assumes curation fees included in the scope/cost and charged by the local federally recognized facility (UCSB) for perpetual storage of recovered artifacts will not exceed $5,000.

Deliverables:

- Draft Phase III Data Recovery Report
- Final Phase III Data Recovery Report

Project Schedule



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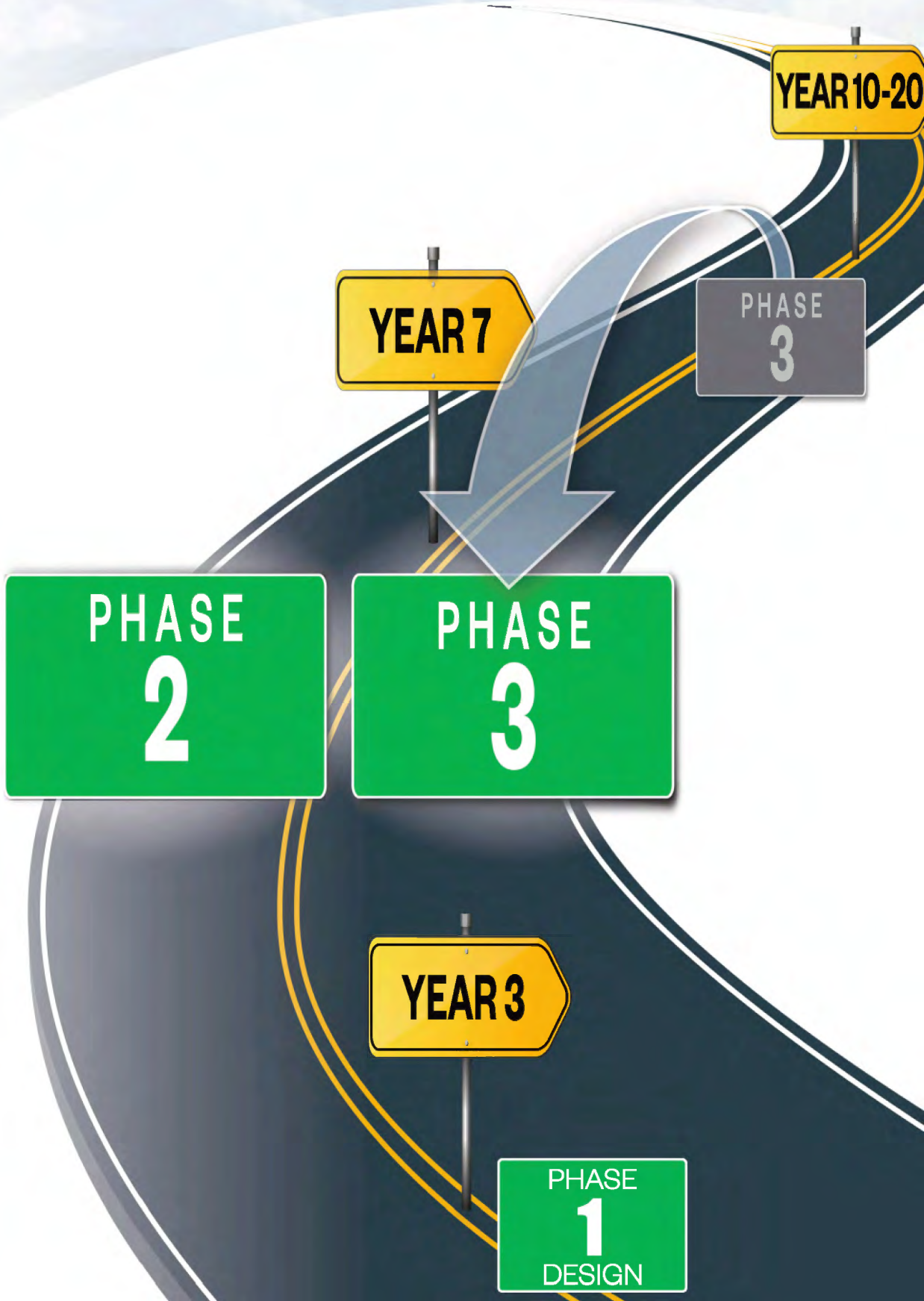
Section 2

Firm and Project Team Qualifications



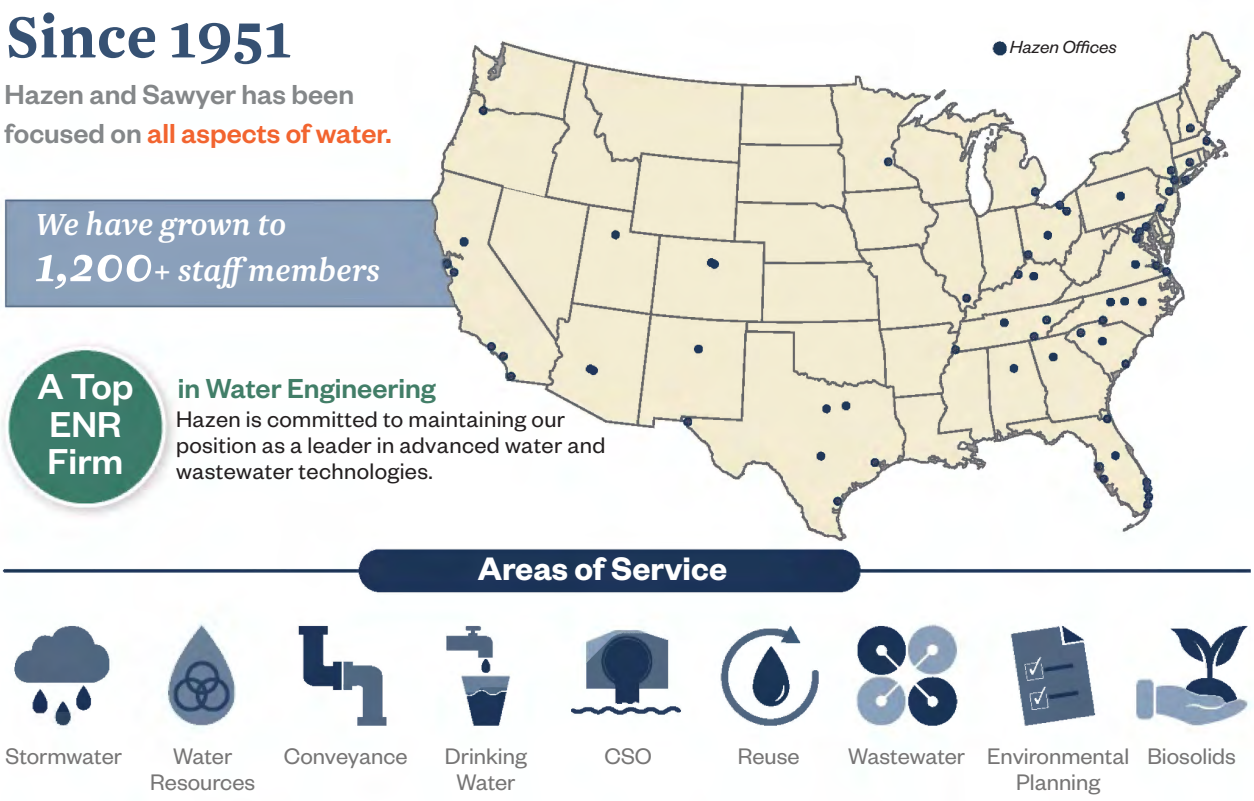
Section No. 2

Firm and Project Team Qualifications

Hazen's collaborative approach with a focus on the business/financial implications and delivery of technical expertise will continue to identify the best solutions for implementation of Phases 2 and 3 of Goleta Sanitary District's Biosolids and Energy Management Strategic Plan.

Hazen will be the lead firm for the 30% Design for BESP Phase 2 and 3 project. We will supply all management and technical leadership, leveraging our industry-leading expertise for GSD's benefit. Our project partners have been selected to embody a focus on collaboration and leveraging of technical excellence.

The Hazen Team, including our Subconsultants, Yorke Engineering, Dudek, Ninyo & Moore and Tartaglia, has the capabilities and capacity to meet the design requirements, regulatory requirements, cost control, schedule milestones and quality parameters necessary to realize your vision for a sustainable future.



1014-200

Subconsultants

Yorke Engineering, LLC (Yorke) was founded in 1996 to provide professional air quality and environmental services to clients in government and industry. With offices in Los Angeles, Alameda, Kern, Fresno, Orange, Ventura, San Diego, and Riverside Counties. Yorke specializes in air quality and environmental permitting and compliance under the Santa Barbara County Air Pollution Control jurisdiction and other California air districts. Since Yorke's founding, they have served over 550 client organizations, including water and sanitation districts, waste-to-energy plants, biogas facilities, regional and municipal power plants, numerous cogeneration facilities, cities, counties and special districts.

Founded in 1980, Dudek is a California based firm that has grown to 600+ environmental planners, scientists and engineers who help clients plan, design and build projects that improve communities' built and natural infrastructure. Dudek's registered professional archaeologists (RPAs) specialize in identifying resources that may cause project constraints and understanding their historical significance. Their RPAs have decades of experience and are qualified consultants on many local agency lists.

Ninyo & Moore is a professional geotechnical and environmental sciences consulting firm providing services in geotechnical engineering, engineering geology, geophysics, hydrogeology, soil and materials testing, special inspection, soil and groundwater contamination assessment, site remediation, hazardous building materials, industrial hygiene, and occupational safety.

Tartaglia Engineering is a multi-disciplinary civil engineering firm founded in 1982 that provides a range of land surveying services as well as permitting and planning, construction management and construction inspection.

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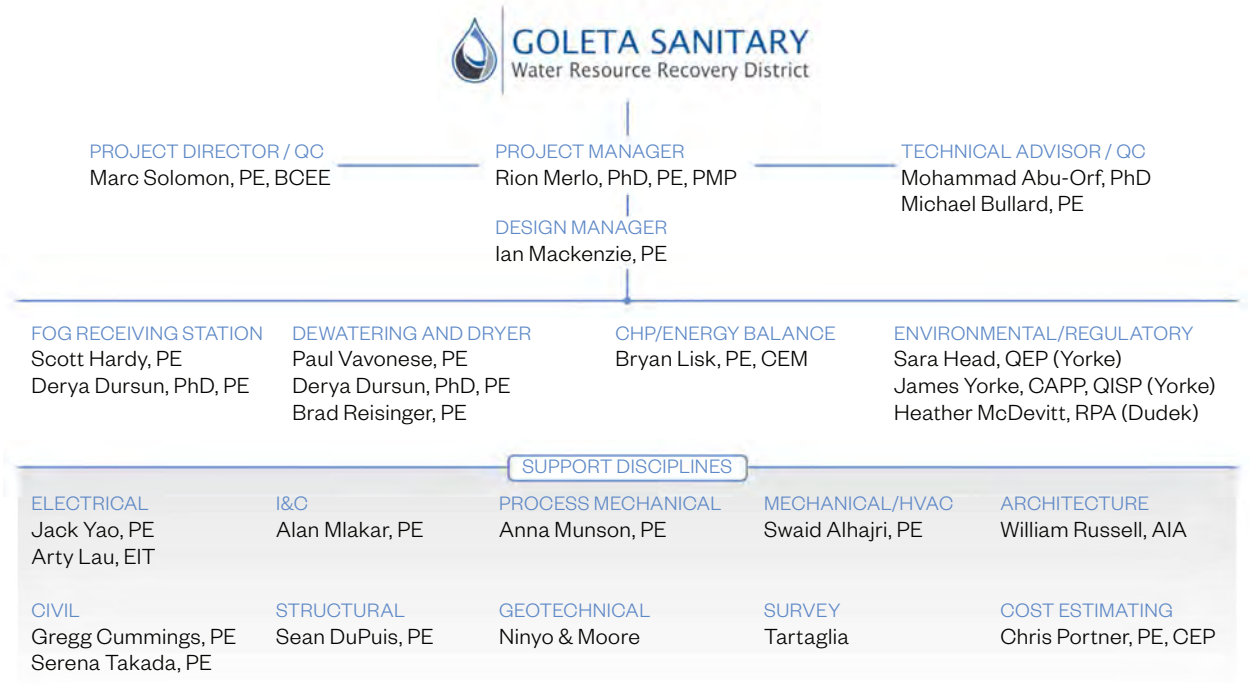
Organizational Chart

The Hazen team is comprised of both local and national experts who welcome the opportunity to work on this project and further apply the knowledge gained of GSD's treatment facility. Our project team's key personnel, led by Rion Merlo, Ian Mackenzie, Scott Hardy, Paul Vavonese, Derya Dursun and our Technical Advisers Michael Bullard and Mohammad Abu-Orf, all have extensive experience in the evaluation and design of FOG receiving stations and thermal dryers for wastewater utilities. Our proposed organizational structure and staffing plan is shown below followed by capsule resumes of key project leaders. Detailed resumes can be found in the Appendix A.



Management Team

To ensure this project has the leadership needed to meet the project objectives on schedule and within budget, we are proposing a strong and experienced management team.

Rion Merlo, PhD, PE, PMP

Project Manager

Dr. Merlo has over 25 years of experience as a water and wastewater process engineer. He has served as project manager for numerous major wastewater treatment projects. His experience ranges from planning, pre-design and design services. A number of projects have included the coordination of multi-discipline, multi-location and multi-firm teams delivering complex projects on time and within budget.

Marc Solomon, PE, BCEE

Project Director

Mr. Solomon has successfully managed large wastewater projects for 35 years. His background managing diverse, complex, multi-discipline projects enables him to provide guidance and anticipate the needs of the team to successfully deliver this project for GSD. His experience and unique ability to engage technical and operational staff in the use of triple bottom line plus analysis for alternative evaluation and decision-making will help will help guide the both the Hazen team and GSD staff to finding the most viable solutions.

Technical Advisors

A Quality Culture is an attitude that touches the entire project team, establishes the technical and quality standards the team works to and builds on the technical experience and quality processes that guides the day-to-day work.

Mohammad Abu-Orf PhD

Technical Advisor

Dr. Abu-Orf is Hazen's National Residuals and Biosolids Practice Leader. His diverse experience ranges from research and development, project planning, preliminary design, operations and technical services. He applies his expertise to find opportunities for process optimization, evaluation of innovative technologies and conceptual design in the areas of sludge dewatering, stabilization, and energy recovery.

Michael Bullard, PE

Technical Advisor/QA-QC

Mr. Bullard is Hazen's National Residuals and Biosolids Practice Leader and has extensive experience in the full range of residuals and biosolids thickening, stabilization, dewatering, biogas utilization and treatment systems and ultimate residuals management processes from a planning, design and operational perspective.

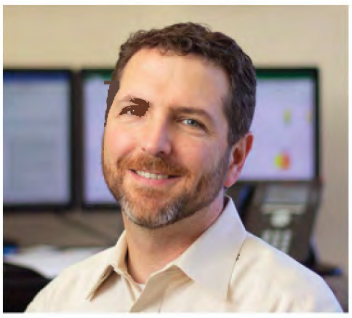
Process and Design Leads

Our Process and Design Leads have all successfully collaborated together on projects for Goleta Sanitary District and similar wastewater treatment improvement projects.

Ian Mackenzie, PE

Design Lead

Mr. Mackenzie has extensive experience in the design and construction of wastewater treatment facilities. Ian is currently the lead design engineer for the BESP Phase 1 Design and the Plant 3A Biosolids Handling Improvements project for Moulton Niguel Water District. He recently led to completion the design for SOCWA's J.B. Latham and Coastal Treatment Plant Facilities Improvement project.



Scott Hardy, PE

FOG Receiving Station Design

Mr. Hardy is a well-respected and published solids and residual processing expert, specifically in the areas of anaerobic digestion, co-digestion (supplementing with FOG and other high strength wastes), combined heat and power generation, thickening, dewatering, and thermal drying.

Paul Vavonese, PE

Dryer Design

Mr. Vavonese specializes in wastewater treatment plant upgrades, biogas beneficial use and energy saving projects. Paul has experience with biosolids thickening and drying, pump evaluation, selection and system design, large-scale Design/Build projects, managing complex projects, water and wastewater treatment design, facility retrofit, problem solving, and troubleshooting during construction.

Derya Dursun, PhD, PE

Process Engineer

Dr. Dursun specializes in biosolids treatment and handling and digester gas treatment and management with a focus on maximizing energy recovery. She has broad knowledge of anaerobic digestion, co-digestion, gas production and waste-to-energy facilities. She was the lead process engineer for the BESP and BESP Phase 1 Design projects. Derya is coauthor of Water Environment Federation's (WEF) Manual of Practice – Conditioning Section and Environmental Protection Agency's (EPA) Process Design Manual for Sludge Treatment and Disposal – Sludge Transport and Conveyance Section.

Bryan Lisk, PE

Cogeneration/Energy Balance

Mr. Lisk serves as Hazen's National Energy Services Lead, is a Certified Energy Manager with the Association of Energy Engineers (AEE) and has extensive experience in projects involving generating electricity from alternative renewable energy sources. These projects include Combined Heat and Power (CHP) studies and design, biogas utilization master planning, energy optimization studies and master planning, energy modeling, energy procurement optimizations, and electric utility interconnection coordination. Bryan led GSD's Biogas Utilization Preliminary Study and the basis of design for the combined heat and power (CHP) system for BESP Phase 1 Design.

Sara Head

Regulatory / Permitting

Ms. Head is an experienced air quality professional with years of experience working with a number of air quality control boards on Annual Emissions Report (AER) preparation, Continuous Emission Monitoring Systems (CEMS), New Source Review (NSR) permitting and Best Available Control Technology (BACT).

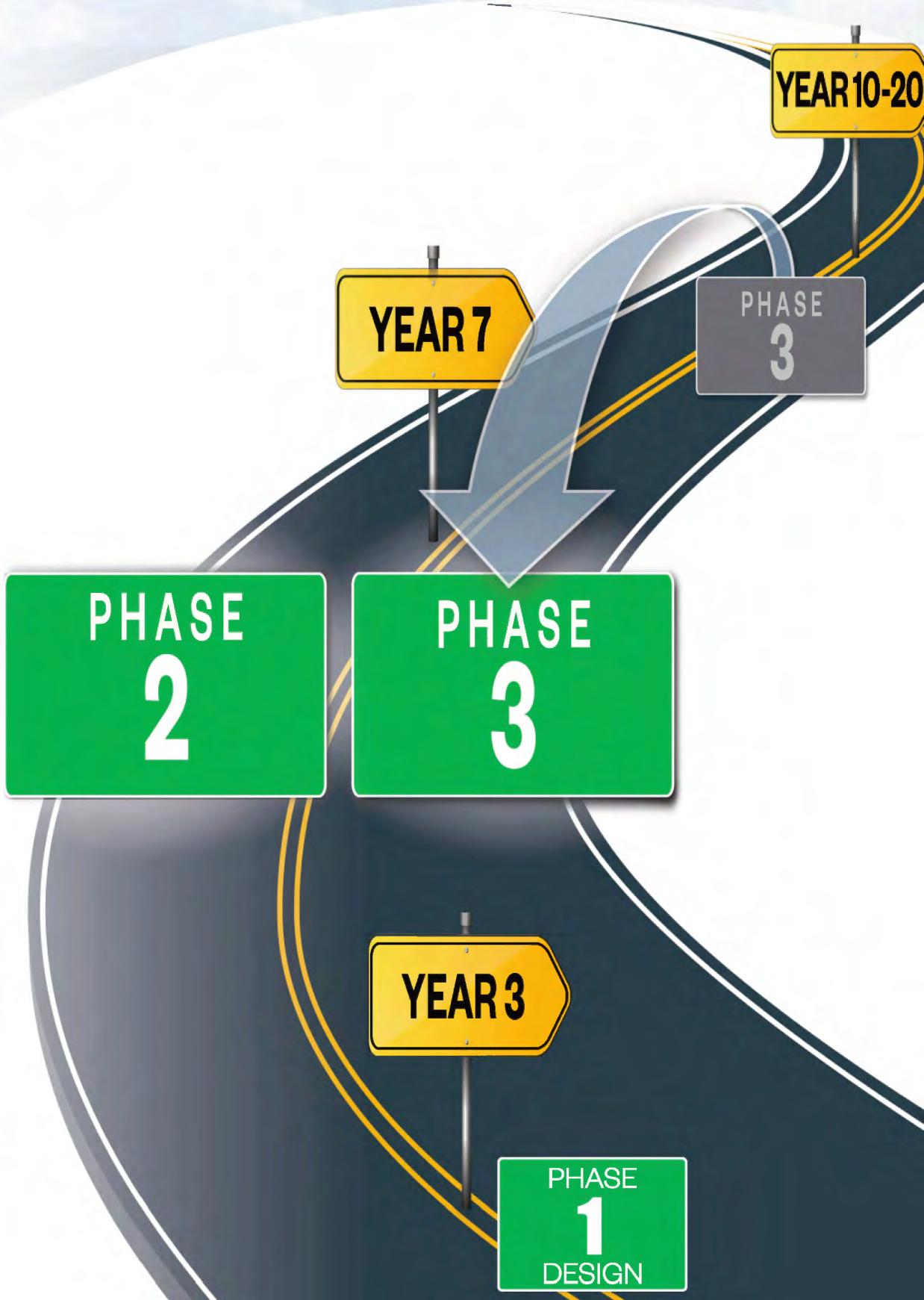
Heather McDaniel McDevitt

Archaeologist

Heather McDaniel McDevitt is an archaeologist and cultural resources lead with 13 years' cultural resource management (CRM) experience throughout California and Baja California. Ms. McDaniel McDevitt has served as a field supervisor, lab director, principal investigator and project manager on Phase I, Extended Phase I, Phase II, and Phase III projects conducting surveys, testing, site significance evaluations and recordation, data recovery and laboratory analysis. Her education encompasses archaeology, biological anthropology, and GIS.

Section 3

Relevant Reference Projects



Section No. 3

Relevant Reference Projects

There are many challenges to realizing success in designing a new Fats, Oil & Grease (FOG) receiving station and thermal dryer in an existing treatment plant. Many of these challenges can be anticipated simply based on the engineering process during design. However, many challenges must be addressed based on past experience with similar projects. Hazen has designed a number of FOG receiving stations and thermal dryers that have been successfully implemented. Relevant projects in which some of our team members participated are described on the following pages.

South Cary Water Reclamation Facility Biosolids Management Facilities

Public Works and Utilities, Cary, NC

Hazen was engaged by the Town of Cary to design a biosolids dewatering and thermal drying facility at the South Cary Water Reclamation Facility (SCWRF). The facility will provide biosolids dewatering, thermal drying and biosolids pelletization capacity sufficient to meet the sludge production demands associated with both the 12.7-mgd South Cary and 12.0-mgd North Cary Water Reclamation Facilities.

Reference

Jarrod Buchanan
Facility Manager
Town of Cary
Utilities Department
Jarrod.buchanan@townofcary.org
(919) 779-0697

The project included preliminary engineering evaluations and detailed design services. Detailed design services were provided to develop construction documents for the biosolids dewatering and thermal drying facilities. Hazen was responsible for all aspects of the construction documents including the civil, mechanical, structural, architectural, electrical and instrumentation disciplines. Construction documents, plans and specifications, were prepared for regulatory review and approval and bidding. The major unit process systems provided in the project included the following:

- Two new 2200 dry pounds per hour high solids dewatering centrifuges including dewatered cake conveyance, sludge feed pumping, and emulsion polymer storage, preparation and polymer solution pumping equipment. The biosolids dewatering system is designed such that a single centrifuge is capable of feeding the thermal dryer equipment at its design loading rate for a "duty-standby" level of redundancy in the dewatering unit process. Capability is also provided for truck loading of dewatered cake for off-site disposal in the event of an extended thermal dryer system shutdown for process reliability purposes.
- One new rotary drum thermal drying system with an evaporative capacity of 8,800 pounds per hour and pelletizing system. The rotary drum drying system includes wet and dry product storage; wet and dry material conveyance; solids separation and cooling; gas-liquid separation and cooling; and exhaust gas scrubbing subsystems.
- Ancillary systems included within the scope of the project included chemical storage and feed facilities for centrate soluble phosphate treatment; filtered plant effluent pumping for cooling water; filtrate and centrate collection and pumping; and off-site liquid sludge receiving facilities.
- Prepared applications for the NPDES Authorization to Construct, Air, and Residuals Distribution permits required by North Carolina regulatory authorities.

North Oconee Water Reclamation Facility Thermal Dryer

Athens-Clarke County Public Utilities Department (PUD), Athens, GA

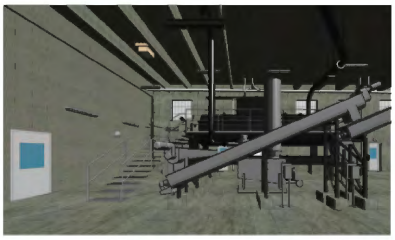
In 2019, Hazen performed a technology evaluation to select the appropriate solids handling technology for PUD's 14-mgd North Oconee WRF. Currently, Hazen is developing design documents for a 26,000-dry ton per day Class A biosolids drying facility. The natural-gas facility will dry sludge to approximately 90% dry solids and will reduce ACC PUD's landfill disposal costs. Hazen is scheduled to perform construction management services upon completion the design.

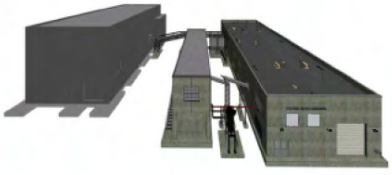
Hazen provided the following services:

- Conceptual/Preliminary Engineering
- Detailed Design
- Permitting
- Cost Estimating
- Bid Phase Assistance
- Construction Administration
- Resident Observation

Reference

Hollis Terry
Environmental Engineer
Athens-Clarke County Public Utilities Department
(706) 613-3470
hollis.terry@accgov.com





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Reference

Robert L. Harris, Jr., PE
Operations Process Engineer
Gwinnett County Government
(678) 376.6927
robert.harris@gwinnettcounty.com

F Wayne Hill Water Resource Center (WRC) Fats, Oil & Grease Receiving Station

Gwinnett County, GA

Hazen was the Design Engineer for the Design/Build delivery of the F. Wayne Hill WRC, the largest and most technologically advanced WWTP in Gwinnett County. The plant processes approximately 40 – 60 MGD of wastewater. This 4th project with the Owner allows the plant to receive fats, oils, grease and high strength waste resulting in more efficient methane gas for the gas-to-energy project.

The Design Build team's responsibilities included managing the design schedule and budget; market survey and business case evaluations of various high strength waste streams; characterization and evaluation of the digester gas production potential of external waste streams through bench-scale digestibility studies; and construction management and start-up.

The project consisted of the following:

- Installation of approximately 1,000LF of 4" and 6" Glass Lined Ductile Iron Pipe with Victaulic Connections
- Installation of approximately 150 LF of 16" FRP Ductwork
- Installation of four 20,000 gallon SST Tanks
- Demolition of existing odor control equipment
- Construction of four 12' diameter x 24' tall SST FOG & HSW storage tanks
- Construction of new septage receiving station
- Grease trap
- Modifications to the existing hot water loop piping and existing sludge lines
- Installation of new sludge handling piping
- Instrumentation & controls

This project was funded under the American Reinvestment and Recovery Act (ARRA) requiring strict guidelines. The EPA office was an integral part of the project.

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East Central Regional WRF Biosolids Improvements

West Palm Beach, FL

The 70-mgd ECRWRF serves five municipalities in Palm Beach County. The Board commissioned Hazen to evaluate and design processes and technologies to improve solids destruction and dewatering performance; to maximize the potential for energy recovery; and to identify a reliable and cost-effective solution to ultimate biosolids treatment and beneficial use. The recommended solution includes new facilities for temperature-phased anaerobic digestion (TPAD), septage and FOG receiving, FOG dosing to the new digesters for co-digestion, and high-solids centrifuge dewatering.

The Septage and FOG Receiving Facilities were designed as a secure complex on the east edge of the plant site so that haulers can only access the stations from outside the plant boundary, while plant personnel can access the stations from inside the plant boundary for operation and maintenance. An SFOG Attendant Building houses ECR staff to monitor haulers.

Septage Receiving Facilities have a total capacity of 170,000 gallons per day and consist of two septage treatment units and a treated septage transfer pump station. Each treatment unit includes a rotating drum screen and an aerated grit chamber. Septage treatment units were sized to accept the maximum unloading rate of haulers' trucks and are equipped with larger, robust screens to handle higher solids loadings.

FOG receiving facilities include a heated and mixed receiving/storage tank and transfer pumps to inject FOG into a recirculated sludge loop from each mesophilic digester. A dedicated hot water system allows operators to periodically flush FOG piping between offloading events. Co-digestion of FOG reduces impacts of FOG to liquid stream treatment and increases available biogas energy for beneficial use.

Reference

Brian Shields, PE
Board Vice Chairperson East Central Regional Water Reclamation Facility Operations Board
(561) 586-1710
bshields@lakeworth.org
richard.schoeck@gwinnettcounty.com

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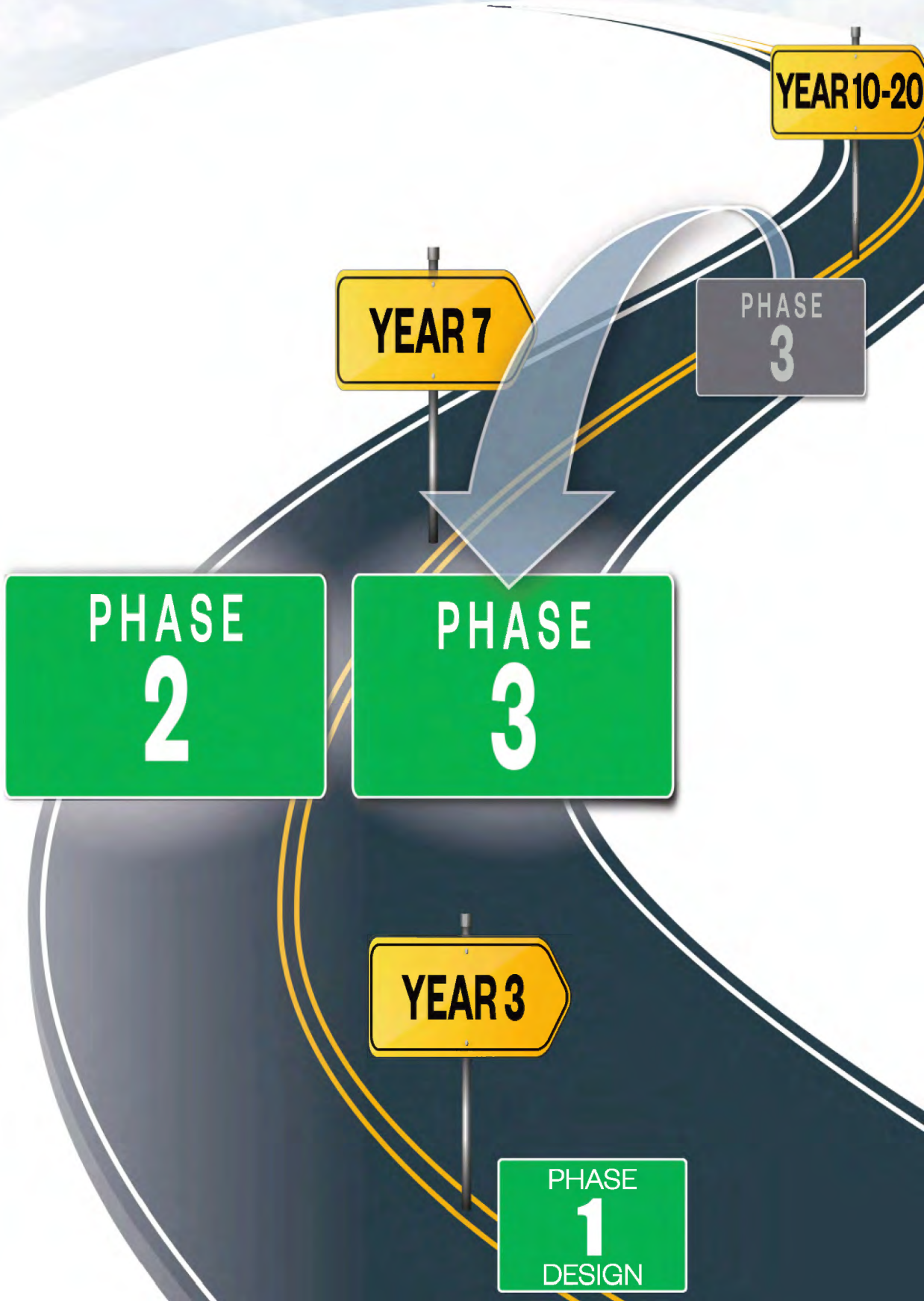
Section 4

Project Fee



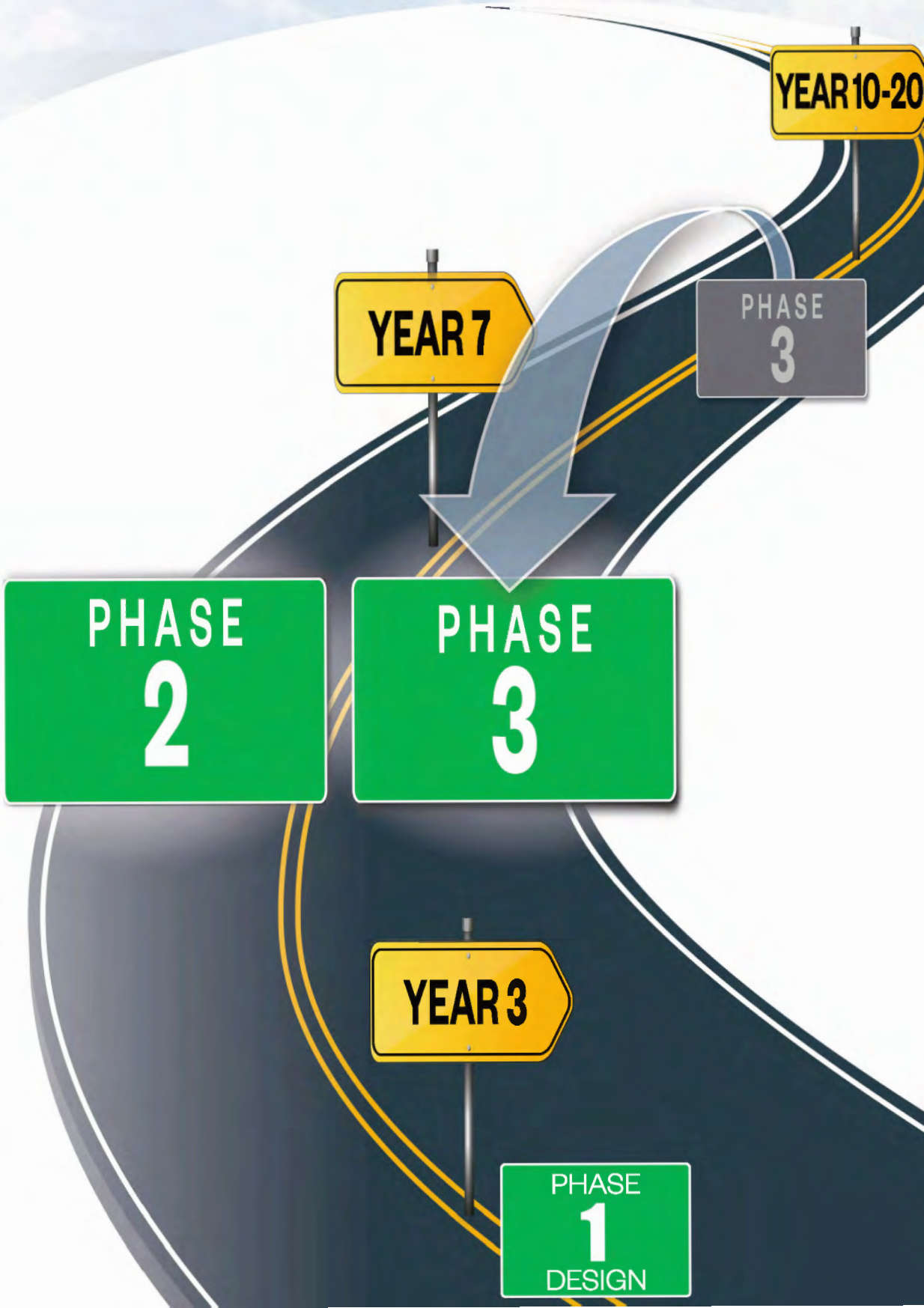
Section No. 4

Project Fee

Hazen	PIC	PM	QA/QC	QA/QC	Design Manager	FOG Task Lead	Thermal Dryer Task Lead	Process Lead	Energy Lead	Mechanical	Electrical	I&C	Proc/Mech	Civil	HVAC	Structural	Architecture	Cost Estimating	CAD	Support Engineer	Support Engineer	Total Hours	Hazen Fee	ODCs	Yorke	Dudek	Ninyo and Moore	Tartaglia	Total
	Solomon	Merlo	Abu-Orf	Bullard	Mackenzie	Hardy	Vavonese	Dursun	Lisk	Reisinger	Yao	Mlakar	Munson	Cummings	Alhajri	DuPuis	Russell	Portner	Panez	Lau	Takada								
Task Description	$280	$280	$280	$280	$280	$280	$210	$230	$270	$230	$280	$220	$180	$280	$260	$210	$250	$215	$165	$150	$150								
1.0 Project Management	**25**	**106**	**4**	**0**	**4**	**4**	**4**	**4**	**4**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**167**	**$45,000**	**$1,000**	**$0**	**$0**	**$0**	**$0**	**$46,000**
1.1 Kickoff Meeting	4	8	4		4	4	4	4	4	4											8		$11,680	$1,000					$12,680
1.2 Project Coordination	16	80																					$26,880						$26,880
1.3 Monthly Progress Reports	5	18																					$6,440						$6,440
2.0 Document Review	**0**	**2**	**0**	**0**	**4**	**4**	**4**	**4**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**22**	**$5,480**	**$0**	**$0**	**$0**	**$0**	**$0**	**$5,480**
2.1 Document Review		2			4	4	4	4		4													$5,480						$5,480
3.0 Project Definition	**0**	**12**	**0**	**0**	**0**	**8**	**20**	**78**	**8**	**40**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**130**	**296**	**$58,600**	**$0**	**$0**	**$0**	**$0**	**$0**	**$58,600**
3.1 Dewatering		4					8	30		20											30		$18,800						$18,800
3.2 Thermal Dryer		4					12	40	4	20											80		$30,520						$30,520
3.3 FOG Receiving		4				8		8	4												20		$9,280						$9,280
4.0 Regulatory/Permitting	**0**	**16**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**16**	**$4,480**	**$0**	**$14,624**	**$21,750**	**$0**	**$0**	**$40,854**
4.1 Emission Calculation and Regulatory Support		4																					$1,120		$14,624				$15,744
4.2 Biological Resources		4																					$1,120			$3,420			$4,540
4.3 Cultural Resources		4																					$1,120			$11,850			$12,970
4.4 Geology, Hydrology, Mineral, Paleontology for MND		4																					$1,120			$6,480			$7,600
5.0 Preliminary Design Report	**0**	**14**	**6**	**6**	**20**	**16**	**16**	**20**	**10**	**20**	**16**	**20**	**12**	**6**	**6**	**12**	**12**	**12**	**40**	**60**	**60**	**384**	**$79,600**	**$0**	**$0**	**$0**	**$0**	**$0**	**$79,600**
5.1 Draft Report		10	4	4	12	8	8	12	8	12	12	16	8	4	4	8	8	10	32	40	40		$53,590						$53,590
5.2 Final Report		4	2	2	8	8	8	8	2	8	4	4	4	2	2	4	4	2	8	20	20		$26,010						$26,010
6.0 Basemapping and Site Investigations	**0**	**2**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**10**	**0**	**0**	**20**	**$4,450**	**$0**	**$0**	**$0**	**$34,479**	**$30,784**	**$69,713**
6.1 Basemapping and Site Survey														4					10				$2,770					$16,288	$19,058
6.2 Geotechnical Investigation		2			4																		$1,680				$34,479	$14,496	$50,655
7.0 30% Design Preparation	**6**	**16**	**4**	**12**	**48**	**17**	**17**	**8**	**4**	**46**	**47**	**38**	**19**	**12**	**10**	**10**	**24**	**110**	**163**	**167**	**83**	**861**	**$172,955**	**$2,000**	**$0**	**$0**	**$0**	**$0**	**$174,955**
7.1 30% Design Submittal	4	10	4	12	40	13	13	4	4	46	47	38	19	12	10	10	24		163	167	75		$140,745	$1,000					$141,745
7.2 Workshop	2	4			4	4	4	4													8		$6,880	$1,000					$7,880
7.3 Construction Cost Estimate		2			4													110					$25,330						$25,330
Optional Services																													
8.0 Regional Biosolids Facility Analysis	**6**	**18**	**4**	**0**	**8**	**0**	**2**	**56**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**28**	**132**	**$29,840**	**$1,000**	**$0**	**$0**	**$0**	**$0**	**$30,840**
8.1 Alternatives Development	2	12			4		2	40	2									8			8		$18,120	$500					$18,620
8.2 Workshop	2	2			4			4															$3,160	$500					$3,660
8.3 Technical Memorandum	2	4	4					12													20		$8,560						$8,560
9.0 Additional Permitting	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**$2,240**	**$0**	**$0**	**$145,000**	**$0**	**$0**	**$147,240**
9.1 Coastal Development Permit		4																					$1,120			**$25,000**			$26,120
9.2 Data Recovery (Phase III) Excavations		4																					$1,120			**$120,000**			$121,120
Total (Base Services)	**31**	**168**	**14**	**18**	**80**	**49**	**61**	**114**	**26**	**114**	**63**	**58**	**31**	**22**	**16**	**22**	**36**	**122**	**213**	**227**	**281**	**1766**	**$370,565**	**$3,000**	**$14,624**	**$21,750**	**$34,479**	**$30,784**	**$475,202**
Total (With Optional Services)	**37**	**194**	**18**	**18**	**88**	**49**	**63**	**170**	**28**	**114**	**63**	**58**	**31**	**22**	**16**	**22**	**36**	**130**	**213**	**227**	**309**	**1906**	**$402,645**	**$4,000**	**$14,624**	**$166,750**	**$34,479**	**$30,784**	**$653,282**

Appendix A

Resumes



Rion Merlo, PhD, PE, PMP

Project Manager

Rion is an environmental engineering consultant with 25 years of experience in the water and wastewater sectors.

Education

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

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

B.S., Microbiology, University of California, Santa Barbara

Certification/License

Professional Engineer

Project Management Professional

Areas of Expertise

- Wastewater treatment
- Water reuse

Professional Activities

- WEF, PMI

Rion began his career focusing on wastewater process engineering and has been involved in pilot studies, master planning, and detailed design. In recent years, Rion brings a wide range of experience in technical solutions and team leadership.

Enhanced Treatment & Site Upgrade (ETSU) Program, Union Sanitary District, Union City, CA

Process Engineer. The Union Sanitary District (District) has embarked on the $335M Enhanced Treatment and Site Upgrade (ETSU) Program which will result in increased plant capacity, replace ageing infrastructure, future nutrient removal and provide flexibility for wet weather discharge to the San Francisco Bay. The program includes aeration basin modifications to convert from carbon removal to biological nutrient removal, a new eighth aeration basin, new secondary clarifiers, new RAS/WAS pump station, new effluent facilities (chlorination, dechlorination, effluent pump station, wet weather discharge pump station, recycled water pump station and elutriation water pump station) new carbon odor scrubbers, new primary effluent equalization and a new administration building. The project included extensive hardening of the electrical infrastructure to accommodate the future loads and provide electrical redundancy. In addition to design, Hazen is providing permitting, CEQA development, and financing application support for the multi-phase program.

Delta Diablo Master Plan, Antioch, CA

Technical Advisor for the development of a Master Plan for its Resource Recovery Facility (RRF). The scope of the master plan includes every facet of treatment at the RRF, including: influent conveyance, optimization of existing processes, biosolids processing and recycled water distribution. The goal of the plan is to identify near- and long-term capital improvement projects which achieve the requirements developed during the master plan.

Main Wastewater Treatment Plan Master Plan, East Bay Municipal Utility District, Oakland, CA

Technical Advisor. Rion directed the capacity assessment of all treatment processes at the Main Wastewater Treatment Plant. He developed both short-term and long-term solutions to improve performance and increase capacity. He helped develop a roadmap to the future that addresses future nutrient regulations and capacity limitation.

Hazen

Advanced Treatment Technology Pilot Study, Sacramento Regional County Sanitation District, Elk Grove, CA
Process Engineer. SRCSD is required to meet stringent NPDES permit requirements by December 2021, specifically regarding ammonia and nutrients. The technologies that were tested included air activated sludge (AAS) for nitrogen removal, followed by tertiary filtration and disinfection. Granular media filtration (GMF), GMF with pre-ozonation and membrane filtration were identified as viable tertiary filtration technologies; and chlorination, ozonation and UV disinfection were the identified disinfection technologies. Rion led a team of eight operators, including a District operator, and oversaw all operations and data collection for the Pilot Project. Rion led weekly meetings with the District, District's consultants and BC team members to present results and discuss data interpretation. The findings from the pilot study have led to a program savings of over $200 million. The pilot project was awarded the California Water Environment Association (CWEA) Sacramento Area Section Research Achievement Award, CWEA State 2013 Research Achievement Award and 2014 WERF Award for Excellence in Innovation.

Aeration Tanks Rehabilitation Condition Assessment and Alternatives Analysis, City of San José, CA
Process Task Lead. Rion led the alternatives analysis as part of the aeration tanks rehabilitation project at the Regional Wastewater Facility. The alternatives analysis included developing design criteria, field testing, process model development and a business case evaluation. Alternatives that were considered were selected to meet current and potential future regulations for nutrients and to provide flexibility for future unknowns.

Nitrate Reduction Study, City of Roseville, CA
Project Manager. Rion managed a study to evaluate optimization and upgrade alternatives to meet nutrient compliance requirements at the City of Roseville's Dry Creek WWTP for nitrate plus nitrite. The recommendations included an acetic acid system, modification to internal mixed liquor recycled pumps, aeration upgrades and control of solids processing return streams. These upgrades have been implemented and the facility is in compliance.

Main Wastewater Treatment Plan Master Plan, East Bay Municipal Utility District, Oakland, CA
Process Engineer. Rion directed the capacity assessment of all treatment processes at the Main Wastewater Treatment Plant. He developed both short-term and long-term solutions to improve performance and increase capacity. He helped develop a roadmap to the future that addresses future nutrient regulations and capacity limitation.

Truckee Meadows Water Reclamation Facility (TMWRF) Facilities Plan, City of Reno, NV
Process Engineer. The TMWRF discharges treated effluent to the Truckee River which requires low levels of nitrogen and phosphorus. Rion performed the capacity assessment of the TMWRF to identify capacity limitations. In addition, he helped to develop alternatives for all existing treatment facilities at the plant.

Master Plan Update, City of Hayward, CA
Process Engineer. The project provided an opportunity to evaluate existing operations and identify optimization opportunities. Rion performed a flows and loads evaluation and evaluated all major liquid stream processes at the plant. The plant includes primary clarification, trickling filter/solids contact process and chlorine disinfection. In addition, Rion performed preliminary sizing for future facilities for nitrification (nitrifying trickling filters) and denitrification (denitrification filters).

Marc S. Solomon, PE, BCEE, D.WRE

Project Director/QC

Mr. Solomon is an accomplished project manager on a wide range of pump station projects.

Marc's broad project experience has exposed him to all phases of project planning, design, system modeling, system controls, construction management, and operational reliability. This unique and diverse experience enhances his project management abilities and his ability to work effectively with project teams and externally with elected officials, engineers, operators, contractors, and the general public.

Goleta Biosolids & Energy Strategic Plan, Goleta Sanitary District, Goleta, CA

Marc provided Quality Control and Quality Assurance for Biosolids and Energy Plan. The project included the evaluation of High Strength Waste availability and capacity assessments for a 10-mgd facility for current and future demands including high strength waste additions. The assessment included the investigation of existing mesophilic digesters and dewatering units and biogas generation potential of the facility.

Goleta Asset Management Plan and 10 Yr CIP Project, Goleta, CA

Hazen prioritized the collection system rehabilitation and replacement (R&R) and CCTV activities for the District based on a risk-based approach considering desktop analysis of pipe condition, remaining useful life and consequence of failure. Services included reviewing the CCTV inspection database provided by the District and developing a mapping logic to convert Hanzen and POSM coding to NASSCO PACP grades and developed a risk-based prioritization process that combines structural grades, service defects, remaining useful life and criticality of pipe segments. InfoMaster was used to verify the CCTV data conversion. The results of the risk-based prioritization of the District's sewer system pipe segments will be used to develop long term rehab and replacement funding needs. Marc served as the Quality Assurance/Quality Control for the 10 Yr CIP Development Project for both the collection system and wastewater treatment plant.

Southeast Water Pollution Control Plant Total Residual Chlorine Study, San Francisco Public Utilities Commission, CA

Marc served as Project Manager for the study of alternatives to manage total chlorine residuals at the Southeast WWTP, which treats up to 150-mgd secondary effluent and during wet weather up to an additional 100-mgd disinfected primary effluent. Alternatives evaluated in Phase 1 of the study included optimization of existing disinfection process with sodium hypochlorite and dechlorination with sodium bisulfite, bench scale testing of effectiveness of peracetic acid, bench scale tests of chlorine residual decay, and feasibility of UV disinfection.

Education

BS, Civil Engineering, Duke University, North Carolina

MS, Public Health, Tulane University, Louisiana

Certification/License

Professional Civil Engineer

Water Treatment Plant Operator

Water Distribution System Operator

AAEE Board Certified Environmental Engineer

ASCE Diplomat, Water Resource Engineer

Value Engineering Certification

OSHA Confined Space Entry

Professional Activities

Water Environment Federation

AWWA

American Society of Civil Engineers

American Academy of Environmental Engineers

WateReuse Association

Laguna Treatment Plant Disinfection Project, Santa Rosa, CA

Initially, the City hired Mr. Solomon as Project Manager to evaluate the disinfection options for the Laguna Treatment Plant, a 69-mgd Title 22 plant. As Project Manager and facilitator, Marc analyzed disinfection options (UV, Hypochlorite, Ozone, Peracetic Acid, and Pasteurization) using multi-criteria decision analysis. The process included 19 alternatives and 15 stakeholders, and utilized a Triple Bottom Line Plus BCE process.

After selection of two options, the City proceeded to pre-design of the options and pre-selection of the preferred UV system with Marc as Project Manager. Marc is currently serving as Project Manager for the detailed design. Once complete the new UV system will the the largest Title 22 UV system in the country.

Delta Diablo Master Plan, Antioch, CA

Marc is the Project Manager in charge for the development of a master plan for its Resource Recovery Facility (RRF). The scope of the master plan includes every facet of treatment at the RRF, including: influent conveyance, optimization of existing processes, biosolids processing and recycled water distribution. The goal of the plan is to identify near- and long-term capital improvement projects which achieve the requirements developed during the master plan.

Vallejo Flood and Wastewater District, Wastewater Treatment Plant Master Plan, Vallejo, CA

Marc is the Project Manager for the evaluation of biosolids alternatives and nutrient removal alternatives for the Vallejo Flood and Wastewater District. The project includes whole plant sampling, development of a calibrated process model and biosolids alternative scenarios. The goal was to understand the nutrient removal and biosolids options with the existing infrastructure and identify process needs to meet future limits.

Secondary Treatment Plant Upgrade Master Plan, Union Sanitary District, Union City, CA

Marc is the Project Manager for the Secondary Treatment Improvement Project. The purpose of the project is to develop a unified approach to secondary treatment upgrades at the Alvarado WWTP that will both increase capacity in the near-term while addressing anticipated nutrient limits to allow discharge to the Old Alameda Creek. Two alternative approaches were evaluated: conventional activated sludge and MBR along with side-stream treatment. Hazen is providing process analysis of the existing WWTP to confirm that additional capacity, with nutrient removal, can be obtained from the existing facility to meet the District's near-term needs. Hazen also determined the most efficient approach to expanding the treatment plant for long-term capacity and future nutrient requirements. This $350M project is currently in the design phase.

Wastewater Treatment Plant Master Plan, Santa Rosa, CA

Santa Rosa owns and operates a 22-mgd Title 22 treatment plant and exports approximately 60% of the Title 22 recycled water to Calpine to recharge the Geysers Steamfield. Marc has been providing consulting services to Santa Rosa for over 20-years. Mr. Solomon provide oversight and facilitated a series of workshops for the WWTP Master Plan.

Skyfarm 'A' and Hansford Court Lift Station Reconstruction, City of Santa Rosa, CA

Hazen was selected to provide a condition assessment, alternative analysis, detailed design and design services during construction for reconstruction of two of the City of Santa Rosa's wastewater lift stations. The lift stations were destroyed in the 2017 Tubbs fire. The reconstruction included replacement of existing lift station structures, pumps, electrical service, and associated electrical, mechanical and control components along with provisions for temporary pumping and power to ensure uninterrupted wastewater service to the surrounding residents. Since these lift stations were destroyed as part of a natural disaster, the design also required collaboration and coordination with the City and FEMA to comply with federal funding requirements.

Ian Mackenzie, PE

Design Manager

Ian is a civil engineer with more than 30 years' experience in water and wastewater projects. He provided technical expertise to the condition assessment of the Rio Hondo Pumping Station which is the precursor to the present project. He has lead numerous design projects for water, wastewater and recycled water.

Education

B.Sc., Civil Engineering, Queen's University (Canada)

Certification/License

Professional Engineer

Areas of Expertise

- Design and construction of wastewater/water treatment plants
- Design and construction of wastewater collection systems
- Preparation of construction contracts

Professional Activities

California Water Environment Association – WEF Delegate Director

Biosolids Loadout Condition Assessment, Eastern Municipal Water District, Perris, CA

Project Manager. The biosolids loadout facility at the PVRWRRF has experienced failure of several components including loadout gates and loadout measurement cells. These failures have necessitated greatly increased operator involvement to keep the facility functioning. Hazen was appointed to evaluate current condition of the facility to recommend improvements that would restore it to reliable operation. Mr. Mackenzie is leading the Hazen team investigating these improvements.

Goleta Collection System Asset Management Program, Goleta Sanitary District, CA

Wastewater Engineer. This project is expanding Goleta Sanitary District's Asset Management program to include all assets in the District's wastewater collection system, including gravity pipelines, lift stations and forcemains. Mr. Mackenzie provided expertise for condition surveys and asset criticality ranking carried out under this project.

Solids Handling Improvements at Plant 3A, Moulton Niguel Water District, Aliso Viejo, CA

Design Manager for this project which will provide a comprehensive upgrade of the solids handling facilities at a 6 mgd wastewater facility. The scope includes digester rehabilitation and equipment replacement for solids thickening, dewatering, gas handling and digester heating as well as associated electrical and controls improvements. Mr. Mackenzie is leading the Hazen team designing these improvements.

Coastal Treatment Plant Facility Improvements, South Orange County Wastewater Authority, Dana Point, CA

Design Lead for final design of facility improvements at SOCWA's Coastal Treatment Plant. The improvements include upgrading the blowers; new Ferric Chloride storage and feed system; replacement of secondary sedimentation tank equipment; relocation of the drainage pump station;

Hazen

implementation of new safety improvements including fall protection; and preparation of an CEQA documents. Project Engineer responsibilities include designing a new ferric chloride storage and feed system, overall site plan, and grading and paving plans

JB Latham Treatment Plant Miscellaneous Improvements, South Orange County Wastewater Authority, Dana Point, CA

Mr. Mackenzie was responsible for process mechanical design condition of improvements to this 13 mgd wastewater treatment facility. The project included improvements to the existing grit basins, replacement of the plant standby generator, effluent valves and effluent flow meters. The project was carefully coordinated with plant maintenance and operating staff to ensure that all improvements could be carried out with minimal impact on operations.

LASAN Modeling Roadmap

This project investigated available software to expand the capabilities of LASAN's hydraulic modelling group. New applications evaluated included odor modelling, sediment transport modelling, wastewater process modelling and collection system water quality modeling. Mr. Mackenzie served as Project Manager for this project and was responsible for coordinating the investigation and producing the final report.

Influent WetWell and Headworks Screening Project, Town of Windsor, CA

Mr. Mackenzie served as process lead for this project which upgraded the 2mgd Windsor Wastewater Reclamation Plant. The project evaluated replacement of the facility's existing fine screen and grit removal facilities as well additional upstream protection to resolve clogging issues at the influent pumping station.

Rio Hondo Recycled Water Pump Station Condition Assessment, Central Basin Municipal Water District, City of Pico Rivera, CA

Assessment Lead. Mr. Mackenzie was responsible for condition assessment of mechanicalequipment and civil and structural components of this 15,000 gpm recycled water pumping station. The Condition Assessment included the pumps, pipes, valves, electrical equipment and the hydraulic performance of the pumps. The Condition Assessment used a matrix approach for each asset (86) to determine the remaining useful life and to prioritize the elements needing replacement immediately and over the next 5 years such as the large pump VFDs, one of the electrical transformers, some valves and a drain sump pump. CBMWD will use this Condition Assessment to evaluate their plans going forward to either update the pump station or replace it and add capacity for their future demands.

Vertical Facilities Asset Inventory and AM Framework Pilot Project, Laguna Hills, CA

Project Engineer. Assisted the team with the inventory and condition assessment of a lift station, a pump station, a reservoir and a pressuring regulating facility as part of the asset management pilot project. The purpose of the pilot project was to develop an asset inventory for a representative sample of Moulton Niguel Water District's vertical assets to provide a basis for planning the development of a broader asset management system.

Glenoaks Pump No. 1 Replacement Project, City of Glendale, CA

QA/QC for preparing the plans, specifications and estimates the replacement of Pump No. 1, a 125 hp, 4160 volt 875 gpm centrifugal pump that has outlived it useful life. The pump was replaced in kind in the Glenoaks Pump Station (2018). The pump serves the 1290 pressure zone in the Glenoaks Canyon area. Pump No. 1 serves the daily flow condition for the 1290 pressure zone. Pump No. 2, a 250 hp, 4160 volt, 2,000 gpm centrifugal pump, which was recently replaced, will serve as the high demand pump. The work included a hydraulic analysis Technical Memorandum used for pump selection and a review of the hydraulic performance of the pumping station. The work also included the engineering services during construction by doing the RFI and Submittal reviews for the City.

Mohammad M. Abu-Orf, PhD

Technical Advisor / QC

Dr. Abu-Orf "Mo" is Hazen's Residuals Group Practice Leader and has over 25 years of experience in the areas of solids dewatering, drying, stabilization, and energy recovery.

Education

PhD, Environmental Engineering, University of Delaware

MS, Environmental Engineering, University of Delaware

BS, Civil Engineering, Birzeit University, West Bank, Palestine

Areas of Expertise

- Residuals
- Biosolids master planning
- Process optimization
- Sludge dewatering
- Energy recovery

Technical Publications

Five patents as the main inventor
More than 125 peer-reviewed and conference publications, and book chapters

Co-author of the fifth edition of the textbook "Wastewater Engineering: Treatment and Resource Recovery," published by McGraw Hill, October 2014

Projects experience involve directing biosolids master planning, biosolids management plans, preliminary and conceptual design of recommended processes, and applying innovative biosolids processing technologies that provide cost effective solids processing, and high quality product. Mo's experience also includes academia, research and development and providing high technical services for a major wastewater private operating corporation. Dr. Abu-Orf has more than 120 publications and 5 patents to his credit. Dr. Abu-Orf co-authored the Fifth Edition of the Textbook "Wastewater Engineering: Treatment and Resource Recovery," published by McGraw Hill in 2014.

Biosolids and Energy Phase I: Preliminary Design, Goleta Sanitary District (GSD), Goleta, CA
Technical Advisor. This project is developing a Preliminary Design Report that includes preliminary design of a new digester and CHP facility, develop cost estimate for these facilities, conduct regulatory and environmental assessment, and provide conceptual layout of all expected facilities for construction.

Biosolids and Energy Strategic Plan, Goleta Sanitary District, Goleta, CA
Technical Director responsible for evaluating high strength waste available for co-digestion at GSD (Phase I) and assessing plant capacity for additional solids loading to anaerobic digesters (Phase II). In addition, the subsequent work from Phase I and II evaluates various technology to enhance digestion and biogas production. The project ultimately leads to developing a strategic plan for GSD in handling biosolids to meet future state regulatory requirement. Additional roles include conducting field interview for market assessment for biosolids residuals from GSD.

Broward County North Regional WWTP Facility Improvements, Broward Water and Wastewater Services, FL
Quality Control Reviewer. Provided quality control review services for the current design of the Phase III (3) Solids project, with an estimated construction cost of $64 million. Improvements include replacement of aging solids thickening, digestion and dewatering equipment, and facilities. The design consists of rehabilitation of the existing, dissolved air flotation system equipment, replacement of five anaerobic digester covers, digester gas mixing systems and piping, and replacement of three belt filter dewatering presses with new belt presses and/or centrifuges.

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Beneficial Use of Digester Gas at Regional Water Reclamation Facilities, Eastern Municipal Water District, CA
QA/QC for the biogas utilization study.

San Francisco Public Utilities Commission, Program Management and Owner's Representative, San Francisco, CA
Three main responsibilities.

- **Biosolids Facility Design Project, Southeast Plant.** Since the selection of the design team for the biosolids project at the Southeast plan in November 2013, responsibilities include: 1) reviewing documents produced by the design team and provide comments for the SFPUC engineering staff, and 2) participating in meetings and decision making workshop for reviewing and selecting biosolids process alternatives.
- **South East Plant Biosolids Project, Preplanning Task Orders, San Francisco, CA.** Overall technical Director for the four biosolids project planning tasks, 1) Biosolids Project Needs Assessment, 2) Biosolids End Use Market Study, 3) Biogas Beneficial Use Study and 4) Project Description. Lead the technical and economic feasibility assessment of co-digesting high strength waste (Fats oils, and grease, green bin and black bin) with the new biosolids digestion facility.
- **San Francisco Public Utilities Commission, Evaluation and Validation of Sewer System Improvement Program, San Francisco, CA.** Technical Director and Task Leader for the biosolids process evaluation and program validation for the San Francisco Public Utility Commission Sewer System Improvement Program. The process evaluation includes reviewing capacity of solids processes at the Bayside and Oceanside Plants including thickening, digestion, and dewatering, and recommending short term process improvement until the biosolids new facility is implemented. Program validation includes evaluating the existing biosolids program management plan and validating long term recommendations.

East Central Regional WWTP, East Central Regional Operations Board, West Palm Beach, FL
Startup Senior Technical Advisor. Provided technical assistance of the startup of the of two-phase, temperature-phased anaerobic digestion (TPAD). TPAD digestion operates as a thermophilic-mesophilic digestion system, or alternatively can operate in conventional all mesophilic mode. Facilities included two fixed-cover thermophilic digesters and four floating cover mesophilic digesters. Digester heating accomplished with hot water boilers and external tube-in-tube heat exchangers and sludge-to-sludge heat recovery HEX units. The project also included rehabilitation of existing GBT thickening building and installation of a new dewatering facility including high solids centrifuges and FOG and Septage receiving and handling facilities.

PAR 1304 2018 Facility Plan, Metro Wastewater Reclamation District, Denver, CO
Technical Director for Solids Stream Processes. Served as a technical director on the 2018 Facility Plan focused on the identification and evaluation of solid stream process alternatives at the 220 mgd Robert W. Hite Treatment Facility (RWHTF) and the 24 mgd Northern Treatment Plant (NTP). Identified with MWRD stakeholders' innovative solutions to capacity constraints and developed a vision toward the future that will provide the greatest benefit to MWRD and their customers. The Facility Plan is a District-wide planning document that encompasses the collection system, treatment plants, and biosolids land application facilities. It was created to identify improvements necessary to meet the planning and regulatory drivers for a 20-year planning period and beyond.

Michael Bullard, PE

Technical Advisor/QC

Mr. Bullard is a national expert in digester gas generation, biogas storage and utilization, as well as, residuals management processes from a planning, design, and operational perspective.

Education

MCE, North Carolina State University

BSCE, North Carolina State University

Certification/License

Professional Engineer

Areas of Expertise

- Residuals and biosolids management
- Digester gas utilization and energy production
- Wastewater treatment facility design
- Wastewater operations process optimization

Professional Activities

Water Environment Federation

- Residuals and Biosolids Committee (Active)
- Specialty Conference Planning Group (2012-2013)

Technical Practice Committee

- MOP-11 – 4th Edition (Reviewer)
- MOP-11 – 5th Edition (Chapter Author)
- WEFTEC Program Committee
- Facility Operations Symposia: 2002-08 (Past Chair)
- Residuals and Biosolids Symposia – 2008 - Current

East Central Regional WWTP Solids Handling Improvements, City of West Palm Beach, FL

Senior Technical Advisor and QA/QC Review. Work included facilities for recapitalization and expansion of gravity belt thickening; installation of new temperature phased (thermophilic – mesophilic) anaerobic digestion stabilization infrastructure to replace aerobic stabilization process infrastructure; new high solids centrifuge dewatering to replace belt filter press dewatering along with FOG and septage receiving and handling facilities.

F. Wayne Hill WRC Solids Handling Upgrade, GCDWR, Gwinnett County, GA

Senior Technical Advisor and QA/QC for detailed design of mechanical thickening upgrades at the 60-mgd WRC. Work included the design of new mechanical thickening facilities including primary and waste activated sludge storage tankage, rotary drum mechanical thickening facilities in an existing thickening area to replace centrifuges for blended primary and secondary sludge thickening, and thickened sludge collection and transmission to anaerobic digestion for subsequent stabilization.

North Oconee WWTP Thermal Dryer, Athens-Clarke County PUD, Athens, GA

Senior Technical Advisor and QAQC Reviewer. Detailed design for a 4,500 pound per hour evaporation rate thermal dryer facility at the North Oconee WWTP. The thermal drying facility includes a Komline-Sanderson 13W-1500 dryer with thermal oil heating and associated equipment for wet cake conveyance, storage, and feed and dried product cooling and conveyance to a new truck loadout facility for dried product loading. The overall project included assisting the Owner in technology evaluation and selection, competitive pre-selection and procurement among indirect style paddler dryer suppliers prior to initiation of detailed design activities for preparation of plans and specifications for a conventional design-bid-build delivery.

Hazen

Technical Papers

Bullard. C. M., Lisk, B. R, and Hardy, S. A., *On-site Energy Production: using Digester Gas in Combined Heat and Power Systems*, Indiana Water Environment Association 76th Annual Meeting, Indianapolis, IN, November, 2012

Bruton, T., Bullard, C. M., Rogers, P., Hardy, S. A., Latimer, R. L., and Porter, R., *Debottlenecking Anaerobic Digester Capacity – Sometimes WAS Thickening Isn't Enough*, Proceedings of the 2012 Water Environment Federation Technical Exposition and Conference (WEFTEC-2012), New Orleans, LA, October 2012

Bullard, C. M. and Van Horne, M. A., *Coming Full Circle: Moving Wastewater Treatment Plants Toward Energy Neutrality*, 2012 Kentucky-Tennessee Water Professionals Conference, Memphis, TN, July 2012

Rohrbacher, J. A., Lisk, B. R., Bullard, C. M., Whitaker, J., Wichser, R. C. , and Frederick, T., *Digester Gas Energy Recovery – Deciding Between Driving Blowers or Making Electricity*, Proceedings of the 2012 WEF Residuals and Biosolids Specialty Conference, Raleigh, NC, March 2012

Lisk, B. R., Dodson, J. J., and Bullard, C. M., *Coordinating Utility Billing Structures to Maximize the Benefit from Biogas Fueled Combined Heat and Power Systems*, Proceedings of the 2012 WEF Residuals and Biosolids Specialty Conference, Raleigh, NC, March 2012

Van Horne, M, Grandstaff, J., Chapman, M., Stone, A. L., Bullard, C. M., Peplinski, D, Long, H., *From Grease to Green: FOG Receiving, Co-Digestion and Combined Heat and Power Generation at the Henrico County, VA Water Reclamation Facility*, 2011 Chesapeake Water Environment Association "TRICON 2011" Meeting, Ocean City, MD, August 2011.

Van Horne, M., Bruton, T., Hardy, S., Bullard, C. M., and Long, H., From Grease to Green: Two Case Studies of FOG Receiving, Co-Digestion, and Combined Heat and Power Generation, Proceedings of the 2011 Water Environment Federation (WEF) Energy and Water Conference, Chicago, IL, August 2011.

South Cary WWTP Dewatering and Thermal Drying Facilities, Town of Cary, NC

Project Engineer. This facility serves dewatering and drying needs for both the 12-mgd North Cary WWTP and the 12-mgd South Cary WWTP. Dewatering improvements consisted of two high solids centrifuges and associated ancillary equipment in a new dewatering facility. Thermal drying facilities included an 8,800 pound per hour evaporation rate with a 2,000 dry pound per hour solids processing facility. Prepared and coordinated air permitting activities for installation of the thermal drying facility. The thermal drying facility was the first of its type in North Carolina.

Hominy Creek WWTP Solids Handling Facility Upgrades, City of Wilson, NC

Project Engineer. Project at the 17-mgd WWTP included gravity belt thickener mechanical thickening for waste activated sludge stream; rehabilitation of existing anaerobic digestion facilities including new digester gas utilization facilities, digester heating and pumping, and mixing systems; and installation of belt filter press sludge dewatering facilities with a Class A alkaline stabilization unit treatment process.

East Central Regional WWTP Biosolids Master Plan Update, City of West Palm Beach, FL

Senior Technical Leader and Engineer. Preparation of an updated biosolids management master plan. Work included the development of raw sludge generation rates for liquid treatment train process configurations both with and without primary clarification for a range from process flow rates from 45 to 70 mgd process flow rates. Solids handling alternatives for thickening, digestion, dewatering and ultimate disposal were evaluated for the full range of process configurations and flow conditions, stabilization alternatives, energy recovery alternatives, and ultimate disposal resulting in the assessment of over 25 different combinations of solids handling and management configurations. The resultant recommended facilities included retaining activated sludge treatment without primary clarification; a recapitalization and expansion of gravity belt thickening; installation of new anaerobic digestion stabilization infrastructure to replace aerobic stabilization process infrastructure; new high solids centrifuge dewatering to replace belt filter press dewatering; and on-site thermal drying.

M'Kean Maffitt WWTP Improvements and Expansion, Cape Fear Public Utility Authority, Wilmington, NC

Senior Technical Advisor and QA/QC. Detailed design of solids handling facilities for expansion to 24 mgd. Project included rehabilitation of existing digesters and construction of new anaerobic digestion facilities; digester gas utilization facilities; and a combined thickening and dewatering facility for centralized solids processing operations.

Scott Hardy, PE, PMP

FOG Receiving Station

With over 25 wastewater solids process field and design projects, Mr. Hardy is the local, responsive lead for solids process support and training. He has performed anaerobic process training, including digester gas handling and hot water systems with heat recovery.

Education

MS, Georgia Institute of Technology

BS, Rensselaer Polytechnic Institute

Certification/License

Professional Engineer

Areas of Expertise

- Thickening/dewatering
- Anerobic digestion
- Codigestion
- Combined heat and power systems

Professional Activities

- Texas American Water Works Association
- Water Environment Association of Texas
- American Water Works Association
- Water Environment Federation

Publications

Hardy, Scott, et al, *"Holistic Approach To Residuals Handling At F. Wayne Hill Water Resources Center: Did The Upgrades Work?"* WEF Residuals and Biosolids Conference, Milwaukee, WI, 2016

F. Wayne Hill WRC Solids Process Evaluation & Training, Gwinnett County, GA

Project Engineer who performed evaluation of the solids treatment processes including co-thickening of primary sludge and WAS, anaerobic digestion, digester gas utilization, combined heat and power system, and centrifuge dewatering. Project also included field optimization of the rotary drum thickeners. Trained both management and operations staff for the nutrient recovery, digester gas handling and treatment, and FOG & HSW co-digestion processes at the 60 mgd advanced WWTP.

T.P. Smith Anaerobic Digester and Thermal Dryer Facilities, City of Tallahassee, FL

Lead Design Engineer who designed and led operations training for a new anaerobic digestion facility consisting of two 1.5 MG anaerobic digesters including hot water heating and digester gas handling systems. Mr. Hardy designed the upgrade of two existing anaerobic digesters and new 11,0000 evaporative lbs/day thermal dryer facility.

Phase II Improvement Study, Rowlett Creek Regional WWTP, North Texas Municipal Water District, Plano, TX

Solids Treatment Technical Lead for evaluating operation and performance of the existing solids treatment train that showed good WAS gravity belt thickening performance and higher than typical solids loading on the existing belt filter presses. Evaluated thickening and dewatering alternatives for optimized landfill hauling operations, reduced odors, cost effectiveness and reliability.

Village Creek WWTP Solids Process Evaluation, Jefferson County, AL

Lead Project Engineer for the evaluation of thickening, anaerobic digesters, centrifuge dewatering and FOG co-digestion. Centrifuge dewatering optimization included evaluation and optimization of feed pumps, polymer system, cake conveyors, cake pumping, and lime stabilization system. The digester upgrades included new hot water and digester heating systems, new pumped jet mixing system, digester gas piping replacement, and electrical/HVAC upgrades to meet current building codes.

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East Central Regional Water Reclamation Facility (WRF) Biosolids Improvement Project, Palm Beach County, FL
Senior Technical Reviewer for the design of a new FOG and septage receiving facility. FOG receiving facility includes terminal access software, pumped truck unloading with rock trap and grinder, storage, mixing, heating and feeding FOG to digested sludge recirculation system. Septage receiving consists of terminal access software, two complete plants consisting of screening and grit removal. Both facilities are odor controlled.

PTAR Cañaveralejo Wastewater Treatment Plant (WWTP) Upgrade, City of Cali, Columbia
Lead Solids Process Engineer for the evaluation and expansion of the existing solids treatment train with the addition of secondary process train at this 120 mgd primary treatment only WWTP. Mr. Hardy evaluated the current primary sludge treatment process of gravity thickening, anaerobic digestion with two 1,000 kW combined heat and power systems, belt filter press dewatering and solar greenhouse drying. With the addition of secondary treatment process, Mr. Hardy also evaluated expansion of solids train with waste activated sludge pre-treatment alternative analysis to increase digester gas production for greater power production.

Valley Creek Wastewater Treatment Plant (WWTP) Energy and Process Optimization Study, Jefferson County, AL
Principal Investigator for the anaerobic digester optimization study. The seven existing digesters showed limited volatile solids destruction and foaming issues. Mr. Hardy recommended cleaning the digesters and installing a pumped mixing system to help restore and maintain active digester volume, installing automatic feed system with automatic valve and magnetic flow meters to evenly load the digesters and improvements to the hot water system control to provide uniform digester heating.

Willow Lake Water Pollution Control Facility – FOG Codigestion Feasibility Study, Salem, OR
Lead technical engineer for the preliminary design of hauled waste (FOG and septage) receiving facility, including card access system, screening, analyzers for pH. Evaluated multiple locations at the Willow Lake WPCF taking into account traffic patterns, truck staging areas, operator access, security, and distance to discharge. Project also include digester capacity evaluation,

Heat Tracing and Insulation Project, Denton Creek Regional Wastewater System, Trinity River Authority of Texas, Roanoke, TX
Project Manager for the assessment, preliminary and detail design, and bidding of heat tracing and insulation systems at the wastewater treatment facility. Includes updating controls, thermostat locations, and positive feedback tied to SCADA to confirm heat tracing operation.

Vindobona Wastewater Treatment Plant (WWTP), Quito, Ecuador
Lead Design Engineer for the design of a new anaerobic digestion facility for the 270 mgd peak flow wastewater treatment plant that includes eight 6,500 m3 anaerobic silo digesters, pumped mixing system, heating system, gas storage, and waste gas burners.

F. Wayne Hill Water Reclamation Center (WRC) Co-Thickening Project, Gwinnett County, GA
Project Manager for the design of rotary drum thickener (RDT) system for co-thickening primary sludge and waste activated sludge to increase existing digester capacity. Design included holding tanks for both primary sludge and WAS, chopper feed pumps for six RTD, and six four-stage progressive cavity pumping system. New foul air collection system and biological scrubber odor control system for thickening and dewatering area, primary sludge holding tank and fats, oils and grease (FOG) receiving facility. Odor control system included space and fan capacity for future carbon polishing. (2010)

Derya Dursun Balci, PhD, PE

FOG Receiving Station

Dr. Dursun is Hazen's West Region Biosolids Lead. Her experience includes planning, process modeling, and preliminary and final design of solids handling facilities.

Education

Ph.D, Civil/Environmental Engineering, University of Delaware, Newark, DE

M.S., Environmental Engineering, Dokuz Eylul University, Izmir, Turkey

B.S., Environmental Engineering, Dokuz Eylul University, Izmir, Turkey

Certification/License

Professional Engineer

Areas of Expertise

- Solid/liquid separation
- Wastewater treatment
- Biosolids management

Professional Activities

Water Environment Federation (WEF)

International Water Association (IWA)

Book Chapters

Coauthor of Water Environment Federation's (WEF) Manual of Practice – Conditioning Section (2010)

Coauthor of Environmental Protection Agency's (EPA) Process Design Manual for Sludge Treatment and Disposal – Sludge Transport and Conveyance Section (2012)

Dr. Dursun has provided detailed process design for water and wastewater treatment plants, onsite testing and optimization studies by using process models, particularly the BioWin® process modeling, including anaerobic digester modeling and mass balances. She has several publications on conditioning and dewatering of biosolids, which include peer, reviewed papers, and presentations at scientific conferences, a thesis, and a PhD dissertation. She is also coauthor of Water Environment Federation's (WEF) Manual of Practice Conditioning Section and Environmental Protection Agency's (EPA) Process Design Manual for Sludge Treatment and Disposal – Sludge Transport and Conveyance Section.

Biosolids & Energy Strategic Plan, Goleta Sanitary District, Goleta, CA
Task Lead for Biosolids Plan working in collaboration with energy group. Evaluated High Strength Waste availability and conducted capacity assessments for 10-mgd facility for current and future demands including high strength waste additions. The assessment included the investigation of existing mesophilic digesters and dewatering units. Also evaluating alternative technologies to enhance capacity and energy generation for the District, and developing a strategic plan to advance the energy generation in this facility.

Biosolids Loadout Condition Assessment, Eastern Municipal Water District, Perris, CA
Technical Lead. The biosolids loadout facility at the PVRWRRF has experienced failure of several components including loadout gates and loadout measurement cells. These failures have necessitated greatly increased operator involvement to keep the facility functioning. Hazen was appointed to evaluate current condition of the facility to recommend improvements that would restore it to reliable operation.

Engineering Consulting Services for Biosolids Treatment and Disposal, Town of Windsor, CA
Dr. Dursun is a technical lead for this project. The project includes assessment of current trends to achieve Class A Material without using anaerobic digestion and sludge drying beds. Drying technologies, including thermal drying and biodrying are shortlisted. The project will provide materials to support upcoming design phase.

Hazen

Refereed Journals

Dursun D., Ozkul S., Yuksel R., Unalan E. (2016) Enhancing capacitive deionization technology as an effective method for water treatment using commercially available graphene. Water Science and Technology 76(8),

Ebil M.T., Dursun D., Dentel S. K. (2014). Enhancement of Odor Removal and Dewaterability of Anaerobically Digested Sludge by Protease Addition. Journal of Residuals Science and Technology 11 (2), 55-64.

Dentel, S.K., Dursun, D. (2009). Shear Sensitivity of Digested Sludge: Comparison of Methods and Application in Conditioning and Dewatering. Water Research 43, 4617-4625.

Dursun D., Dentel S.K. (2009). Toward the Conceptual and Quantitative Understanding of Biosolids Conditioning: The Gel Approach. Water Science and Technology 59(9), 1679-1685.

Dursun D., Dentel S.K. (2007). The importance of structural and gel fractions in determining shear sensitivity of sludge. Water Science and Technology 56(9), 75-86.

Dursun, D., Turkmen, M., Abu-Orf M., Dentel S.K. (2006). Enhanced Sludge Conditioning by Enzyme Pretreatment: Comparison of Laboratory and Pilot Scale Dewatering Results. Water Science and Technology, 54(5), 33-41.

Dursun, D., Sengul, F. (2006). Waste Minimization Study in a Solvent Based Paint Manufacturing Study. Resources, Conservation and Recycling, 47(4), 316-331.

Dursun, D., Ayol, A., Dentel, S.K. (2004). Physical Characteristics of a Waste Activated Sludge. Water Science and Technology, 50 (9), 129-136.

Dr. Derya Dursun also has over 30 conference proceedings presented at international conferences.

Resource Recovery Facility Master Plan for Delta Diablo, CA

Dr. Dursun is leading biosolids management and energy recovery planning. The project conducted end use market study for the various biosolids product and high strength waste (HSW) market assessment to determine the available material for practicing co-digestion for increased biogas production. Reviewed the biosolids management regulatory landscape in CA. The project will investigate methods for increased digestion capacity and Class A producing options. Class A options will include evaluating thermal drying and eliminating reliance in land application practice through evaluating gasification and pyrolysis for producing biochar and other innovative technologies such as Super Critical Water Oxidation and Hydrothermal Liquifaction.

Plant 3A Solids Handling Facilities Improvements, Moulton Niguel Water District, Laguna Niguel, CA

Dr. Dursun is leading the Preliminary Design Task for Plant 3A Solids Handling Improvements Project. As an additional task, she has recently completed High Strength Waste (HSW) Evaluation Study that aims to assess HSW pretreatment options, capacity constraints and conceptual level layout and cost estimate. She has also been actively involved in process modelling, including supplemental sampling event. As part of Preliminary Design efforts, she is responsible to conduct capacity assessments along with process modelling, to evaluate alternative technologies to enhance capacity for Plant 3A and to develop a Preliminary Design Report (PDR) that would be used for the design of solids handling facilities at plant 3A.

Water Reclamation Facility 1110.2 Resultant Projects, City of San Bernardino Municipal Water Department, CA

Dr. Dursun is leading the Flare Replacement task working to enhance Digester Gas Management in the facility and meet ultra low emission (ULE) limits proposed in Rule 1118.1. She has evaluated current and future digester gas generation for 30 mgd facility and also impact of including high strength waste addition. Her tasks included identifying the design criteria for the ULE flares, evaluating the location for a new flare and also determining the upgrades in the existing digester gas system.

East Central Regional Water Reclamation Facility Biosolids Improvement Project, West Palm Beach, FL

Dr. Dursun provided technical support in the development of a start-up plan for mesophilic digesters. The 70 mgd facility includes TPAD process including co-digestion facility with FOG addition. The facility was designed and built by Hazen and currently in the development of methods to initiate the start up in new biosolids.

High Strength Waste Evaluations, City of Salem, OR

Investigated the impact of high strength waste (corn cuttings and silage squeeze) addition for co-digestion in anaerobic digesters. Analyses included the additional gas generation that may result from high strength waste addition, feeding regimes of the waste source.

Paul Vavonese, PE

Dewatering and Dryer

His experience includes treatment energy saving projects, industrial Municipal water and wastewater treatment facilities, wastewater treatment plants, wet weather CSO projects, and time spent as the engineer on site during construction of multiple projects. He has experience successfully balancing multiple projects simultaneously and working though all phases of large-scale Design/Build projects.

Education

BS, Civil Engineering, Rensselaer Polytechnic Institute

Certification/License

Professional Engineer

Areas of Expertise

- Wastewater treatment
- Biosolids and anaerobic digestion
- THP
- Aeration systems
- Primary treatment

Professional Activities

Water Environment Federation

VWEA

Technical Publications

Vavonese, P., *Class A Biosolids by Thermal Hydrolysis – Washington, DC's New Design/ Build Project* – DC Water, Washington, DC; 2014 NYWEA Spring Conference

Vavonese, P., *The Good, the Bad, and the Upgraded: A CSO Story,* Village of Canastota, NY, 2012 NYWEA Central Chapter Spring Conference

Vavonese, P., *Upgrade of the ParTroy WPCP*, Equivalent to Trading in a 1975 Buick for a 2012 Prius – Township of Parsippany-Troy Hills, NJ, 2013 NYWEA Annual Conference and 2012 NYWE Energy Specialty Conference

Leesburg Dryer Rehabilitation

Project Technical Advisor and Commissioning Assistance. Mr. Vavonese provided technical support for the the Town of Leesburgs' Dryer Rehabilitation and Improvements Project, which included an improved safety system, switching from burst disc fire suppression to charged fire extinguisher bottles with photo sensors for automatic deployment, improved dust collection, burner modulation improvements, exhaust fan replacement and control improvements, system control program revisions. The Town has an Andritz drum dryer system for their anaerobically treated and gravity thickened digested sludge. The dryer, operated by the town's staff, was originally installed in 2001, and has a burner capacity of 8.5 MM BTU and an evaporation rate of 4,400 lbs/hr. Mr. Vavonese was the on-site engineer representing the Town during the re-commissioning of the Dryer and performed inspection and troubleshooting alongside the Andritz technician and Town staff.

Potomac WFP Sedimentation Basin Upgrades and Backwash/FTW Treatment Project – WSSC Water

Project Manager. Consent decree driven ongoing design project at WSSC Water's Potomac Water Filtration Plant. Mechanical design responsibilities of this project, estimated at a construction cost of $66 million, include a pair of equalization basins to receive the sand filter backwash water as well as plant gravity thickener overflow. This component of the project includes a high-pressure air large bubble mixing system, a Computational Fluid Dynamic model for evaluation of the tank hydraulics and mixing, a drain/recirculation pump station, as well as various distribution piping and valves. This project also incorporates a 13 MGD pump station housing the project electrical room as well as a series of vertical turbine pumps transfer equalization basin water into plate settlers as well as a dry polymer batch and metering system to assist solids settling.

Hazen

Tunnel Dewatering Pump Station and Enhanced Clarification Facility, DC Water, Washington, DC
Lead Process Engineer and Resident Engineer (Prior Employment). Heavily involved in multiple aspects of the DC Water TDPS-ECF project design and construction. This $215 million design/build project was part of the larger Clean Rivers Project in Washington, DC. The TDPS-ECF consisted of a deep 250-mgd influent wet well and dry well pump station, with six 2000-HP medium voltage vertical end suction centrifugal pumps, physical modeling of pump suction, hydraulically actuated 36-inch and 18-inch cone valves for flow control, hydraulic power pack units, various hoists and bridge cranes, and a complete 250-mgd primary treatment facility to solely treat captured CSO. The CSO treatment portion of this facility included a Pistagrit Grit removal system and a three-train Actiflo® system rated for 83.6 MGD per train. These Actiflo® trains are the highest capacity Actiflo® trains in operation. Future expansion of this facility will have a 500 mgd capacity.

Herndon Pump Station Preliminary Design, Fairfax Water, VA
Project Manager. Led preliminary engineering design for a new 6 mgd (expandable to 10 mgd) booster pump station to serve the Town of Herndon's water system. Project efforts included pump station siting, incorporating NVRPA bridle trail and RPA considerations, pump selection and evaluation of building construction options (packaged or site built).

Piscataway Bio-Energy Project Design/Build – WSSC Water
Mr. Vavonese served as a design manager for this approximately $250 Million Progressive Design/Build project at WSSC Water's Piscataway treatment facility. Working closely with the Owner and the Joint Venture team, Mr. Vavonese was responsible for the design of the plant recycle water system improvements, in line UV disinfection of plant water to drinking water standards as needed to eliminate potential for pathogen transmission into neutralized Class A biosolid material, rehabilitation and retrofit of existing gravity thickeners, a new, low pressure bio-gas storage system, as well as various process mechanical items throughout work included in this project. The design processes falling under Mr. Vavonese's responsibility included Vertical Turbine, Rotary Lobe, Horizontal Centrifugal Chopper, and In-line Centrifugal pumps. Mr. Vavonese has provided continuing support through the construction of this project. Specific Role: Design Manager/Process Engineer

Solids Handling Upgrades for Pepper's Ferry Regional Wastewater Treatment Authority – Radford, VA
Hazen provided evaluation, design, and permitting, and will provide construction administration of the PFR-WTA Solids Handling Upgrades. The project includes upgrades to the primary sludge pumping, sludge blending, thickening upgrades, boiler replacement, digester heating approach modification, digester draining/transfer improvements, secondary digester mixing, liquid sludge holding tank mixing, cake conveyor replacement, related electrical/instrumentation improvements. and NFPA 820 driven improvements. The first two projects undertaken include replacing the digester heating boilers, NFPA 820-driven improvements, and rehabilitation of various solids handling facilities throughout the treatment process. *Status: Current contract is ongoing. Cost: $1.9 million (Total fees); $10.2 million (Construction Cost). Specific Role: Design Manager/Lead Process Engineer

Reclaimed Final Effluent Pump Systems Upgrade - Washington, DC
Design Engineer and Construction Administration. Served on design and construction phase support team for this project which includes the design, layout, and pre-selection of replacement vertical turbine pumps for both the high and low pressure recycled final effluent systems serving the Blue Plains Advanced WWTP. In addition, Mr. Vavonese provides senior review of the design and alignment of the discharge piping and appurtenances connected to the new vertical turbine pumps. Mr. Vavonese is responsible for the coordination of all demolition work related to the new work associated with the project as well as other outdated or abandoned equipment within the project area. Detailed and specific development of the equipment layout is critical for the construction sequence and minimizing the shutdowns required for construction as the high and low pressure recycled final effluent systems are critical for plant operation.

Brad Reisinger, PE

Dewatering and Dryer

Mr. Reisinger has extensive experience with mechanical systems, rotating equipment, and membrane related treatment systems. He has supported membrane applications such as municipal drinking water, waste water, and water reclamation and has direct experience with hollow fiber, nano/microfiltration, flat plate MBR, reverse osmosis, and electrodialysis reversal.

Education

BS, Mechanical Engineering, California Polytechnic State University, San Luis Obispo

Certification/License

Professional Engineer

Areas of Expertise

- Microfiltration/Ultrafiltration
- Reverse Osmosis
- Drinking Water
- Water Reclamation
- Concentrate Treatment
- Membrane Process Optimization
- Pilot operations

Professional Activities

American Membrane Technology Association

Southwest Membrane Operators Association

Water Reuse

San Bernardino Wastewater Treatment Facility Condition Assessment, City of San Bernardino, San Bernardino, CA

Project Engineer. Mr. Reisinger assessed and inventoried over 1,000 individual assets including: valves, instruments, pumps, motors, blowers, compressors, piping assemblies, centrifuges, and conveyors. (2019)

Stage 2 Membrane System Expansion Study, Olivenhain Municipal Water District, Encinitas, California

Engineer. The David C. McCollum Water Treatment Plant (DCMWTP) is a 34 MGD direct filtration facility that utilizes two stages of ultrafiltration (UF). The second stage is comprised of three submerged Zenon ZW 500D UF trains that are used to recover the stage one MF backwash after it has been processed through a solids handling system. The study evaluated the logistics of adding an additional stage 2 MF train identical to the existing three trains to increase capacity by 25%. The study evaluated impacts to the existing facility piping, UF backwash recovery system, and solids handling equipment. The study also evaluated the feasibility and equipment required to capture and recovery the backwash water from the facility automatically backwashing pre-strainers (2017)

South Bay Advanced Recycle Water Treatment Facility (SBARWTF) Project Construction Services, Santa Clara Valley Water District, Santa Clara, CA

Project Engineer. The Santa Clara SBARWTF is a reclamation facility that treats 8 mgd of secondary effluent with pressurized microfiltration as pretreatment to RO followed by ultraviolet disinfection. Mr. Reisinger reviewed all the reverse osmosis (RO) system mechanical submittals for specification compliance and assisted with start-up of the RO system. (2011-2014)

Hazen

Chaparral Water Treatment Plant (WTP) Modified Control System Coordination, City of Scottsdale, Scottsdale, AZ

Project Engineer, Mr. Reisinger performed a detailed coordination of modified control strategies for the membrane feed pump station, membrane rapid drain operation, wash water equalization basin, and chemical feed systems.

Chaparral Water Treatment Plant (WTP) Backpulse and Compressed Air Modifications, City of Scottsdale, Scottsdale, AZ

Project Engineer. Mr. Reisinger analyzed the microfiltration (MF) backwash system pressure surge condition, performed a hydraulic analysis and subsequent system redesign to eliminate surge. The redesign included the mechanical revised of the backpulse piping and pump station and a revised control strategy to correct water hammer in the system. Mr. Reisinger also audited the plant compressed air system demands versus capacity to rectify an insufficient supply issue. The supply issue was resolved by optimizing control set points which included revising the air removal vessels to allow for venture educator system to provide vacuum air removal to optimize the air consumption and eliminate the need for larger air compressors. The project was completed as a design build project.

Carson RWRF Expansion, West Basin Municipal Water District, Carson, CA

Project Engineer. Provided technical oversight for the design of a 5.88-mgd universal pressurized hollow fiber microfiltration system to operate as pretreatment for reverse osmosis for refinery boiler feed makeup water and a 2.5-mgd tertiary membrane bioreactor to provide cooling tower make up water. Both systems operate on Title 22 feed water. Both designs included membrane equipment procurement, equipment layout, site layout, and integration with existing systems.

CVWD Wellhead CR6 Treatment, Coachella Valley Water District, Palm Desert, CA

Project Engineer. Project included design of 23 individual Ion Exchange treatment systems utilizing Strong Base Anion (SBA) resin and one cen-tralized Ion Exchange treatment systems utilizing Weak Base Anion (WBA) resin. Was a Task Lead for all 32 SBA sites. Additionally conduct-ed hydraulic analysis of all SBA well sites, helped develop P&ID drawings for both the SBA and WBA sites, helped establish control strategies for both SBA and WBA sites, as well as site layouts for all treatment sites. Coordinated all process mechanical, civil, electrical, and architecture disciplines through the detailed design.

Feasibility Study to Develop the Simi Valley Basin as a Potable Water Resource, City of Simi Valley, CA

Project Engineer for a feasibility study to evaluate treatment options for groundwater in the Simi Valley Basin. Total dissolved solids dictated reverse osmosis as the preferred technology for the application. Iron and manganese dictated pretreatment with green sand media filters. Three different treatment site locations were evaluated for the treatment.

Thomas Groundwater Treatment Facility, City of Scottsdale, AZ

Mechanical Design Engineer for the design of a 1.5 mgd reverse osmosis system capable of treating water from multiple groundwater sources with varying water qualities. The design included the layout and design of one duty and one standby 1.5-mgd RO trains, membrane selection, antiscalant dosing, and acid dosing systems, and control design.

Bryan R. Lisk, PE, CEM

CHP/Energy Balance

Mr. Lisk is the firm's Energy Management lead with 20 years of water and wastewater energy management and design experience. Mr. Lisk has been involved in nearly all of Hazen's water and wastewater energy management projects.

Education

B.S. Electrical Engineer, North Carolina State University

Certification/License

Professional Engineer

Certified Energy Manager (CEM) – Association of Energy Engineers

Areas of Expertise

- Water and Wastewater Energy Management
- Water and Wastewater Electrical Engineering and Design

Professional Activities

Water Environment Federation

Association of Energy Engineers

Mr. Lisk's energy management experience includes biogas fueled combined heat and power (CHP) system evaluation and design, biogas to pipeline and vehicle fueling, biogas utilization modeling, interconnection and billing negotiations with natural gas and electric utilities, energy monitoring system, and energy management master planning. Mr. Lisk also has extensive experience with low- and medium-voltage power distribution systems, motor control systems, combined heat and power systems, standby power generation and peak shaving systems, lighting design, and variable frequency drive systems. Bryan is a Certified Energy Manager with the Association of Energy Engineers.

Biosolids and Energy Phase I: Preliminary Design, Goleta Sanitary District (GSD), Goleta, CA

CHP Lead. This project is developing a Preliminary Design Report that includes preliminary design of a new digester and CHP facility, develop cost estimate for these facilities, conduct regulatory and environmental assessment, and provide conceptual layout of all expected facilities for construction.

NapaSan Master Plan, Napa CA

Energy. The District selected Hazen to develop the Soscol Water Recycling Facility (SWRF) to provide NapaSan with strategic planning guidance and in-depth analysis of key focus areas. NapaSan intends to produce an actionable and strategic master plan that supports decision making over the next five-to-ten years while maintaining a 20-year planning horizon. the master Plan included key areas such as condition assessment, nutrients, biosolids, recycled water, capacity analysis.The Master Plan also includes an evaluation of vulnerabilities as well as susceptibility to climate change factors such as flood, wildfire risk and public safety power shutoffs.

Biogas Utilization Master Planning for the Eastern Municipal Water District (EMWD), CA

Mr. Lisk served as the project manager for a biogas utilization master plan for EMWD's four (4) water reclamation facilities. This project includes plant energy balance modeling to evaluate multiple long term biogas utilization strategies including CHP, RNG pipeline injection, fuel cells, and biogas fueled blowers. This projected included a detailed assessment of current and future air emission regulations and renewable energy market assessments.

Hazen

Technical Publications

Lisk, B. R., Dodson, J. J.,and Bullard, C. M., "Coordinating Utility Billing Rate to Maximize the Benefit from On-Site Energy Generation and Combined Heat and Power Systems", Proceedings of the 2011 Water Environment Federation (WEF) Energy and Water Conference, Chicago, IL, August 2011.

Rohrabacher, J. W., Lisk, B. R., Szoch, C., Bullard, C. M., Whitaker, J., Wichser, R., and Frederick, T. "Bigger Savings From Biogas", WE&T Magazine, April 2012.

Bullard, C. M., Lisk, B. R., and Hardy, S. A., "Micro-constituents in Digester Gas – Sweating the Small Stuff", Proceedings of the 2011 Water Environment Federation (WEF) Energy and Water Conference, Chicago, IL, August 2011.

Bullard, C. M., Lisk, B. R., and Hardy, S. A., "Achieving Economic and Environmental Sustainability Objectives through On-Site Energy Production from Digester Gas", Ohio Water Environment Association Annual Conference, Sandusky, OH, June 2011.

Bullard, C. M., Fishman, M. A., Lisk, B. R., and Hardy, S. A., "Putting Digester Gas to Work: Economic and Environmental Sustainability Via on-Site Energy Production", 2010 NC AWWA-WEA 90th Annual Conference, Winston-Salem, NC, November 2010.

Biogas Utilization Studies for the Goleta Sanitation District, Santa Barbara, CA

Lead Engineer. Provided preliminary biogas utilization studies for the Goleta Sanitation District (GSD) to identify feasible biogas utilization strategies that warranted further evaluations. This study included energy balance modeling to evaluate multiple long term biogas utilization strategies including CHP and RNG pipeline injection. Mr. Lisk is currently serving as the energy management technical lead on a detailed Energy and Biosolids Strategic Master Plan for the GSD.

West Napa Pump Station Project, Napa, CA

Project Manager in charge of increasing the firm capacity of the pump station to 15.4 mgd, and address the aging infrastructure such as the seismic condition of the 40-year old existing facility. The existing pump station was congested with little to no room for expansion of pumping capacity. Project elements include a new submersible pump station, new electrical building and infrastructure, chemical injection for corrosion control, odor control, solar panels, demo of the existing pump station and site civil improvements. The new electrical building had to be designed such that the finished floor was above the 100-yr flood plain elevations.

Moreno Valley RWRF TEPS MCC Replacement, Eastern Municipal Water District, Riverside County, CA

Sequencing and Operations Engineer for the TEPS MCC replacement project which includes the replacement of existing switchboards, motor control centers, variable frequency drives, and reduced voltage solid state starters that have deteriorated from exposure to chlorine gas. The new distribution and control equipment will be installed in a remote electrical building where it will not be exposed to the corrosive environment.

Energy Management Master Plan for the Town of Cary, Cary NC

Mr. Lisk was the project manager for the Town of Cary energy management master plan. This plan included long term and near term energy optimization recommendations for the Town's three (3) WWTP and one (1) WTP. This plan included energy modeling, process optimization, energy billing/procurement, and energy data management evaluations. Specific opportunities include energy monitoring expansions, aeration improvements, demand management, and DO control improvements.

Energy Management Master Plans for the North and South Durham Water Reclamation Facilities, City of Durham, NC

Mr. Lisk served as the Project Engineer for the North and South Durham energy management master plans. The master plans consisted of a series of projects to develop a long-term plan in coordination with the facilities' master plans to reduce energy usage and cost, and maximize the usage of renewable energy resources for each facility. Specific projects include biogas utilization, zone dissolved oxygen control, and influent pumping optimization.

Jack Yao, PE

Electrical

Mr. Yao has extensive electrical (power) engineering and discipline leadership experience. He has successfully led dozens of design, bid, build projects nationally and internationally in water/wastewater and oil/gas industries.

Education

BS, Electrical Engineering, University of California, Los Angeles

Certification/License

Professional Engineer

Areas of Expertise

- MV & LV power distribution system (up to 35kV)
- Power Distribution Center (PDC) design

He is experienced in MV & LV power distribution system design, hazardous area classification, motor & generator applications, aboveground and underground installation design, grounding system, lighting design, and power system automation.

Design Services for Digester Room MCC-2 Upgrades, Las Gallinas Valley Sanitary District, San Rafael, CA

Mr. Yao served as Lead Electrical Engineer responsible for performing an NFPA 820 assessment to evaluate the existing electrical installation in the digester area and designing a new 480V MCC to replace an aging existing MCC feeding digester loads.

1,2,3-TCP Removal Treatment Plant, City of Chino Hills, CA

Mr. Yao served as Lead Electrical Engineer responsible for designing a new 480V electrical distribution system to feed the existing water booster pumps and a new water treatment plant. The new distribution system includes a new service entrance switchboard, a new 480V MCC lineup, and new 480V VFD's.

12kV Service Entrance Power Center Upgrade, Union Sanitary District, Union City, CA

Mr. Yao served as Lead Electrical Engineer responsible for designing a new 12kV pre-fabricated service entrance power center to replace an existing service entrance switchgear to expand the existing electrical capacity at the waste water treatment plant. The new power center includes a new 12kV secondary selective switchgear lineup, a new 480V switchboard, and other auxiliary equipment.

Enhanced Treatment & Site Upgrade (ETSU) Program - Phase 1B, Union Sanitary district, Union City, CA

Mr. Yao served as Lead Electrical Engineer responsible for designing a new 480V electrical distribution facility to provide power to new RAS/WAS Pump Station, Effluent Facility, and Reclaimed Water Pump Station. The new distribution facility includes new 480V switchboards, 480V MCC lineups, and other auxiliary equipment.

Hazen

State Street Water Treatment Plant, City of Chino, CA
Mr. Yao served as Lead Electrical Engineer responsible for designing new 480V electrical distribution systems to feed the existing pump stations and a new standalone water treatment plant. The new distribution systems includes new service entrance switchboards, new 480V MCC lineusp, and new 480V VFD's.

Biosolids & Energy Phase 1, Goleta Sanitary District, Goleta, CA
Mr. Yao served as Lead Electrical Engineer responsible for designing new Combined Heat & Power (CHP) unit to utilize digester gas to generate power to supplement plant power consumption, and a new 480V electrical distribution systems to feed new digester loads.

Substation 33/34 Switchrack Replacement Project, Chevron El Segundo Refinery, El Segundo, CA
Mr. Yao served as Lead Electrical Engineer responsible for designing six new 480V switchracks to replace existing 50-year-old units. The project involved replacing existing main incoming cables to each switchrack, design new switchrack components (bus boxes, breakers, motor starters, and distribution panelboards), and refeed all existing loads.

F-720/731 SCR Retrofit Project, Chevron El Segundo Refinery, El Segundo, CA
Mr. Yao served as Lead Electrical Engineer responsible for designing a new Power Distribution Center (PDC) to support new plant loads added to retrofit a new SCR system to the existing furnaces. The project involves adding new 15kV breakers sections at the refinery main substation and routing new 15kV feeders via pre-fabricated duct banks to new 15kV Load Interrupting Switches closed-coupled with 13.8-2.4kV and 13.8-0.48kV oil-filled transformers to provide power to the new PDC.

Refinery Wireless Project, Chevron El Segundo Refinery, El Segundo, CA
Mr. Yao served as Lead Electrical Engineer responsible for designing refinery-wide wireless system to allow plant operators to use mobile devices to communicate back to the main control room. The project involves collaborating with wireless equipment vendor, design wireless access points, and provide 120V UPS power to each access point enclosure.

Pro+ Bundled Projects – Cooling Tower 14, Chevron El Segundo Refinery, El Segundo, CA
Mr. Yao served as Lead Electrical Engineer responsible for designing a new electrical distribution system to feed a new cooling tower in the refinery. The project involves designing a new Power Distribution Center (PDC) to feed MV and LV cooling tower loads via cable tray system.

Nanushuk Development Project, Armstrong Energy, North Slope Borough, AK
Mr. Yao served as Lead Electrical Engineer responsible for the conceptual design of power generation and distribution system consist of four 13.8kV gas-turbine generators, 13.8kV switchgears, 4.16kV and 480V switchgear and MCC lineups feeding a dozen enclosed sea-lift and truckable type modules in the central processing facility and three remote drill sites.

Compressor #3 Addition Project, Hess Corporation, City of Tioga, ND
Mr. Yao served as Lead Electrical Engineer responsible for upgrading the existing power distribution system to feed a new gas-driven compressor package. The project involves adding a new 480V switchrack fed from the existing 2.4kV overhead pole line, and a new electric heat trace system.

Arty Lau, EIT

Electrical

Mr. Lau is a recent addition to Hazen and a part of the electrical engineering team. He has assisted on numerous projects for large utilities throughout the West.

Education

BS, Electrical Engineering, California Polytechnic State University

Certification/License

Engineer-in-Training

Areas of Expertise

- Electrical design
- Power systems
- SolidWorks
- MATLAB

J.B. Latham Treatment Plant, South Orange County Wastewater Authority, Dana Point, CA

Assistant Electrical Engineer for an improvements project that included preliminary design for the replacement of the Plant 1 Standby Generator, replacement of the effluent flow meters, and replacement of the plant effluent valves. The project also included detailed design of the rehabilitation of the Plant 1 Grit Basins. Performed multiple site visits to assess handhole and MCCs on site. Created load lists, site plans, and single line drawings based on record drawings and on-site information.

Moreno Valley Regional Water Reclamation Facility Solids Handling MCC Replacement, East Municipal Water District, Riverside County, CA

Assistant Electrical for the replacement of four motor control centers at the Moreno Valley Regional Water Reclamation Facility (RWRF) that have exceeded their rated useful life. The project included a condition assessment of the existing motor control centers which required a shutdown of the plant equipment during non-peak hours and also a detailed maintenance of plant operations plan to minimize plant distributions during construction. Responsible for creating and revising drawings for the project.

Blower Electrification Project, Eastern Municipal Water District, Riverside County, CA

Assistant Electrical Engineer for the replacement of five gas driven blowers with high speed turbo blowers at three different RWRFs: Moreno Valley, San Jacinto Valley, and Temecula Valley. The electrical improvements at the Temecula Valley RWRF include modifications to the existing 12kV distribution system, installation of a new 480V distribution system and a new standby generator integrated into the facilities existing closed transition generator control system. The electrical improvements at the San Jacinto Valley RWRF include the integration of a new 12kV generator into an existing paralleling switchgear assembly. Evaluated submittals from contractors, revised construction drawings, and verified generators on site with through contractors.

Hazen

Adele Pump Station Arc Flash Study for the Los Angeles Department of Water and Power, Los Angeles, CA
Assistant Electrical for the Adele Pump Station Arc Flash project. Performed load flow, short-circuit, protective device coordination, and arc flash analyses using ETAP electrical modeling software. Additionally, updated record single line drawings based on field conditions.

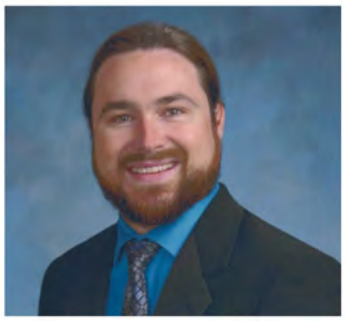
- Performed a site visit to assess pump station and conditions of their electrical equipment.
- Create a technical memorandum outlining the condition assessment and current electrical power studies assessing the pump station electrical safety.

La Brea Transmission Main and Coffee Bean Tea Leaf Production Well Design and Support Services, City of Beverly Hills, CA
Assistant Electrical Engineer for new construction of well site in Beverly Hills, CA. Performed lighting calculations through ElumTools on Revit and coordinated with Holophane representative for lighting calculations. Established preliminary load list, created and edited drawings, and coordinated with the Los Angeles Department of Water and Power representative to establish new service to well site.

Well #26 and Bullard Water Campus RO Facility Improvements, City of Goodyear, AZ
Project entails expansion of water supply through the addition of new groundwater supply.

- Assisted in submittal reviews from contractors
- Edited drawings on both AutoCAD and Revit.
- Created load lists, site plans, and single line drawings based on record drawings and on-site information.

Facility Master Plan and 1110.2 Resultant Project, San Bernardino Municipal Water Department, CA
Assistant Electrical Engineer for the Facility Master Plan and 1110.2 Resultant Project for the San Bernardino Water Reclamation Plant. The Master Plan included a plant wide condition assessment including all electrical distribution and motor control equipment. The 1110.2 Resultant Project included the replacement of two digester gas driven blowers with five high speed turbo blowers, installation of new low emission and ultra low emission flares, and the installation of a 175,000-SCF dual membrane digester gas storage tank. The electrical improvements included modifications to the existing 12kV distribution system, installation of a new 480V distribution system, and installation of a new 2000kW standby generator. Created and edited drawings with a group of four other engineers and established conduit routing designs for various equipment to electrical room.



Alan Mlakar, PE

I&C

Mr. Mlakar has over 8 years in the Water/ Wastewater industry. He specializes in electrical and instrumentation design, electrical system studies, and engineering services during construction. This encompasses knowledge of electrical distribution systems, motor control centers, programmable logic control (PLC), process control related to water, wastewater and power projects.

Education

B.S., Electrical Engineering, California Polytechnic State University, California

Certification/License

Professional Engineer

Areas of Expertise

- Electrical System Studies
- Electrical/Instrumentation and Control Systems
- Water and Waste Water Facility design
- Engineering services during construction

Professional Activities

IEEE

Biosolids and Energy Phase I: Preliminary Design, Goleta Sanitary District (GSD), Goleta, CA

Electrical and I&C Lead. This project is developing a Preliminary Design Report that includes preliminary design of a new digester and CHP facility, develop cost estimate for these facilities, conduct regulatory and environmental assessment, and provide conceptual layout of all expected facilities for construction.

Moreno Valley RWRF Solids Handling MCC Replacement East Municipal Water District, Riverside County, CA

Lead Electrical for the Solids Handling MCC Replacement Project which includes the replacement for four motor control centers that have exceeded their rated useful life. The project also included a condition assessment of the existing motor control centers which required a shutdown of the plant equipment during non-peak hours and also a detailed maintenance of plant operations plan to minimize plant distributions during construction.

Delta Plant Improvements for PFAS Treatment, City of Monterey Park, CA

Lead Electrical and Instrumentation Engineer. Hazen, in partnership with Filanc Construction, is designing and constructing a GAC treatment system for PFAS in the groundwater for a flow of 7,500 gpm. The pretreatment system consist of cartridge filters and chlorine is added to the treated water for disinfection. The groundwater is impacted by 1,4-dioxane and an UV-AOP system was implemented by the team in a previous phase of the project.

Hazen

Water Treatment Plants for Stations 7 and 11, Lemoore, CA
Lead Instrumentation and Control for the City of Lemoore Stations 7 and 11 Water Treatment Plants. Hazen, in partnership with Filanc Construction, was selected by the City of Lemoore to provide progressive design build services for two groundwater treatment plants. The groundwater has been impacted by iron, manganese, ammonia, sulfides, color, turbidity, arsenic and high TOC concentrations forming elevated DBPs in the presence of chlorination. Sixty percent design was completed in sixty days in order to assist Filanc with preparing the guaranteed maximum price (GMP). Final design proceeded in August 2019 with construction scheduled to commence at the end of 2020. Hazen is providing engineering design and services during construction and startup.

Whittier PFAS Treatment Support, Suburban Water System, Covina, CA
Electrical and I&C Lead. Suburban Water System's Whittier and La Mirada Systems required engineering design services to remove PFAS compounds from 5 drinking water wells, comprising 10,600 gpm. Hazen is leading the preliminary design and treatment approach evaluation, sharing process mechanical design with the prime consultant, and leading electrical and I&C. Hazen is also providing support on the design of RSSCT bench-scale testing, and is leading the facility permitting.

Chino I Desalter VOC Treatment, Chino Basin Desalter Authority, CA
The project includes preliminary and final design of two (2) GAC treatment facilities (1.7 mgd and 3.4 mgd) at the Chino I Desalter Plant for the removal of TCE and 1,2,3-TCP, and evaluation of treatment requirements for 1,4-dioxanr, cis-1,2-DCE, 1,2-CDA, PFOA, and PFOS. The goal of this project is to provide groundwater treatment for all CDA bypass wells (CDA Wells I-1 through I-4), and several treated wells (CDA I-16 through 18), plus 10 new wells that will be installed by the County of San Bernardino as part of a Cleanup and Abatement Order issued by the Santa Ana Regional Water Quality Control Board (SARWQCB).

Santa Clara and Honby Wells PFAS Groundwater Treatment Improvements, Santa Clarita Valley Water Agency, Santa Clarita, CA
Electrical and I&C Support for the preliminary and final design of the Ion Exchange (IX) treatment system (3.5 MGD) for removal of PFOS/PFOA from Santa Clara and Honby Wells. The project includes preparation of final design documents, 3D model of the treatment system, hydraulic analysis of well pumps, cost estimates, permitting, bid assistance, and engineering services during construction.

E-Wells PFAS Groundwater Treatment Improvements, Santa Clarita Valley Water Agency, Santa Clarita, CA
Electrical and I&C Support for the preliminary of the Ion Exchange (IX) treatment system (7.0 MGD) for removal of PFOS/PFOA from E-Wells (E-14, E-15, E-16, and E-17). The project includes preparation of preliminary design of the treatment system, site layouts, 3D model of the treatment system, hydraulic analysis of well pumps, and cost estimates.

Well #26 and Raw Water Transmission Main Design, City of Goodyear, Goodyear, AZ
Lead Electrical and Instrumentation Engineer for the City of Goodyear Well #26 and Raw Water Transmission and Main design project. This $1.9M project is a design-build project for the installation and equipping of Well #26, raw water transmission main, and design modifications to the 3 MGD Bullard Water Campus to treat an additional 1.5 MGD of flow.

Anna Munson, PE

Process Mechanical

Ms. Munson is a civil engineer specializing in water and wastewater systems. She leads technology assessments, development of alternatives for system improvements, wastewater and drinking water system design, plans and specification development, and preparation and delivery of client presentations. She has in-depth experience in wastewater solids and digester gas systems, including solids and energy balances, projections of residuals and gas production and combined heat and power systems.

Education

MS Civil & Environmental Engineering, University of Washington

BS, Civil & Environmental Engineering, University of Wisconsin, Madison

Certification/License

Professional Engineer

Areas of Expertise

- Wastewater treatment
- Wastewater and water residuals
- Drinking water treatment
- Water supply studies

Professional Activities

Water Environment Federation

American Water Works Association

Wastewater Treatment Plant Improvements Facility Plan and Design, City of Delano, MN

Senior Wastewater Engineer. Investigated the alternatives for modification of the Delano WWTP to increase liquid chemical storage and to install new sludge dewatering equipment in place of an existing gravity belt thickener. Seven configurations were evaluated for impact to building structure and existing systems. The selected configuration was carried forward for detailed design, currently in progress.

Facility Plan, Rock River Water Reclamation District, Rockford, IL

Process Engineer. Developed and evaluated alternatives for enhanced anaerobic digestion, side stream nutrient harvesting and biosolids drying at the Rock River Water Reclamation District (RRWRD) wastewater treatment plant. Evaluated alternatives to optimize energy recovery from the biogas produced by the anaerobic digestion process. Prepared a plan to implement recommended improvements in phases and accommodate a high level of uncertainty in the future effluent standards.

Solids Handling Facilities Improvements Project, Central Contra Costa Sanitary District, Walnut Creek, CA

Process Engineer. Prepared descriptions and schematics of the recommended improvements to the dewatering system at the Central San WWTP. Developed equipment selection specifications for the new dewatering centrifuges and reciprocating piston pumps in support of the design phase. Performed detailed mechanical design of the solids handling improvements.

Hazen

Integrated Waste to Energy Biosolids Master Plan, City of Oceanside, CA
Process Engineer. Evaluated alternatives for using digester gas at the Oceanside Water Resource Recovery Facility. The evaluation was based on future digester gas production with a series of increases due to addition of food waste from local and regional feed stocks into the anaerobic digesters. A screening analysis was used to narrow the technologies for further evaluation to cogeneration of heat and power using internal combustion engines and production of renewable natural gas. Performed detailed financial analysis and non-financial analysis of each alternative. The results of the analysis formed the foundation for development of the Master Plan.

Cogeneration Rehabilitation and Management, Municipal Water Reclamation District, Denver, CO
Process Engineer. Developed seven alternatives to rehabilitate and improve the existing combined heat and power (CHP) system at the R.W. Hite Water Treatment Facility. Presented preliminary system sizing, equipment, costs and benefits. Performed detailed analysis on the preferred alternatives to refine equipment sizing, supporting equipment needs, emissions controls, preliminary equipment layouts and lifecycle cost analysis.

Northside Biosolids Master Plan, City of Tulsa, OK
Process Engineer. Developed projections for biosolids production at the Northside WWTP within the next 20 years. Assessed ability of existing equipment and processes to treat the projected wastewater loading. Developed alternatives capable of meeting the loading requirements and estimated the cost of each alternative. Provided recommendations for improvements to help the facility meet their biosolids management needs.

WERF ENER 13T14: Energy Recovery from Thermal Oxidation of Wastewater Solids, Water Environment & Reuse Foundation
Process Engineer. Researched the costs associated with energy recovery from thermal oxidation of wastewater solids and the costs of electricity generated from coal. Incorporated the costs into a triple bottom line analysis to compare the economic, environmental and social implications of the two alternatives. Summarized the results of analysis into a chapter for the study report. Presented the conclusions of the report at the 2017 WEF Residuals and Biosolids Conference.

Seneca Wastewater Treatment Plant Solids Improvements, Metropolitan Council Environmental Services, Eagan, MN
Project Engineer. Designed improvements to the multiple hearth incinerators, exhaust gas scrubber and air pollution prevention system and replacement of thickening centrifuges with gravity belt thickeners at Seneca WWTP. Improvements were developed as a result of emissions testing, condition assessments and cost analysis we completed at the beginning of the project.

Wellhouse 1 Improvements Construction, City of Dayton, MN
Senior Project Engineer. Performed construction management services in support of the Wellhouse 1 Improvements construction. Led construction update meetings, supervised and coordinated review of all construction submittals, RFIs and change orders. Worked closely with Wenck's on-site construction supervisor to ensure quality construction.

Cedar Rapids Lime Softening Residuals Study, City of Cedar Rapids, IA
Process Engineer. Researched the breadth of reuse opportunities for the residuals from two lime softening water treatment plants, including the regulations governing each reuse opportunity. Developed residuals management alternatives based on the reuse options, including preliminary sizing of required equipment and product storage. Presented and refined the management alternatives through Client workshops. Summarized the management alternatives and the decision-making process into a report for use in capital improvements planning.

Swaid Alhajri, PE

HVAC

Mr. Alhajri is a 20-year Mechanical Engineer with strong background in wastewater and water industry. He is uniquely knowledgeable in both heavy process mechanical and HVAC evaluation and design, construction documents preparation, and construction coordination. He is experienced in process integration and constructability review for pump stations and treatment facilities.

Education

MBA, University of San Francisco

B.S., Mechanical Engineering, University of Missouri, Columbia, MO

Certification/License

Professional Engineer:

Professional Activities

Beta Gamma Sigma International Honor Society

American Society of Mechanical Engineers

Toastmaster International

Enhanced Treatment and Site Upgrade, Union Sanitary District, CA
Mechanical lead to provide planning and design services for the Enhanced Treatment and Site Upgrade (ETSU) Program. USD provides wastewater collection, treatment, and disposal services to the cities of Fremont, Newark, and Union City in Alameda County, California. All flows from these cities are transported and treated at USD's 33-mgd Alvarado Wastewater Treatment Plant (AWWTP). As a building mechanical lead, responsibilities included HVAC, plumbing, and odor control planning and design services to support plant expansion.

Solids Handling Improvements at Plant 3A, Moulton Niguel Water District, Aliso Viejo, CA
Lead HVAC for this project which will provide a comprehensive upgrade of the solids handling facilities at a 6 mgd wastewater facility. The scope includes digester rehabilitation and equipment replacement for solids thickening, dewatering, gas handling and digester heating as well as associated electrical and controls improvements.

Laguna Treatment Plant Disinfection Improvements, City of Santa Rosa, Santa Rosa, CA
Design manager of the of the Laguna Treatment Plant tertiary system upgrades. The project provides upgrades to rerate the plant to 67MGD after being derated by the regional board to 48.5MGD. Improvements include replacement of existing UV system by a new low-pressure, high-output system. The project will also add diversion system to return off-spec effluent to the flow equalization basins at the head of the plant for further treatment. The diversion system included over 0.5M gallon tank, pump station, and 2,500ft 48-inch pipeline.

Hazen

Blower Electrification Project, Eastern Municipal Water District, CA
Lead HVAC Engineer for the Blower Electrification Project which includes the replacement of gas driven blowers with high speed turbo blowers at three different water reclamation facilities: Moreno Valley RWRF, San Jacinto Valley RWRF, and Temecula Valley RWRF. The HVAC improvements include design of new supply and exhaust ventilation systems that are interlocked with blower operations to provide process air as well as maintain climate control within each space.

City of Santa Rosa Wastewater Treatment Plant, Disinfection Improvements, Santa Rosa, CA
Mr. Alhajri led the evaluation and design of the 67-mgd UV effluent diversion system directing flow to the flow equalization basins at the treatment plant. He was the project engineer coordinating the design team for the sizing and selection of the pre-purchased equipment.

Vasona Pump Station Upgrade Planning Services, Santa Clara Valley Water District, Santa Clara, CA
Project Manager for the improvements that will upgrade and modernize the Vasona Pump Station Plant. The improvements will provide a reliable, efficient and easy to operate facility, and involved the necessary repairs and replacement to the aging infrastructure to meet existing and future demand.

Coastal Treatment Plant Facility Improvements, South Orange County Wastewater Authority, Dana Point, CA
Lead HVAC Engineer for the facility improvements project, which includes replacement of the ferric chloride chemical storage and feed system, replacement of the secondary clarifier equipment (sludge and scum collection), new Drainage Pump Station, repair of damage to concrete structures throughout the plant and installation of fall protection (safety) features. HVAC scope included the condition assessment and design of air-conditioning and ventilation systems to maintain temperature control at process buildings, electrical rooms, and storage facilities.

City of Hollister Lessalt WTP Disinfection Byproducts (DBP) Reduction Improvement Project, Sunnyslope County Water District, Hollister, CA
The Lessalt WTP treats surface water from the San Luis Reservoir via the Hollister Conduit, serving the City of Hollister and Sunnyslope County Water District. The project included e design of a steel treated water tank and two pump stations to address the hydraulic limitation of the plant. Responsibilities included hydraulic analysis and design of two pump stations (2.25 mgd and 0.75 mgd) to deliver water to the high and middle pressure zones.

Garfield Reservoir and Pump Station Replacement Project, South Pasadena, CA
The project included the demolition of the existing reservoir and pump station, construction of two new partially-buried cast-in-place concrete reservoirs (total 6.5 million gallons), new pump station, and 2-story admin building. Responsibilities included hydraulic analysis and design of 6 mgd pump station, as well as design of HVAC, plumbing, and fire protection systems for the admin building.

Estrella Mountain Ranch Southern Solutions Water Supply Project (Phase I), Newland Communities, Goodyear, AZ
Lead Mechanical Engineer: Served as building mechanical lead for master planning of a new RO treatment plant. As the building mechanical lead for the Phase 2, will lead the design of the HVAC, plumbing, and fire protection effort for the RO WTP facilities.

William H. Russell, AIA, LEED AP

Architecture

Mr. Russell has extensive experience in the architectural design of water and wastewater treatment plants, maintenance buildings, laboratories, and other industrial facilities. Bill also has extensive experience in coating systems and their application at wastewater facilities.

Education

BA Design, Clemson University

Certification/License

Registered Architect: CA, #C34743, Issued: 07/14/2014; Expires: 01/31/2021

Additional State Registrations: NY, NC, VA, IL, MD, CT, OH, NH, TX , MA

Experience

Total: 35 years

With Hazen: 25 years

Home Office Location

Raleigh, NC

Professional Activities

American Institute of Architects

The Society for Protective Coatings

International Code Congress

National Fire Protection Association

Technical Publications

Lab Remodeling: Considerations and Pitfalls; Lab Technology Day 2012

Chasing LEED certification for a New Water Treatment Plant; NC AWWA/WEA 2010

Building Code Impacts at Wastewater Treatment Facilities; VWEA 2003

Los Angeles Department of Water and Power, Treatment for San Fernando Groundwater Basin, Los Angeles, CA

Architecture Lead. The project is a large-scale groundwater remediation which may require advanced treatment. Role includes leading civil design for multiple water treatment plants. Civil design included trunk line piping, yard piping, off-site piping, grading, paving, drainage, and miscellaneous site improvements. Coordination with other disciplines including mechanical, electrical, instrumentation, architectural, and structural.

Plant 30 Wellhead Treatment Design, Montclair, CA

Architecture Lead for the planning and design of a 4,000 gpm treatment system for Monte Vista Water District. Treatment includes GAC for 1,2,3-TCP and regenerable ion exchange for nitrate and perchlorate. The design includes treatment of two out of three wells and pipelines from two wells to the third well site. Future expansion for treating all 3 wells is a design consideration.

Eastside Water Treatment Facility Expansion Project, Chino, CA

Architecture Lead. Design of a 3,500 gpm treatment expansion for the City of Chino at the Eastside Facility. Treatment includes GAC for 1,2,3-TCP and ion exchange for nitrate. The design includes treatment of three wells, with potential for a fourth, pipelines, buildings and control systems. This design requires careful integration of the new equipment with existing treatment on site.

West Basin Municipal Water District, CRWRF Phase II Expansion, Carson, CA

As Project Architect Mr. Russell, provided architectural design for the building associated the 2.0 MGD tertiary membrane bioreactor system which included a single-story masonry building housing blowers and electrical equipment. The 5.0 MGD universal MF System was covered using a pre-engineered metal building canopy system to a clear span structure.

Hazen

City of Signal Hill – Wellhead No. 9 NF Treatment System, Signal Hill, CA
The project utilizes a Design Build delivery system. Mr. Russell is Project Architect for the design of facility. The facility included a pre-engineered metal building housing an operations/training room, toilet room, and electrical equipment. Treatment vessels were covered using pre-engineered metal building canopies with an eight-foot-high vertical fascia/wall system.

Chromium 6, Coachella Valley Water District, Coachella Valley, CA
Mr. Russell provided architectural design for several structures related to the Chromium 6 project. The project required structures to be designed to be compatible with surrounding land uses and aesthetics. Several renderings were produced to convey aesthetic and view considerations. The project included a central regeneration facility that included a 40,000 square foot central regeneration facility. The central regeneration facility includes an administrative space, laboratory space, control rooms, locker rooms, process, dewatering, and chemical area. The projects include several well sites that included treatment canopies and electrical rooms. Each of the well sites were designed to blend with the neighborhood. Many included terra cotta roof structures and stucco wall panels. The well head structures included removable roofs to provide access to the well heads.

Cr6 Treatment Design for Wells 13A, AA, and 1E, Indio Water Authority, Indio, CA
Mr. Russell provided architectural design assistance for the Well Sites and associated canopies above each well.

Chromium 6 Treatment Plant, Santa Ynez River Water Conservation District No. 1, Santa Ynez, CA
Mr. Russell provided preliminary architectural design for a 4,800 square foot treatment facility which included process space, locker rooms, multi-purpose room, process laboratory, electrical and control room. The building was designed with a porch and stepped back from the main street to reduce the perceived height of the building along the road and reflect the scale of the building from the street.

Jonathan Rogers Water Treatment Plant Ozone Facilities Upgrades Services, El Paso Water Utilities, El Paso, TX
Architect for upgrades to the ozone system at the 60 MGD surface water treatment plant. Includes the design and construction phase services for a new liquid oxygen-based ozone generation system including modifications within spaces and removal and reroofing of the Ozone Treatment Facilities.

Winson Water Treatment Plant, North Miami, Florida
Mr. Russell provided design services and was building sustainability coordinator. The project included process modifications and included a new administration building with control room, laboratory, office, emergency operations center, and other common facilities and the project also included modification to existing buildings. The new administration building was designed to incorporate sustainable strategies.

Arcadia Water Treatment Plant, Arcadia, Florida
Provided preliminary design and final QA/QC services. The project included a new high service pump station building which also housed a control room, operator's laboratory, office, toilet facilities, and mechanical spaces. The building utilized masonry walls with a stucco finish.

Hidden Lake Water Treatment Plant, Indiana American Water, Warsaw, Indiana
Mr. Russell provided architectural design assistance and was LEED Project Administrator for the new Water Treatment Plant. The design build project included a new 12,000 square foot filter building and a 5,000-square foot distribution and maintenance facility. The administrative area included office, control room, and laboratory space. The filter building housed the filters, administrative areas, high service pumps, and chemical storage.

Gregg Cummings, PE

Civil

Mr. Cummings has over 34 years of experience in the planning, design, and construction support of water, wastewater, and recycled water projects, utility upgrades, groundwater treatment systems and soil remediation systems. An accomplished project manager, he provides technical and management capabilities to work in collaborative settings involving complex projects and community interests. He has managed a wide variety of projects from initial planning, through design, construction and operation.

Education

M.S., Environmental/Structural Engineering, San Jose State University

B.S., Civil Engineering, University of California, Berkeley

Certification/License

Professional Engineer

Areas of Expertise

- Water treatment, storage, and distribution
- Wastewater collection, treatment, and disposal
- Recycled water treatment, storage, and distribution
- Stormwater planning and design
- Utility assessment and planning

Professional Activities

American Society of Civil Engineers

American Water Works Association

Chi Epsilon

Project Management Institute

Toastmasters

Water Environment Federation

West Napa Pump Station, City of Napa, CA
Provided senior technical quality control review for the design to increase the firm capacity of the wastewater pump station to 15.4 mgd and address the aging infrastructure such as the seismic condition of the 40-year old existing facility. Project elements include a new submersible pump station, new electrical building and infrastructure, chemical injection for corrosion control, odor control, solar panels, demo of the existing pump station and site civil improvements.

Skyfarm 'A' and Hansford Court Lift Station Reconstruction, City of Santa Rosa, CA
Provided senior technical quality control review for the design for reconstruction of two of the City of Santa Rosa's wastewater lift stations destroyed in the 2017 Tubbs fire. The reconstruction included replacement of existing lift station structures, pumps, electrical service, and associated electrical, mechanical and control components along with provisions for temporary pumping and power to provide uninterrupted wastewater service to the surrounding residents. Since these lift stations were destroyed as part of a natural disaster, the design also required collaboration and coordination with the City and FEMA to comply with federal funding requirements.

San Bernardino Lift Station Emergency Diversion System, Inland Empire Utility Agency, Chino, CA
Project Manager. Managed the force main and pump station analysis, including flow monitoring, for the San Bernardino Lift Station and Force Main.

Hazen

Alvarado Effluent Pump Station Modifications, East Bay Dischargers Authority, Union City, CA
Project Manager. Evaluated the 43 mgd Alvarado Effluent Pump Station to determine modifications to eliminate deficiencies, including vibration, low-flow instability/noise, suspected cavitation, possible air entrainment, and excessive wear/reduced equipment life (including electric corrosion in the motors).

VFD Replacement Plan for Three Pumping Stations, Monterey Regional Water Pollution Control Agency, Monterey, CA
Project Engineer. Performed a hydraulic study for the variable speed drive (VFD) replacement plan to facilitate the systematic replacement of 16 direct current drives and motors at Seaside, Fort Ord, and Salinas pumping stations.

Tennyson Road Pipeline and Lift Station, City of Hayward, Hayward, CA
Project Engineer. Provided senior review for design of replacement of several pipelines, interconnection structure of two parallel sewer lines near a freeway, and modifications to the Tennyson Road lift station to increase pump capacity from 3.9 mgd to 5.1 mgd.

Wastewater Pump Station Modifications, City of South San Francisco, South San Francisco, CA
Project Engineer. Managed design modifications for two wastewater pump stations, including replacing sluice gates and installing flexible pipe couplings. Prepared plans, specifications, and cost estimates, and provided construction support.

WAS Pumping Station, Oro Loma Sanitary District, San Lorenzo, CA
Project Engineer. Designed a new WAS pumping station for the wastewater treatment plant.

Pump Station and Force Main Evaluation, City of Stockton, Stockton, CA
Project Team Member. Analyzed current and future wastewater pumping and piping capacity for all pumping stations feeding into the wastewater treatment plant.

Wastewater Collection Study, City of Belvedere, Belvedere, CA
Project Engineer. Performed a wastewater collection feasibility study and prepared preliminary plans and cost estimates for a wastewater pipeline and associated pump stations.

Miscellaneous Mechanical Improvements, Union Sanitary District, Union City, CA
Project Manager. Managed the design of miscellaneous improvements to the wastewater treatment plant, including pump replacements, cathodic protection improvements, overflow pipelines, and other mechanical/electrical upgrades.

Contract 24 – Filtration/Chlorine Contact Design, City of Las Vegas, Las Vegas, NV
Project Manager. Managed the design of effluent filter modifications and a new chlorine contact basin for water pollution control facility as part of the plant expansion to 91 mgd. Project included expanding two pump stations, converting contact clarifiers to filters, modifying filter gallery piping, installing new chemical induction units, constructing a new chlorine contact basin, and associated piping and appurtenances. Also prepared an emergency flow (power outage) plant operation plan.

Wastewater Treatment Plant Tertiary Improvements, City of Mount Shasta, Mount Shasta, CA.
Project Engineer. Designed tertiary treatment for a wastewater treatment plant, including dissolved air flotation, rapid sand filtration, a pump station, a chemical feed system, piping, and appurtenances.

Serena Takada, EIT

Civil

Ms. Takada specializes in stormwater management and storm resiliency. Her expertise includes the siting and design of stormwater BMPs and green infrastructure; design of storm resiliency systems; research and development of water and wastewater technologies.

Education

MEng, Environmental and Water Resources Systems Engineering, Cornell University

BS, Environmental Engineering

Certification/License

Engineer in Training

Confined Space Entrant, Attendant, Entry Supervisor 2018

BEDC EHS Orientation, NYCDEP 2018

GI-P Design-3 – Green Infrastructure at Parks, New York City Department of Environmental Protection (NYCDEP), New York, NY
Assistant Engineer. Hazen is tasked with the planning and design of over twenty-two green infrastructure locations on New York City Department of Parks and Recreation (NYC Parks) properties across Brooklyn and Queens, NY. Ms. Takada coordinated with surveyors to finalize topographic data, provided geotechnical investigation and drain cleaning oversight, prepared geotechnical reports and permits, developed a streamlined cost estimating process, and developed conceptual design, advanced schematic design, 75% design, and 100% design for various project locations.

Right-of-Way Bioswales (ROWB), Right of Way Green Strips (ROWGS), Infiltration Basins (IB) and Stormwater Greenstreet (SGS) Design for Jamaica Bay Sewershed, New York City Economic Development Corporation (NYCEDC), Brooklyn and Queens, NY
Assistant Engineer. Hazen is tasked with siting and designing green infrastructure across 1,100 acres tributary to Jamaica Bay. Ms. Takada assisted in coordinating with surveyors to finalize topographic data for right-of-way green infrastructure. She also prepared geotechnical reports, reviewed contractor submittals, assisted in developing 60% design, 90% design, and final design construction drawings for the project area.

Right-of-Way Bioswales (ROWB), Right of Way Green Strips (ROWGS), Infiltration Basins (IB) Design for Coney Island Tributary, NYCDEP, Brooklyn, NY
Assistant Engineer. Hazen is tasked with siting and designing green infrastructure in the 574-acre Coney Island Tributary. Ms. Takada conducted field walkthroughs to site right-of-way green infrastructure practices according to hydraulic analysis and guidelines set by NYCDEP, New York City Department of Transportation (NYCDOT), and NYC Parks. She also provided geotechnical investigation oversight and assisted in developing 60% design construction drawings for the project area to contribute to consent order goals for NYCDEP.

Hazen

Right-of-Way Bioswales (ROWB), Right of Way Green Strips (ROWGS) and Stormwater Greenstreet (SGS) Design for East River Combined Sewer Overflow (CSO) Tributary Area, New York City Department of Design and Construction (NYCDDC), Queens, NY
Assistant Engineer. Hazen is tasked with siting and designing green infrastructure in the East River CSO Tributary Area. Ms. Takada provided geotechnical investigation oversight, contributed to geotechnical report preparation, and assisted in coordinating with surveyors to finalize topographic data for right-of way green infrastructure. This sited green infrastructure will then transition into full design to contribute to consent order goals for NYCDEP.

On-Site Green Infrastructure at Schools, NYC DEP, Brooklyn, NY
Assistant Engineer. Hazen is tasked with siting and designing green infrastructure at 6 schools in Brooklyn, New York on New York City School Construction Authority (NYCSCA) properties. Ms. Takada assisted in developing 75% design construction drawings for four schools.

Beach 67th Street Green Infrastructure Site Evaluation, NYCDEP, Queens, NY
Assistant Engineer. Hazen performed a geotechnical investigation to assess the feasibility of green infrastructure in medians along Beach 67th Street. Ms. Takada prepared geotechnical reports and conducted drilling inspections in support of geotechnical investigations in the right-of-way.

Site Evaluation for the South East Queens Flood Mitigation Program, NYCDEP, Queens, NY
Assistant Engineer. Hazen evaluated existing conditions at NYCDEP identified flooding hotspots in South East Queens and identified applicable flood mitigation solutions. Ms. Takada conducted field walkthroughs to evaluate existing conditions of hotspots.

Experience Prior to Hazen

Red Hook Wastewater Treatment Plant Storm Resiliency, NYCDEP, Brooklyn, NY
Provided design services for improvements to the Red Hook Wastewater Treatment Plant to mitigate flood damage from future events. Responsibilities included:

- Performing engineering activities associated with the preparation of Facility Plan (FP) report and Basis of Design Report (BODR)
- Calculating leakage rates of proposed flood adaptation strategies
- Developing an environmental sampling plan for the project
- Preparing presentation materials and graphics for the FP and BODR
- Requesting information from flood protection equipment suppliers and coordinating meetings between suppliers and D&B
- Communicating with NYCDEP and submitting project documents through e-Builder (PMIS)
- Reviewing Task Order Contract (TOC) Invoices

Sean DuPuis, PE

Structural

Mr. DuPuis is a civil engineer with over 15 years of expertise in structural assessments, analysis, design, and construction of facilities for municipal, federal, and private clients.

Education

M.S., Civil Engineering, Arizona State University, Arizona, CA

B.S., Civil Engineering, Arizona State University, Arizona, CA

Certification/License

Professional Engineer

Areas of Expertise

- Structural Assessment
- Structural Analysis
- Design and Construction
- Structural and Constructability Reviews of Water and Wastewater Design Projects
- Construction management and inspection

Professional Activities

- ASCE

Lead structural discipline and multi-discipline engineering and drafting project teams in development of construction documents including reports, calculations, drawings, and specifications. Perform technical structural and contractibility reviews for water and wastewater design projects and provides services during construction including review of shop drawings and product data, answering requests for information, structural observation, and quality control management.

Biosolids and Energy Phase I: Preliminary Design, Goleta Sanitary District (GSD), Goleta, CA

Structural Lead. This project is developing a Preliminary Design Report that includes preliminary design of a new digester and CHP facility, develop cost estimate for these facilities, conduct regulatory and environmental assessment, and provide conceptual layout of all expected facilities for construction.

Biosolids Loadout Condition Assessment, Eastern Municipal Water District, Perris, CA

Structural Lead. The biosolids loadout facility at the PVRWRRF has experienced failure of several components including loadout gates and loadout measurement cells. These failures have necessitated greatly increased operator involvement to keep the facility functioning. Hazen was appointed to evaluate current condition of the facility to recommend improvements that would restore it to reliable operation.

Delta Diablo Resource Recovery Facility Master Plan, Delta Diablo, Antioch, CA

Performed Level 1 condition assessment of structures at the Wastewater Treatment Plant checking for defects and distress in existing concrete and steel structures and providing recommendations for priority of repairs.

PFAS Treatment Project at MN Plant #2 Leland Thompson WTF, Rubidoux Community Services District, Jurupa Valley, CA

Structural Lead for design of foundations for GAC vessels, electrical equipment, pipe supports, and canopies.

Hazen

Centralized Groundwater Treatment PFAS/ PFOA Treatment, City of Monterey Park, Monterey Park, CA
Structural Lead for design of foundations for a mix of refurbished and new GAC vessels, electrical equipment, pipe supports, and access stairs. Delivery as part of a Design Build team with Filanc.

Skyfarm 'A' and Hansford Court Lift Station Reconstruction, City of Santa Rosa, Santa Rosa, CA
Structural Task Lead for update to the 2019 California Building Code for the Skyfarm 'A' and Hansford Court Lift Station Reconstruction project. The City needed to replace the damaged sewer lift stations from the 2017 Tubbs forest fire in order to serve residential housing which is being rebuilt in the area. The City would like to investigate hazard mitigation measures that will reduce the risk of damage to the facilities in the event of another disaster. Condition assessments and testing were performed at both lift stations to determine the extent of mechanical, electrical and structural replacements. Structural replacements at Skyfarm 'A' lift station include the entire lift station building superstructure and foundation, and standby generator foundation. The replacement building, which matches the same footprint of the existing lift station, consists of reinforced masonry shear walls designed for Seismic Design Category E, with fire resistant steel trusses and metal decking diaphragm roof system, supported on a concrete mat slab foundation. Structural replacements at Hansford Court lift station include replacement of concrete slab at grade around existing precast wet well, installation of a new buried precast concrete valve vault adjacent to the existing wet well, and standby generator foundation.

La Brea Subarea Groundwater Supply Project – Wells, Transmission Main, and Treatment Facilities, City of Beverly Hills, CA
Structural Calculation Reviewer for the City of Beverly Hills La Brea Subarea Groundwater Supply Project. This is a $50 M project the City is implementing to expand their local water supply by developing groundwater in the La Brea Subarea of the Central Groundwater Basin. The project includes three (3) groundwater wells to be drilled and equipped, 4-miles of raw water transmission main through the City of Los Angeles and Beverly Hills, and upgrade of the City's existing reverse osmosis treatment plant. The first phase of the project which Hazen is leading is the drilling and equipping of the first groundwater well, and construction of the 4-mile transmission main. Structural tasks include design of a well building with special reinforced masonry shear walls supporting a flexible roof diaphragm. The building roof system consists of cold-formed steel trusses supporting metal decking with rigid insulation and metal tile roofing. The well building was designed with a section of removable roof and removable walls to facilitate removal of the well pump and piping for maintenance or replacement.

Leo J. Vander Lans WTF Calcium Chloride Bulk Storage Expansion, Water Replenishment District of Southern California, Lakewood, CA
Structural Submittals Reviewer during Construction for the Calcium Chloride Bulk Storage Expansion Project. Calcium chloride is used at the Leo. J. Vander Lans Advanced Water Treatment Facility to stabilize reverse osmosis permeate prior to groundwater injection for the seawater barrier. The existing 5,000 gal calcium chloride storage tank does not provide adequate storage capacity when the plant operates at average flow, and for max 8 MGD design flow. Hazen recommended expanding storage by installing a new 5,000 gal storage tank. The structural scope included design of a conventionally reinforced, cast-in-place concrete containment structure for chemical storage, and cast-in-place concrete pipe trench with traffic rated precast covers used to connect the existing chemical containment structure with the new one. The design also includes a pre-engineered steel canopy structure over the chemical storage.

Christopher Portner, PE, CEP

Cost Estimating

Mr. Portner has provided cost estimating services for a wide-range of infrastructure related projects, including, but not limited to: water treatment and distribution, wastewater treatment and distribution, CSO reduction, recycled water treatment and distribution and roadway reconstruction. Mr. Portner is in AACE Certified Estimating Professional.

Education

MS, Environmental Engineering, University of California at Berkeley

BS, Civil and Environmental Engineering, University of California at Berkeley

Certification/License

Professional Engineer

Certified Estimating Professional (CEP)

Areas of Expertise

- Cost Estimating
- Wastewater Treatment Plant Design
- Wastewater Process Engineering
- Construction Management
- Scheduling
- Change Order Preparation and Negotiation
- Design Services During Construction

Professional Activities

Water Environment Federation (WEF)

American Association of Cost Engineers (AACEi)

California Water Environment Association (CWEA)

West Napa Pump Station Project, Napa, CA
Cost Estimator in charge of increasing the firm capacity of the pump station to 15.4 mgd, and address the aging infrastructure such as the seismic condition of the 40-year old existing facility. The existing pump station was congested with little to no room for expansion of pumping capacity. Project elements include a new submersible pump station, new electrical building and infrastructure, chemical injection for corrosion control, odor control, solar panels, demo of the existing pump station and site civil improvements.

Disinfection Improvements at the Laguna Treatment Plant, City of Santa Rosa, Santa Rosa, CA
Cost Engineer for the design of disinfection improvements at the 67-mgd Laguna Treatment Plant. The scope of work includes upgrade of the existing ultraviolet disinfection system to treat the entire 67-mgd plant flow, addition of a sodium hypochlorite system for disinfection of a side effluent stream and construction of a 35-mgd diversion pipeline to return off-spec water to the head of the plant.

JB Latham Miscellaneous Improvements, South Orange County Wastewater Authority, Dana Point, CA
Cost Engineer for design of the miscellaneous improvements at the JB Latham WWTP. Improvements included rehabilitation of existing grit basins, including replacement of existing piping, covers and valves as well as structural modifications. Additionally, replacement of the existing emergency generator and effluent flow meters and isolation valves were designed.

Hazen

EBMUD Struvite Control Project, Oakland, CA
Cost Engineer for a plant-wide assessment of struvite formation and assessment of control options at EBMUD's 168-mgd Main Wastewater Treatment Plant. The scope of work included field sampling, technological survey, process modeling, alternative evaluation and life cycle cost analysis of the centrate and dewatering systems.

Town of Windsor Influent Wet Well and Headworks Screening, Windsor, CA
Cost Engineer for the Influent Wet Well and Headworks Screening Project to provide upstream screening of the influent pump station and replacement of existing grit and fine screening equipment. The scope of work included alternative analysis of various vendors and technologies for both screening and grit washing equipment and detailed design of the selected alternatives. Cost estimating scope included new screening and grit equipment along with buried structures and process piping.

AB Diffusers, Instrumentation and Controls Project, Napa Sanitation District, CA
Cost Engineer for replacement of existing diffuser technology in two aeration basins at the 15-mgd Napa Sanitation wastewater treatment plant. Scope of work included alternative assessment and detailed design of the new aeration system, including control system modifications.

EBMUD Secondary Clarifier Technology Evaluation Assessment, Oakland, CA
Cost Engineer for the assessment and alternative evaluation for the secondary clarifiers. The scope of work includes an industry-wide survey of peripheral flow peripheral overflow clarifiers, stress testing, CFD modeling and alternative analysis.

Skyfarm 'A' and Hansford Court Lift Station Reconstruction, City of Santa Rosa, CA
Cost Estimator. Hazen was selected to provide a condition assessment, alternative analysis, detailed design and design services during construction for reconstruction of two of the City of Santa Rosa's wastewater lift stations. The lift stations were destroyed in the 2017 Tubbs fire. The reconstruction included replacement of existing lift station structures, pumps, electrical service, and associated electrical, mechanical and control components along with provisions for temporary pumping and power to ensure uninterrupted wastewater service to the surrounding residents. Since these lift stations were destroyed as part of a natural disaster, the design also required collaboration and coordination with the City and FEMA to comply with federal funding requirements.

Los Angeles Department of Water and Power, Treatment for San Fernando Groundwater Basin, Los Angeles, CA
Cost Engineer. The project is a large-scale groundwater remediation which may require advanced treatment. Role includes leading civil design for multiple water treatment plants. Civil design included trunkline piping, yard piping, off-site piping, grading, paving, drainage, and miscellaneous site improvements. Coordination with other disciplines including mechanical, electrical, instrumentation, architectural, and structural.

San Diego County Water Authority Planning Services for Task 2 – 1st Bifurcation FCF Alternatives Analysis, San Diego County Water Authority, San Diego, CA
Cost Estimator. This project includes preliminary alternatives analysis, planning level conceptual design and cost estimates, stakeholder coordination, environmental review and permitting evaluation for 11 bifurcation flow control facilities. Hazen team members completed an extensive alternatives evaluation that included several pipeline isolation alternatives for replacing the 11 existing bifurcations structures as well as identifying additional site improvements including security, treatment, and communications. The pipeline isolation alternatives evaluation included construction cost estimates for each alternative, and a shutdown cost and lifecycle cost evaluation for each alternative to better understand the total cost of implementing each alternative.

SARA J. HEAD, QEP

Principal Scientist

Yorke ENGINEERING, LLC
www.YorkeEngr.com

AREAS OF EXPERTISE

- Major Capital Projects and Renewable Energy Permitting and Impact Assessment
- Impact Mitigation Planning
- Air Quality Compliance Design, Implementation, and Management
- Environmental Impact Assessments, Reports, and Statements
- Federal, State, Province, and Local Regulatory Interface and Negotiation
- New Source Review Regulatory Consulting
- PSD Permitting
- Program Management for Project Permitting
- Project Feasibility, Siting, and Planning

EXPERIENCE

- Yorke Engineering, LLC Principal Scientist, 2016-Present
- AECOM, Vice President/Project Director, 2005-2016
- ENSR, Air Quality Department Manager, 1992-2005
- AeroVironment, Air Quality Specialist, 1976-1992

PROFESSIONAL CERTIFICATIONS/ ASSOCIATIONS

- Qualified Environmental Professional
- Air and Waste Management Association, Fellow Member and Past President
- Ventura County Air Pollution Control District (VCAPCD) Advisory Committee, Chair

EDUCATION

- B.S., Atmospheric Sciences, University of California at Davis

OVERVIEW

Ms. Head has 40 years of experience in environmental permitting and compliance. She has worked with many sanitation districts and water agencies to provide feasibility studies, California Environmental Quality Act (CEQA) analyses, and air permitting support. Air quality permitting is her expertise, and she has obtained Permits to Construct (PTCs), Prevention of Significant Deterioration (PSD) permits, and/or Title V permits for many sources, including water treatment plants, fossil fuel and renewable power plants, manufacturing facilities, refineries, and others. She has assisted with feasibility studies to investigate the use of biogas and biomass as a fuel for power generation, including performing regulatory analyses for these projects. She has also done many projects that require environmental review documents under CEQA and/or the National Environmental Policy Act (NEPA), in addition to preparing air quality impact analyses for these documents. Ms. Head is the co-author of an article on "Sailing Through CEQA" in the Winter 2017 issue of *Source*, the magazine of the California-Nevada Section of the American Water Works Association (AWWA). She has worked with clients within the South Coast Air Quality Management District (SCAQMD), including permitting and projects to prepare CEQA documents for many source types. She is currently the Chair of the VCAPCD Advisory Committee, where she has served for over 25 years, giving her a deep understanding of the air district rulemaking and ambient air quality standards attainment planning process.

REPRESENTATIVE PROJECT EXPERIENCE

Eastern Municipal Water District (EMWD)/Hazen and Sawyer, Biogas Utilization Study for Water Treatment Facilities, Riverside County, CA

Ms. Head led Yorke Engineering, LLC's (Yorke's) efforts to support a review of options for biogas utilization of four wastewater treatment facilities within the SCAQMD. The study looked at options for biogas utilization to reduce flaring and meet SCAQMD rules related to engines. The options included power generation and pipelining the biogas. Yorke's role focused on estimating baseline and projected emissions for each alternative for the facilities, current and projected emissions control technology requirements, regulatory planning implications, and air permitting feasibility.

Coachella Valley Water District (CVWD)/Hazen and Sawyer, HRA and Permitting of Water Treatment Facilities, Riverside County, CA

Under a new State law, CVWD was required to implement additional water treatment for the removal of chromium-6 from the groundwater. Ms. Head assisted with the preparation of a health risk assessment (HRA), using the Office of Environmental Health Hazard Assessment (OEHHA) guidelines, and a Technical Report to support the Environmental Impact Report (EIR) that was prepared for the project. Ms. Head also assisted with the preparation of PTC applications for the proposed new equipment, including process tanks, scrubbers, emergency generator engines, crystallizer, and control technology.

Delta Diablo, Feasibility Study and Wastewater Treatment Facility Permitting, Antioch, CA

Due to State regulations that require a reduction in the amount of waste going to landfills, Delta Diablo investigated options to generate and utilize biogas for energy production at its facility. Ms. Head led a study to investigate the feasibility of obtaining air permits from the Bay Area Air Quality Management District (BAAQMD) for several alternatives under consideration. Various alternatives for the processing of different wastes, including food, biomass, and biosolids/sludge, were reviewed in detail. The feasibility study included the calculation of emissions [including greenhouse gases (GHGs)], review of control technologies, determination of offset requirements, and other BAAQMD and federal rule applicability. An analysis showing the GHG emissions reduction benefits of the alternatives was performed. An HRA of a 500-tons-per-day food waste processing operation was prepared and used for the project Mitigated Negative Declaration (MND). Upon completion of the study, she oversaw the preparation of an air permit application submitted to the BAAQMD to obtain a permit for the selected configuration.

City of San Diego/Dudek, CEQA Air Quality Modeling and HRA Technical Report, San Diego, CA

The City of San Diego looked to implement the first phase of its Pure Water Program, including the addition of power generation equipment to its North County Water Reclamation Facility. Ms. Head managed Yorke's support on the project and assisted with the preparation of the Air Quality and HRA Technical Report used to support the project EIR.

Los Angeles Department of Water and Power (LADWP)/Dudek, Technical Report, Los Angeles, CA

LADWP proposed to install new paint booths, emergency generators, and other equipment at its Mid-Valley Water Facility. Ms. Head managed Yorke's tasks on the project and assisted with the preparation of an HRA Technical Report to support an MND being prepared for this project.

Southern California Edison (SCE), CEQA Addendums and Permitting, Southern California

SCE proposed to upgrade its five (5) power generation peaking plants located in Los Angeles, Orange, San Bernardino, and Ventura Counties. The projects were originally permitted with MNDs in 2007. CEQA Addendums were required to implement the four projects within the SCAQMD. Ms. Head managed Yorke's support on the project and assisted with the preparation of the Addendums. Major issues addressed in the Addendums included air quality impacts during commissioning, GHG emissions, and impacts related to the storage and transport of aqueous ammonia at a higher concentration than previously utilized. She also assisted with the preparation of Title V air permit applications for the modifications to be submitted to the SCAQMD for two of these facilities.

Ventura Regional Sanitation District (VRSD), Air Permitting Support, Ventura County, CA

Ms. Head provided air permitting support to VRSD for the Toland Road Landfill. The landfill includes microturbines fueled with landfill gas, a flare, and a biosolids processing facility. For this project, Ms. Head directed an update of the HRA to include the recently revised OEHHA risk factors, as well as updating the sulfur dioxide (SO_2) and hydrogen sulfide (H_2S) modeling to demonstrate compliance with VCAPCD Rule 54. These analyses were used in the application to increase the capacity of the flare.

JAMES YORKE, C.A.P.P., QISP

Environmental Engineer

Yorke ENGINEERING, LLC
www.YorkeEngr.com

AREAS OF EXPERTISE

- CEQA Air Quality and GHG Analysis Using CalEEMod
- Air Permitting
- GHG Reporting
- Storm Water Planning/SWPPPs
- TRI Reporting
- Hazardous Materials Planning and Reporting
- Mobile Source Regulations

EXPERIENCE

- Yorke Engineering, LLC Environmental Engineer 2018-Present

PROFESSIONAL CERTIFICATIONS

- Certified Air Permitting Professional, San Joaquin Valley Air Pollution Control District
- Accredited Greenhouse Gas Verifier, California Air Resources Board, 2020
- California Industrial General Permit Qualified Industrial Storm Water Practitioner, #01100, California Storm Water Quality Association, 2019

EDUCATION

- B.S., Mechanical Engineering and Materials Science and Engineering, Graduated with Honors, University of California, Berkeley, 2017

OVERVIEW

Mr. Yorke has worked with dozens of clients over the last 3 years with Yorke Engineering and has become a respected member of the team, with expertise in several specific areas and general knowledge in many service areas. He has worked with many industries, including metal casting, semiconductors, fiberglass and resin manufacturing, agriculture, health care, concrete pouring, cement manufacturing, composting, wastewater treatment, and more.

FIELDS OF EXPERIENCE

CEQA Air Quality and GHG Analysis Using CalEEMod

Mr. Yorke has experience determining if air pollutants or GHG emissions will be considered significant under the California Environmental Quality Act (CEQA) regulation. This is the first step in determining if a project will need a CEQA Air Quality or GHG Impact Analysis Technical Report as opposed to a Negative Declaration or Mitigated Negative Declaration. This activity is often completed using the California Emissions Estimator Model (CalEEMod) to determine emissions for air pollutants and GHGs and comparing these emissions to local and State significance thresholds.

Air Permitting

Mr. Yorke has been the lead on several significant permitting actions for wastewater, composting, semiconductor, and miscellaneous industrial engines. He has played a lead role in permitting evaluations for shoe manufacturing, semiconductor, and metal casting operations.

GHG Reporting

James has completed several simple greenhouse gas (GHG) reports for a variety of facilities, the most complicated of which is a winery, which included natural gas combustion at several units, biogas combustion for steam and electricity production, solar power, and production of several different products at two connected facilities.

Storm Water Planning/SWPPPs

Mr. Yorke is a California Industrial General Permit Qualified Industrial Storm Water Practitioner (QISP). He has worked on several California Storm Water Pollution Prevention Plans (SWPPPs). He also has experience with storm water sampling, working with laboratories to get storm water results, California

storm water reporting, and SWPPP monthly and annual inspections. Additionally, he has developed SWPPPs in Nevada.

TRI Reporting

James has submitted over 20 Toxics Release Inventory (TRI) reports for a variety of industries, including metal casting, medical testing, cement manufacturing, and asphalt manufacturing, and is well versed in the reporting requirements.

Hazardous Materials Planning and Reporting

Mr. Yorke has been involved with managing the California Environmental Reporting System (CERS) accounts for over 100 individual facilities for 10 or more companies. He has extensive experience in reporting hazardous materials and significant experience with aboveground and underground storage tanks. He also has experience with facilities planning to store hazardous materials on-site and how to develop a program to achieve compliance in an effective and efficient manner.

Mobile Source Regulations

Mr. Yorke has experience with over 20 clients in different industries dealing with the California Air Resources Board's (CARB's) Large Spark-Ignition (LSI), Off-Road Diesel (ORD), and On-Road Diesel (On-Road) Regulations and the Portable Equipment Registration Program (PERP). For LSI, he has experience in compliance determinations, planning to achieve compliance, and reporting in the Diesel Off-Road Online Reporting System (DOORS). For ORD, James has experience in compliance determinations and short-term and long-term planning for compliance utilizing CARB's Fleet Calculator Tool and DOORS reporting. For On-Road, he has experience in compliance determinations, planning to achieve compliance, and reporting in the Truck Regulation Upload, Compliance, and Reporting System (TRUCRS). Mr. Yorke also has some experience applying for PERP registrations.

Heather McDaniel McDevitt, RPA

Archaeologist

Heather McDaniel McDevitt is an archaeologist and cultural resources lead with 13 years' cultural resource management (CRM) experience throughout California and Baja California. Ms. McDaniel McDevitt has served as a field supervisor, lab director, principal investigator and project manager on Phase I, Extended Phase I, Phase II, and Phase III projects conducting surveys, testing, site significance evaluations and recordation, data recovery and laboratory analysis. Her education encompasses archaeology, biological anthropology, and GIS.

As a bioarchaeologist, Ms. McDaniel McDevitt combines physical anthropology and archaeology in the study of faunal and human remains to reveal ancient lifeways. Her specific area of GIS research is the use of predictive modeling and remote sensing to better understand settlement and subsistence patterns, which can be used to forecast areas of potential impacts and assist in mitigating damage to cultural resources more efficiently.

Ms. McDaniel McDevitt has worked on projects for the National Park Service, U.S. Environmental Protection Agency (EPA), National Aeronautics and Space Administration, U.S. Bureau of Land Management, the Smithsonian Institute, California State Parks, California Department of Transportation, and various private CRM and environmental firms. Ms. McDaniel McDevitt's professional experience in CRM provides significant knowledge and practical experience with state and federal regulations such as the National Environmental Policy Act (NEPA), Section 106 of the National Hictoric Preservation Act, and the California Environmental Quality Act (CEQA). Ms. McDaniel McDevitt has also served as an adjunct professor at community and state institutions for courses in physical and cultural anthropology, archaeology, and GIS.

Education

California State University, Northridge
MA, Public Archaeology
BA, Anthropology

Certifications

Registered Professional Archaeologist (RPA)

CEQA Training through Advanced, Association of Environmental Professionals

GIS Professional Certificate

HAZWOPER Training, Hydrogeologic

Professional Affiliations

American Anthropological Association

American Institute of Archaeology

California Geographical Society

Pacific Coast Archaeological Association

Register of Professional Archaeologists

Simi Valley Historical Society

Society for American Archaeology

Society for California Archaeology

Ventura County Archaeological Association

Project Experience

Lower Arroyo Burro Open Space Phase I Archaeological Survey Report and Historic Structures and Sites Report and Arroyo Burro Restoration at Barger Creek, Santa Barbara, CA. As Project Archaeologist, conducted intensive ground survey to determine the potential of cultural resources within two project areas and support of Historic Structures and Sites Investigation for the City of Santa Barbara, Parks and Recreation, Creeks Division for restoration of entire Arroyo Burro Creek Restoration effort.

Paradiso Residential Development, Santa Barbara County, California. As project manager, conducted Phase 1 and multiple Extended Phase I Archaeological Investigations, prepared technical reports and Construction Mitigation and Monitoring Treatment Plan. Currently serve as project manager for all archaeological and Native American monitoring, facilitation of pre and continual construction meetings, coordination and supervision of archaeological technician crew in all aspects, as well as necessary document preparation and agency/client consultation.

Phase 1, Extended and Supplemental Phase 1 Archaeological Investigation Santa Barbara Polo Villas, 3250-3282 Via Real, Carpinteria, California. As project archaeologist, conducted Extended Phase 1 Archaeological Investigation and supervised data recovery excavations. As field director, duties included project management, coordination and supervision of archaeological technician crew during excavations, as well as document and report preparation.

Phase I, Site Distribution Analysis and Extended Phase I Archaeological Investigation Oak Hills Project, Vandenberg Village, Santa Barbara County, California. As project archaeologist and field director, conducted initial Phase 1 intensive ground survey, designed and implemented research design to address concerns of local Tribe including intra-site analysis for all known archaeological sites located within a one-mile radius of Project site in order to determine potential for encountering unknown cultural resources based on the environmental and cultural landscape characteristics. Supervised excavations intended to determine presence or absence of cultural materials within proposed areas of ground disturbance, consulted with Native American representatives and composed final reports.

Burton Mound Collection, CA-SBA-28, Santa Barbara Museum of Natural History, Santa Barbara, California. Faunal analysis of collection resulting from an excavation conducted in 1969 by Dr. Claude Warren and housed at the Santa Barbara Museum of Natural History. The continued aims of this research, through faunal analysis, ethnographic investigations, and comparative analysis, are to better understand the interactions between Chumash mainland and island settlements, the timing and use of the Chumash watercraft, how climatic uncertainty affected subsistence and settlement patterns of the pre-European contact Chumash, and the effects of the mission period on area populations. Unpublished thesis: Exploration of Burton Mound: Faunal Analysis of a Mainland Chumash Site.

Las Positas Road at Cliff Drive Roundabout Phase I Archaeological Survey Report, Santa Barbara, CA. As project archaeologist conducted intensive ground survey to determine the potential of cultural resources within project area within right-of-way adjacent to significant prehistoric site, CA-SBA-575. Coordinated with City and Caltrans staff to define APE and composed report according to Caltrans requirements.

On-Call Countrywide Archaeological Services, County of Santa Barbara, Flood Control and Water Conservation District, Santa Barbara, California. As Project Manager, currently manages Dudek's on-call archaeological, historical, and Native American services, including but not limited to monitoring, archaeological record searches, historical research, architectural history, surveys for both prehistoric and historical resources, extended Phase I surveys, test excavations, data recovery, Native American coordination, coordination with the Native American Heritage Commission, AB 52 support, treatment protocols, feasibility/concept plan studies and recommendations, hiring and management of applicable sub consultants and specialty disciplines as required, preparation of management plans, and design and implementation of mitigation methods.

Extended Phase I and Phase II Archaeological Investigation Proposed Single Family Residence 5567 Calle Arena, Carpinteria, California. Serve as principal investigator and field director. Designed and implemented research design involving previously recorded archaeological site CA-SBA-7, recorded as the ethnohistoric Chumash village Mishopshnow and listed as component of California Historic Landmark No. 535. Supervised and conducted excavations intended to delineate horizontal and vertical extent of the site and site significance. Performed analysis on recovered remains, Native American consultation and preparation of final reports including avoidance/mitigation strategies.

GOLETA SANITARY
Water Resource Recovery District

Hazen

Hazen and Sawyer
7700 Irvine Center Drive • Suite 200 • Irvine, CA 92618

GENERAL MANAGER'S REPORT

GOLETA SANITARY DISTRICT
GENERAL MANAGER'S REPORT

The following summary report describes the District's activities from January 18, 2022 through February 7, 2022. It provides updated information on significant activities under three major categories: Collection System, Treatment/Reclamation and Disposal Facilities, and General and Administration Items.

1. COLLECTION SYSTEM REPORT

LINES CLEANING
Staff is conducting routine lines cleaning in the area of Turnpike Road and Hollister Avenue.

CCTV INSPECTION
Staff is conducting routine Closed-Circuit Television (CCTV) inspections in the same area as the routine lines cleaning operations.

GREASE AND OIL INSPECTIONS
Staff continues with the annual Grease and Oil inspections.

REPAIR AND MAINTENANCE
Staff has been informed by the City of Goleta that the Hollister Avenue bridge replacement at San Jose Creek will begin the summer of 2022 and extend into 2023. Staff is working with City of Goleta to coordinate work on affected District facilities. Staff repaired faulty wiring for the CCTVI truck water pump which services the sink and toilet.

GOLETA SANITARY DISTRICT FY 2021-22 PILOT PROJECTS
Staff is evaluating several emerging or previously unused technologies for possible inclusion into future Capital Improvement Projects (CIP). These include an epoxy fiberglass liner for manholes needing rehabilitation, the installation of an epoxy-composite manhole to prevent recurring corrosion concerns, stainless steel repair bands which eliminate the need for a traditional dig and repair for point damages on a sewer pipe and a cured-in-place pipe (CIPP) lateral connection repair which seals the entire wye and eliminates root intrusion at the cut out for the connection.

2021 CCTVI PROJECT REVIEW & ASSET MANAGEMENT PROGRAM UPDATE
Staff has received the preliminary recommendations for project groupings into Capital Improvement Projects from Hazen and Sawyer. Staff will review the recommendations and assist in the refining of the proposed CIPs for FY 2022-23 and subsequent years.

PROFESSIONAL DEVELOPMENT
Shamus O'Donnell, Collection System Supervisor, has completed the California State University, Sacramento Office of Water Programs Operation and Maintenance of Wastewater Collection Systems Volume 2 correspondence class. This is a 6-month duration, advanced class which focuses on management, organizational planning, safety, long-term planning and financial planning for collection systems.

CWEA COLLECTION SYSTEM OF THE YEAR AWARD

Staff has been informed that the District's Collection System has been chosen as one of three candidates for the state CWEA Collection System of the Year Award. The CWEA inspection team is scheduled to visit the District on Tuesday February 8, 2021. The award will be announced at the CWEA Annual Conference at Sacramento on April 14, 2022.

2. TREATMENT, RECLAMATION AND DISPOSAL FACILITIES REPORT

Plant flows have increased to an average of 4.7 million gallons per day (MGD) with UCSB returning to full in-person instruction, bringing plant flows back to near pre-pandemic levels. The demand for reclaimed water has begun to increase due to warmer temperatures. Flow concentrations and loadings during the weekends continue to cause intermittent challenges and various levels of plant interference. The Reclamation Disinfection Study by Hazen and Sawyer (Hazen) has completed the initial data collection and analysis. Conclusions to date demonstrate that there is a strong correlation between high total coliform values and surfactant concentrations. The next steps involve designing bench testing protocols for evaluating some of the proposed short-term solutions such as: peracetic/performic acid augmentation and enhanced coagulation/flocculation. Medium- and long-term solutions such as micro/nano-filtration and Ultraviolet Disinfection prior to chlorination will be evaluated at a feasibility level for cost and constructability.

Biofilter #2 has been modified to run as a mixed reactor, having both an aerobic (with oxygen) process and a submerged anaerobic (without oxygen) process. This modification will reduce the biological loading on the activated sludge process and hopefully will reduce the inhibitory impact of cleaning chemicals entering the plant. Currently, we are seeing Nitrogen removal across the biofilter of about 60% which corresponds to about 12.5% of the total treatment plant's Nitrogen removal. This reduction of nutrient loading on downstream processes has already provided a new level of overall process stability.

Centrifuge and dredging operations continue in lagoon #2. The District will be soliciting informal bids for biosolids hauling. Recently there have been issues with consistent hauling schedules primarily due to commercial driver shortages. Staff is monitoring this issue and will update the Board as needed.

The Lystek Thickened Waste Activated Sludge (TWAS) pre-treatment pilot project has been configured and tested. During the first week of the evaluation period, a few minor complications were discovered. The ideal concentration of TWAS was higher than the hoses carrying the material to the reactor could handle. New larger hoses have been ordered and will be installed. The higher solids concentration will greatly reduce the amount of propane required to reach the ideal temperature. Early results, however, show a significant increase in biogas. We hypothesize that the thermal alkaline hydrolysis process may be destroying inhibitory chemicals that have adsorbed onto the sludge. We will be testing this hypothesis by sampling for these chemicals before and after the reactor once a steady state during the demonstration period has been reached. Once the demonstration period is completed, a summary report of the results and proforma analysis

will be prepared and brought to the Board.

A notice to proceed on the Influent Pump Station Rehabilitation project has been issued. This starts the submittal and procurement process for the long lead-time items. Construction of the project may not start for another 6-9 months depending on the completion of the procurement process.

A workshop on the 90% design submittal of the Biosolids and Energy Strategic Plan (BESP) Phase 1 project was held on January 13, 2022. Detailed review by the electrical contractor, Rockwell Construction Services, LLC is underway. A workshop on the environmental document is scheduled for later this month. This project is scheduled to begin construction by the end of the calendar year and be completed by the end of 2023.

A proposal for the preliminary engineering design of the BESP Phases 2 & 3 improvements has been submitted by the Hazen team and has been reviewed by staff and the Board's Engineering Committee. The proposal is being brought to the full board for consideration on February 7, 2022.

3. GENERAL AND ADMINISTRATIVE ITEMS

Financial Report

The District account balances as of February 7, 2022 shown below are approximations to the nearest dollar and indicate the overall funds available to the District at this time.

Operating Checking Accounts:	$	851,774
Investment Accounts:	$	32,786,665
Total District Funds:	$	33,638,439

The following transactions are reported herein for the period 01/18/22 – 02/07/22

Regular, Overtime, Cash-outs and Net Payroll:	$	118,759
Claims:	$	482,144
Total Expenditures:	$	600,904
Total Deposits:	$	772,185

Transfers of funds:

LAIF to Community West Bank Operational (CWB):	$	- 0 -
CWB Operational to CWB Money Market:	$	- 0 -
CWB Money Market to CWB Operational:	$	- 0 -

The District's investments comply with the District's Investment Policy adopted per Resolution No. 16-606. The District has adequate funds to meet the next six months of normal operating expenses.

Local Agency Investment Fund (LAIF)

LAIF Monthly Statement – January, 2022

LAIF Quarterly Report – Previously submitted.

PMIA/LAIF Performance – Previously submitted.
PMIA Effective Yield – Previously submitted.

Community West Bank (CWB)
CWB Money Market Account – January, 2022

Deferred Compensation Accounts
CalPERS 457 Deferred Compensation Plan – Previously submitted.
Lincoln 457 Deferred Compensation Plan – January, 2022

Personnel Update
A verbal update will be provided at the meeting.

COVID-19 Response Plan Update
A verbal update will be provided at the meeting.

California State Treasurer
Fiona Ma, CPA

Local Agency Investment Fund
P.O. Box 942809
Sacramento, CA 94209-0001
(916) 653-3001

February 01, 2022

LAIF Home
PMIA Average Monthly Yields

GOLETA SANITARY DISTRICT

GENERAL MANAGER
ONE WILLIAM MOFFETT PLACE
GOLETA, CA 93117

Tran Type Definitions

Account Number: 70-42-002

January 2022 Statement

Effective Date	Transaction Date	Tran Type	Confirm Number	Web Confirm Number	Authorized Caller	Amount
1/14/2022	1/13/2022	QRD	1694649	N/A	SYSTEM	1,165.84

Account Summary

Total Deposit:	1,165.84	Beginning Balance:	2,025,102.07
Total Withdrawal:	0.00	Ending Balance:	2,026,267.91

PMIA/LAIF Performance Report as of 01/13/22

PMIA Average Monthly Effective Yields[1]

Dec	**0.212**
Nov	0.203
Oct	0.203

Quarterly Performance Quarter Ended 12/31/21

LAIF Apportionment Rate[2]:	0.23
LAIF Earnings Ratio[2]:	0.00000625812849570
LAIF Fair Value Factor[1]:	0.997439120
PMIA Daily[1]:	0.22%
PMIA Quarter to Date[1]:	0.21%
PMIA Average Life[1]:	340

Pooled Money Investment Account Monthly Portfolio Composition [1] 12/31/21 $181.4 billion

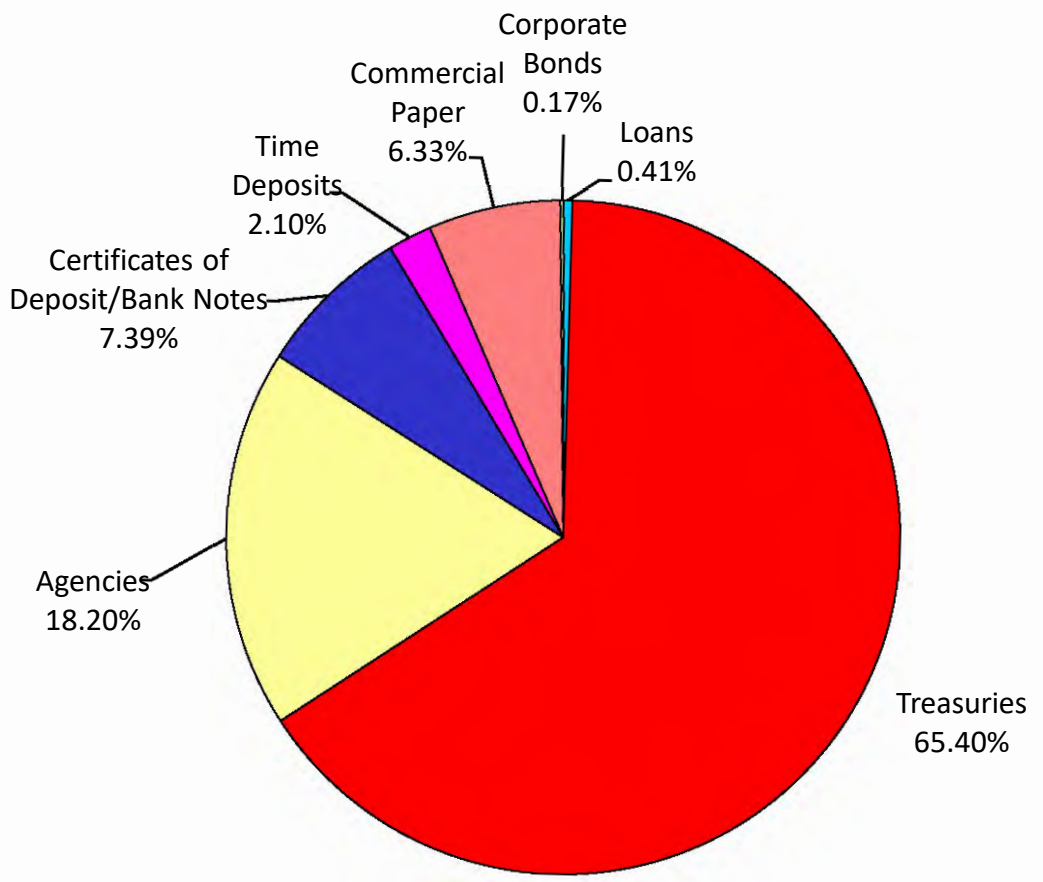


Chart does not include $6,716,000.00 in mortgages, which equates to 0.001%. Percentages may not total 100% due to rounding.

Daily rates are now available here. **View PMIA Daily Rates**

Notes: The apportionment rate includes interest earned on the CalPERS Supplemental Pension Payment pursuant to Government Code 20825 (c)(1) and interest earned on the Wildfire Fund loan pursuant to Public Utility Code 3288 (a).

Source:
[1] State of California, Office of the Treasurer
[2] State of Calfiornia, Office of the Controller

Community West Bank
445 Pine Avenue
Goleta, CA 93117

Statement Ending 01/31/2022

GOLETA SANITARY DISTRICT
Customer Number: XXXXXXXX5554

RETURN SERVICE REQUESTED

GOLETA SANITARY DISTRICT
MONEY MARKET
1 WILLIAM MOFFETT PL
GOLETA CA 93117-3901

Summary of Accounts

Account Type	Account Number	Ending Balance
PUBLIC AGENCY-MMDA	XXXXXXXX5554	$30,760,397.12

PUBLIC AGENCY-MMDA - XXXXXXXX5554

Account Summary

Date	Description	Amount		
01/01/2022	**Beginning Balance**	**$30,752,561.54**	Average Ledger Balance	$30,752,561.54
	1 Credit(s) This Period	$7,835.58		
	0 Debit(s) This Period	$0.00		
01/31/2022	**Ending Balance**	**$30,760,397.12**		

Account Activity

Post Date	Description	Debits	Credits	Balance
01/01/2022	**Beginning Balance**			**$30,752,561.54**
01/31/2022	INTEREST AT .3000 %		$7,835.58	$30,760,397.12
01/31/2022	**Ending Balance**			**$30,760,397.12**

Daily Balances

Date	Amount
01/31/2022	$30,760,397.12

Lincoln Financial Group℠

Multi-Fund®

MultiFund

Performance Update

Quoted performance data represents past performance. Past performance does not guarantee nor predict future performance. Current performance may be lower or higher than the performance data quoted. Please keep in mind that double-digit returns are highly unusual and cannot be sustained.

Variable products are sold by prospectus. Consider the investment objectives, risks, charges, and expenses of the variable product and its underlying investment options carefully before investing. The prospectus contains this and other information about the variable product and its underlying investment options. Please review the prospectus available online for additional information. Read it carefully before investing.

Investment return and principal value of an investment will fluctuate so that an investor's unit values, when redeemed, may be worth more or less than their original cost.

Monthly hypothetical performance adjusted for contract fees *

						Average Annual Total Return (%) as of 1/31/2022						
Investment Options		Inception Date	Change from Previous Day	YTD as of 01/31/2022	YTD as of 01/31/2022	1 Mo	3 Mo	1 Yr	3 Yr	5 Yr	10 Yr	Since Incep.
Risk Managed												
Fidelity® VIP Freedom 2055 Portfolio℠ - Service Class[6, 9]	RM	04/11/2019	2.01	-4.43	-4.43	-4.43	-3.45	11.74	N/A	N/A	N/A	14.34
Fidelity® VIP Freedom 2060 Portfolio℠ - Service Class[6, 9]	RM	04/11/2019	2.02	-4.39	-4.39	-4.39	-3.46	11.78	N/A	N/A	N/A	14.37
Maximum Capital Appreciation												
AB VPS Global Thematic Growth Portfolio - Class B[1, 2]	MCA	01/11/1996	2.99	-12.18	-12.18	-12.18	-10.99	6.55	20.57	16.41	11.19	6.04
DWS Alternative Asset Allocation VIP Portfolio - Class A[1, 2, 3, 6, 7]	MCA	02/02/2009	0.81	-1.87	-1.87	-1.87	-2.04	9.38	7.27	4.32	2.64	4.62
LVIP Baron Growth Opportunities Fund - Service Class[4]	MCA	10/01/1998	3.07	-13.16	-13.16	-13.16	-13.66	3.89	18.36	16.54	13.37	11.24
LVIP Delaware SMID Cap Core Fund - Standard Class[4, 5]	MCA	07/12/1991	2.29	-6.70	-6.70	-6.70	-6.57	11.80	12.78	9.89	10.66	9.26
LVIP SSGA Emerging Markets 100 Fund - Standard Class[1, 19]	MCA	06/18/2008	1.49	2.05	2.05	2.05	1.47	10.63	3.40	3.61	0.91	2.71
LVIP SSGA Small-Cap Index Fund - Standard Class[4, 18]	MCA	04/18/1986	3.03	-9.73	-9.73	-9.73	-11.78	-2.40	10.41	8.16	9.76	7.01
LVIP T. Rowe Price Structured Mid-Cap Growth Fund - Standard Class[4]	MCA	02/03/1994	3.90	-12.76	-12.76	-12.76	-15.37	-1.28	16.25	14.88	13.36	7.15
Long Term Growth												
American Funds Global Growth Fund - Class 2[1]	LTG	04/30/1997	2.33	-8.45	-8.45	-8.45	-8.82	4.66	18.75	15.54	12.75	9.42
American Funds Growth Fund - Class 2	LTG	02/08/1984	3.59	-9.09	-9.09	-9.09	-10.31	9.63	25.13	20.81	16.59	12.31

Performance Update

MultiFund

Monthly hypothetical performance adjusted for contract fees *

Investment Options		Inception Date	Change from Previous Day	YTD as of 01/31/2022	YTD as of 01/31/2022	Average Annual Total Return (%) as of 1/31/2022 1 Mo	3 Mo	1 Yr	3 Yr	5 Yr	10 Yr	Since Incep.
American Funds International Fund - Class 2[1]	LTG	05/01/1990	2.29	-5.70	-5.70	-5.70	-9.89	-6.09	5.51	6.22	5.80	6.51
Delaware VIP Small Cap Value[4, 5]	LTG	12/27/1993	1.63	-4.08	-4.08	-4.08	0.60	25.74	12.02	7.05	9.48	9.35
Fidelity® VIP Contrafund® Portfolio - Service Class	LTG	01/03/1995	2.55	-8.65	-8.65	-8.65	-6.72	16.69	21.10	16.10	13.75	10.83
Fidelity® VIP Growth Portfolio - Service Class	LTG	10/09/1986	2.73	-8.50	-8.50	-8.50	-8.27	10.56	24.73	21.44	16.73	10.21
LVIP BlackRock Global Real Estate Fund - Standard Class[1, 2, 9]	LTG	04/30/2007	1.68	-5.68	-5.68	-5.68	-2.92	20.14	9.00	7.37	6.35	1.91
LVIP Delaware Mid Cap Value Fund - Standard Class[4, 5]	LTG	12/28/1981	1.64	-4.17	-4.17	-4.17	0.43	25.50	13.04	9.06	10.94	10.45
LVIP Delaware Social Awareness Fund - Standard Class[5]	LTG	05/02/1988	1.88	-6.02	-6.02	-6.02	-4.13	17.89	18.80	14.87	13.39	10.17
LVIP Dimensional U.S. Core Equity 1 Fund - Standard Class	LTG	12/28/1981	1.84	-5.26	-5.26	-5.26	-2.27	19.69	17.80	13.93	13.11	9.95
LVIP Mondrian International Value Fund - Standard Class[1]	LTG	05/01/1991	0.85	2.15	2.15	2.15	1.20	13.09	5.35	5.08	4.76	5.36
LVIP SSGA International Index Fund - Standard Class[1, 18, 20]	LTG	04/30/2008	1.59	-3.92	-3.92	-3.92	-3.89	7.24	8.44	6.84	5.67	1.77
LVIP SSGA S&P 500 Index Fund - Standard Class[18, 21]	LTG	05/01/2000	1.88	-5.26	-5.26	-5.26	-1.90	21.80	19.22	15.34	14.00	6.04
LVIP Vanguard Domestic Equity ETF Fund - Service Class[6, 22]	LTG	04/29/2011	1.94	-5.96	-5.96	-5.96	-3.65	17.72	18.03	14.26	12.86	11.43
LVIP Vanguard International Equity ETF Fund - Service Class[1, 6, 22]	LTG	04/29/2011	1.99	-3.17	-3.17	-3.17	-4.25	3.51	8.27	6.95	5.34	3.37
MFS® VIT Utilities Series - Initial Class[2]	LTG	01/03/1995	1.42	-3.37	-3.37	-3.37	1.36	10.74	10.19	9.37	8.39	10.07
Growth and Income												
American Funds Growth-Income Fund - Class 2	GI	02/08/1984	1.82	-5.98	-5.98	-5.98	-4.20	16.93	14.83	13.10	12.98	10.22
BlackRock Global Allocation V.I. Fund - Class I[1, 3]	GI	02/28/1992	1.30	-4.02	-4.02	-4.02	-4.59	1.92	10.53	7.60	5.93	6.35
Fidelity® VIP Freedom 2020 Portfolio℠ - Service Class[6, 8]	GI	04/26/2005	1.08	-3.27	-3.27	-3.27	-2.72	5.13	10.48	8.36	7.31	5.97
Fidelity® VIP Freedom 2025 Portfolio℠ - Service Class[6, 8]	GI	04/26/2005	1.29	-3.46	-3.46	-3.46	-2.85	6.15	11.48	9.10	8.20	6.52

Performance Update

MultiFund

Monthly hypothetical performance adjusted for contract fees *

Investment Options		Inception Date	Change from Previous Day	YTD as of 01/31/2022	YTD as of 01/31/2022	Average Annual Total Return (%) as of 1/31/2022 1 Mo	3 Mo	1 Yr	3 Yr	5 Yr	10 Yr	Since Incep.
Fidelity® VIP Freedom 2030 Portfolio℠ - Service Class[6, 8]	GI	04/26/2005	1.40	-3.72	-3.72	-3.72	-3.02	7.33	12.70	10.19	8.98	6.82
Fidelity® VIP Freedom 2035 Portfolio℠ - Service Class[6, 8]	GI	04/08/2009	1.73	-4.09	-4.09	-4.09	-3.27	9.91	14.58	11.51	10.03	11.76
Fidelity® VIP Freedom 2040 Portfolio℠ - Service Class[6, 8]	GI	04/08/2009	1.98	-4.43	-4.43	-4.43	-3.46	11.74	15.75	12.15	10.40	12.13
Fidelity® VIP Freedom 2045 Portfolio℠ - Service Class[6, 8]	GI	04/08/2009	2.00	-4.43	-4.43	-4.43	-3.45	11.71	15.73	12.15	10.48	12.21
Fidelity® VIP Freedom 2050 Portfolio℠ - Service Class[6, 8]	GI	04/08/2009	1.98	-4.46	-4.46	-4.46	-3.45	11.74	15.73	12.15	10.53	12.32
LVIP BlackRock Advantage Allocation Fund - Standard Class[3, 5, 10]	GI	07/28/1988	1.00	-3.55	-3.55	-3.55	-2.65	3.21	8.32	6.88	5.97	5.74
LVIP Delaware REIT Fund - Standard Class[2, 5, 9]	GI	05/04/1998	1.09	-7.26	-7.26	-7.26	0.22	32.01	9.37	6.34	7.47	7.92
LVIP Delaware Value Fund - Standard Class[5]	GI	07/28/1988	0.62	-0.72	-0.72	-0.72	3.61	22.48	10.12	9.15	11.17	8.07
LVIP Delaware Wealth Builder Fund - Standard Class[3, 5, 10]	GI	08/03/1987	0.69	-2.35	-2.35	-2.35	-0.37	8.96	7.52	5.93	6.21	6.03
LVIP JPMorgan Retirement Income Fund - Standard Class[3, 5, 10]	GI	04/27/1983	0.70	-3.21	-3.21	-3.21	-2.77	1.85	6.19	4.99	4.60	6.49
Income												
LVIP BlackRock Inflation Protected Bond Fund - Standard Class[12]	I	04/30/2010	0.12	-0.80	-0.80	-0.80	0.01	2.36	3.65	2.39	0.63	1.76
LVIP Delaware Bond Fund - Standard Class[5, 12]	I	12/28/1981	-0.02	-2.34	-2.34	-2.34	-2.70	-4.52	3.28	2.48	1.93	6.40
LVIP Delaware Diversified Floating Rate Fund[5, 14]	I	04/30/2010	-0.03	-0.29	-0.29	-0.29	-0.50	-1.29	0.41	0.48	0.28	0.20
LVIP Delaware Diversified Income Fund - Standard Class[5, 12]	I	05/16/2003	0.01	-2.32	-2.32	-2.32	-2.65	-3.98	3.96	2.88	2.19	4.08
LVIP Delaware High Yield Fund - Standard Class[5, 12, 15]	I	07/28/1988	0.06	-2.64	-2.64	-2.64	-1.78	1.21	5.62	4.23	4.47	5.55
LVIP Global Income Fund - Standard Class[1, 10, 12, 13]	I	05/04/2009	0.05	-1.63	-1.63	-1.63	-2.05	-6.75	0.70	1.60	0.46	2.03
LVIP SSGA Bond Index Fund - Standard Class[12, 18]	I	04/30/2008	-0.03	-2.17	-2.17	-2.17	-2.48	-4.33	2.37	1.75	1.23	2.20
PIMCO VIT Total Return Portfolio - Administrative Class[12]	I	12/31/1997	0.00	-1.96	-1.96	-1.96	-1.97	-3.64	2.96	2.37	1.99	4.04

Performance Update

MultiFund

Monthly hypothetical performance adjusted for contract fees *

Investment Options		Inception Date	Change from Previous Day	YTD as of 01/31/2022	YTD as of 01/31/2022	Average Annual Total Return (%) as of 1/31/2022 1 Mo	3 Mo	1 Yr	3 Yr	5 Yr	10 Yr	Since Incep.
Risk Managed - Asset Allocation												
LVIP Global Conservative Allocation Managed Risk Fund - Standard Class[1, 3, 6, 10, 16]	RMAA	05/03/2005	0.80	-3.83	-3.83	-3.83	-3.31	2.91	5.89	4.85	4.54	4.74
LVIP Global Growth Allocation Managed Risk Fund - Standard Class[1, 3, 6, 10, 16]	RMAA	05/03/2005	1.15	-4.70	-4.70	-4.70	-3.84	6.71	7.30	5.95	5.01	4.54
LVIP Global Moderate Allocation Managed Risk Fund - Standard Class[1, 3, 6, 10, 16]	RMAA	05/03/2005	0.96	-4.40	-4.40	-4.40	-3.64	5.20	6.67	5.54	4.74	4.69
LVIP SSGA Global Tactical Allocation Managed Volatility Fund - Standard Class[1, 3, 6, 10, 11, 13]	RMAA	05/03/2005	0.92	-3.13	-3.13	-3.13	-2.29	7.78	7.77	5.94	4.50	3.87
Preservation of Capital												
LVIP Government Money Market Fund - Standard Class[10, 17]	PC	01/07/1982	-0.01	-0.08	-0.08	-0.08	-0.25	-0.99	-0.37	-0.23	-0.60	2.67
Risk Managed - US Large Cap												
LVIP BlackRock Dividend Value Managed Volatility Fund - Standard Class[10, 11]	RMUSL	02/03/1994	0.75	0.72	0.72	0.72	1.81	23.53	11.99	8.59	7.72	6.84
LVIP Blended Large Cap Growth Managed Volatility Fund - Standard Class[10, 11, 13]	RMUSL	02/03/1994	2.79	-9.40	-9.40	-9.40	-6.12	18.57	18.01	14.25	10.75	7.29
Asset Allocation												
LVIP T. Rowe Price 2010 Fund (Standard Class)[6, 8, 10]	AsA	05/01/2007	0.87	-3.41	-3.41	-3.41	-3.21	4.18	8.25	6.15	4.88	4.02
LVIP T. Rowe Price 2020 Fund (Standard Class)[6, 8, 10]	AsA	05/01/2007	1.02	-3.71	-3.71	-3.71	-3.45	5.42	9.56	7.25	5.56	4.14
LVIP T. Rowe Price 2030 Fund (Standard Class)[6, 8, 10]	AsA	05/01/2007	1.40	-4.40	-4.40	-4.40	-4.00	7.94	11.64	8.49	6.20	4.42
LVIP T. Rowe Price 2040 Fund (Standard Class)[6, 8, 10]	AsA	05/01/2007	1.78	-4.98	-4.98	-4.98	-4.43	10.36	13.35	9.57	6.81	4.40
LVIP T. Rowe Price 2050 Fund (Standard Class)[6, 8, 10]	AsA	04/29/2011	1.91	-5.11	-5.11	-5.11	-4.50	11.23	13.87	10.38	7.34	5.85
LVIP T. Rowe Price 2060 Fund - Standard Class[6, 8, 10]	AsA	04/30/2020	1.94	-5.09	-5.09	-5.09	-4.55	11.92	N/A	N/A	N/A	25.26
Risk Managed - US Mid Cap												

Performance Update

MultiFund

Monthly hypothetical performance adjusted for contract fees *

Investment Options		Inception Date	Change from Previous Day	YTD as of 01/31/2022	YTD as of 01/31/2022	Average Annual Total Return (%) as of 1/31/2022 1 Mo	3 Mo	1 Yr	3 Yr	5 Yr	10 Yr	Since Incep.
LVIP Blended Mid Cap Managed Volatility Fund - Standard Class[4, 10, 11, 13]	RMUSM	05/01/2001	3.13	-13.38	-13.38	-13.38	-14.91	-1.38	13.54	12.70	7.16	4.53
LVIP JPMorgan Select Mid Cap Value Managed Volatility Fund - Standard Class[4, 10, 11, 13]	RMUSM	05/01/2001	1.24	-3.13	-3.13	-3.13	-0.52	23.79	11.19	7.07	7.08	6.30
Risk Managed - Global/International												
LVIP Franklin Templeton Global Equity Managed Volatility Fund - Standard Class[1, 10, 11]	RMGI	08/01/1985	1.32	-2.97	-2.97	-2.97	-2.12	14.61	10.88	8.14	6.36	7.14
LVIP SSGA International Managed Volatility Fund - Standard Class[1, 6, 10, 11]	RMGI	12/31/2013	1.57	-3.93	-3.93	-3.93	-3.96	6.94	5.12	4.79	N/A	1.13

* These returns are measured from the inception date of the fund and predate its availability as an investment option in the variable annuity (separate account). This hypothetical representation depicts how the investment option would have performed had the fund been available in the variable annuity during the time period. It includes deductions for the M&E charge and the contract administrative fee. If selected above, the cost for the i4LIFE® Advantage feature or a death benefit will be reflected. The cost for other riders with quarterly charges is not reflected. No surrender charge and no annual contract charge is reflected.

Performance Update

[1] International
Investing internationally involves risks not associated with investing solely in the United States, such as currency fluctuation, political or regulatory risk, currency exchange rate changes, differences in accounting and the limited availability of information.

[2] Sector Funds
Funds that target exposure to one region or industry may carry greater risk and higher volatility than more broadly diversified funds.

[3] Asset Allocation Portfolios
Asset allocation does not ensure a profit, nor protect against loss in a declining market.

[4] Small & Mid Cap
Funds that invest in small and/or midsize company stocks may be more volatile and involve greater risk, particularly in the short term, than those investing in larger, more established companies.

[5] Macquarie Investment Management
Investments in Delaware VIP Series, Delaware Funds, Ivy Variable Insurance Portfolios, Ivy Funds, LVIP Delaware Funds or Lincoln Life accounts managed by Macquarie Investment Management Advisers, a series of Macquarie Investments Management Business Trust, are not and will not be deposits with or liabilities of Macquarie Bank Limited ABN 46 008 583 542 and its holding companies, including their subsidiaries or related companies, and are subject to investment risk, including possible delays in repayment and loss of income and capital invested. No Macquarie Group company guarantees or will guarantee the performance of the fund, the repayment of capital from the fund, or any particular rate of return.

[6] Fund of funds
Each fund is operated as a fund of funds that invests primarily in one or more other funds, rather than in individual securities. A fund of this nature may be more expensive than other investment options because it has additional levels of expenses. From time to time, the Fund's advisor may modify the asset allocation to the underlying funds and may add new funds. A Fund's actual allocation may vary from the target strategic allocation at any point in time. Additionally, the Fund's advisor may directly manage assets of the underlying funds for a variety of purposes.

[7] Alternative Funds
Certain funds (sometimes called "alternative funds") expect to invest in (or may invest in some) positions that emphasize alternative investment strategies and/or nontraditional asset classes and, as a result, are subject to the risk factors of those asset classes and/or investment strategies. Some of those risks may include general economic risk, geopolitical risk, commodity-price volatility, counterparty and settlement risk, currency risk, derivatives risk, emerging markets risk, foreign securities risk, high-yield bond exposure, index investing risk, exchange-traded notes risk, industry concentration risk, leveraging risk, real estate investment risk, master limited partnership risk, master limited partnership tax risk, energy infrastructure companies risk, sector risk, short sale risk, direct investment risk, hard assets sector risk, active trading and "overlay" risks, event-driven investing risk, global macro strategies risk, temporary defensive positions and large cash positions. If you are considering investing in alternative investment funds, you should ensure that you understand the complex investment strategies sometimes employed and be prepared to tolerate the risks of such asset classes. For a complete list of risks, as well as a discussion of risk and investment strategies, please refer to the fund's prospectus. The fund may invest in derivatives, including futures, options, forwards and swaps. Investments in derivatives may cause the fund's losses to be greater than if it invested only in conventional securities and can cause the fund to be more volatile. Derivatives involve risks different from, or possibly greater than, the risks associated with other investments. The fund's use of derivatives may cause the fund's investment returns to be impacted by the performance of securities the fund does not own and may result in the fund's total investment exposure exceeding the value of its portfolio.

[8] Target-date funds
The target date is the approximate date when investors plan to retire or start withdrawing their money. Some target-date funds make no changes in asset allocation after the target date is reached; other target-date funds continue to make asset allocation changes following the target date. (See the prospectus for the funds allocation strategy.) The principal value is not guaranteed at any time, including at the target date. An asset allocation strategy does not guarantee performance or protect against investment losses. A "fund of funds" may be more expensive than other types of investment options because it has additional levels of expenses.

[9] REIT
A real estate investment trust (REIT) involves risks such as refinancing, economic conditions in the real estate industry, declines in property values, dependency on real estate management, changes in property taxes, changes in interest rates and other risks associated with a portfolio that concentrates its investments in one sector or geographic region.

[10] Manager of managers funds
Subject to approval of the fund's board, Lincoln Investment Advisors Corporation (LIAC) has the right to engage or terminate a subadvisor at any time, without a shareholder vote, based on an exemptive order from the Securities and Exchange Commission. LIAC is responsible for overseeing all subadvisors for funds relying on this exemptive order.

[11] Managed Volatility Strategy
The fund's managed volatility strategy is not a guarantee, and the fund's shareholders may experience losses. The fund employs hedging strategies designed to reduce overall portfolio volatility. The use of these hedging strategies may limit the upside participation of the fund in rising equity markets relative to unhedged funds, and the effectiveness of such strategies may be impacted during periods of rapid or extreme market events.

[12] Bonds
The return of principal in bond funds is not guaranteed. Bond funds have the same interest rate, inflation, credit, duration, prepayment and market risks that are associated with the underlying bonds owned by the fund or account.

[13] Multimanager
For those funds that employ a multimanager structure, the fund's advisor is responsible for overseeing the subadvisors. While the investment styles employed by the fund's subadvisors are intended to be complementary, they may not, in fact, be complementary. A multimanager approach may result in more exposure to certain types of securities risks and in higher portfolio turnover.

[14] Floating rate funds
Floating rate funds should not be considered alternatives to CDs or money market funds and should not be considered as cash alternatives.

[15] High-yield or mortgage-backed funds
High-yield funds may invest in high-yield or lower rated fixed income securities (junk bonds) or mortgage-backed securities with exposure to subprime mortgages, which may experience higher volatility and increased risk of nonpayment or default.

Performance Update

[16] **Risk Management Strategy**
The fund's risk management strategy is not a guarantee, and the funds shareholders may experience losses. The fund employs hedging strategies designed to provide downside protection during sharp downward movements in equity markets. The use of these hedging strategies may limit the upside participation of the fund in rising equity markets relative to other unhedged funds, and the effectiveness of such strategies may be impacted during periods of rapid or extreme market events.

[17] **Money Market Funds**
You can lose money by investing in the fund. Although the fund seeks to preserve the value of your investment at $1.00 per share (or, for the LVIP Government Money Market Fund, at $10.00 per share), it cannot guarantee it will do so. An investment in the fund is not insured or guaranteed by the Federal Deposit Insurance Corporation or any other government agency. The fund's sponsor has no legal obligation to provide financial support to the fund, and you should not expect that the sponsor will provide financial support to the fund at any time.

[18] **Index**
An index is unmanaged, and one cannot invest directly in an index. Indices do not reflect the deduction of any fees.

[19] **Emerging Markets**
Investing in emerging markets can be riskier than investing in well-established foreign markets. International investing involves special risks not found in domestic investing, including increased political, social and economic instability, all of which are magnified in emerging markets.

[20] **MSCI**
The fund described herein is indexed to an MSCI® index. It is not sponsored, endorsed, or promoted by MSCI®, and MSCI®; bears no liability with respect to any such fund or to an index on which a fund is based. The prospectus and statement of additional information contain a more detailed description of the limited relationship MSCI®; has with Lincoln Investment Advisors Corporation and any related funds.

[21] **S&P**
The Index to which this fund is managed is a product of S&P Dow Jones Indices LLC (SPDJI) and has been licensed for use by one or more of the portfolio's service providers (licensee). Standard & Poor's®; and S&P® are registered trademarks of Standard & Poor's Financial Services LLC (S&P); Dow Jones® is a registered trademark of Dow Jones Trademark Holdings LLC (Dow Jones); and these trademarks have been licensed for use by SPDJI and sublicensed for certain purposes by the licensee. S&P®, S&P GSCI® and the Index are trademarks of S&P and have been licensed for use by SPDJI and its affiliates and sublicensed for certain purposes by the licensee. The Index is not owned, endorsed, or approved by or associated with any additional third party. The licensee's products are not sponsored, endorsed, sold or promoted by SPDJI, Dow Jones, S&P, their respective affiliates, or their third party licensors, and none of these parties or their respective affiliates or third party licensors make any representation regarding the advisability of investing in such products, nor do they have liability for any errors, omissions, or interruptions of the Index®.

[22] **Exchange-traded funds**
Exchange-traded funds (ETFs) in this lineup are available through collective trusts or mutual funds. Investors cannot invest directly in an ETF.

Important Disclosures

Variable products are issued by The Lincoln National Life Insurance Company, Fort Wayne, IN, distributed by Lincoln Financial Distributors, Inc., and offered by broker/dealers with an effective selling agreement. The Lincoln National Life Insurance Company is not authorized nor does it solicit business in the state of New York. **Contractual obligations are backed by the claims-paying ability of The Lincoln National Life Insurance Company.**

Limitations and exclusions may apply.

Lincoln Financial Group is the marketing name for Lincoln National Corporation and its affiliates. Affiliates are separately responsible for their own financial and contractual obligations.

Asset Categories

RM	= Risk Managed
MCA	= Maximum Capital Appreciation
LTG	= Long Term Growth
GI	= Growth and Income
I	= Income
RMAA	= Risk Managed - Asset Allocation
PC	= Preservation of Capital
RMUSL	= Risk Managed - US Large Cap
AsA	= Asset Allocation
RMUSM	= Risk Managed - US Mid Cap
RMGI	= Risk Managed - Global/International

DISTRICT CORRESPONDENCE

Board Meeting of February 7, 2022

Date: **Correspondence Sent To:**

1. 01/18/2022 Morgan Krapes-Kiah
   Flowers and Associates, Inc.
   Subject: Sewer Service Availability
   Proposed Annexation and Sewer Service Connection for Proposed 1,500 SF Nursery Facility Building
   A.P.N. 065-250-005 at 5925 Shoreline Drive, Santa Barbara

2. 01/18/2022 Jisela Ramos
   RRM Design Group
   Subject: Sewer Service Availability for 21 New Residential Units
   A.P.N. 061-070-002 at 4555 Hollister Ave., Santa Barbara CA

3. 01/19/2022 Zacharias Hunt
   ZWORLD GIS
   Subject: 2022 Digital Aerial Imagery Project

4. 01/19/2022 Sal Hernandez, Jr.
   Raytheon Technologies – Self Protect Systems
   Subject: Industrial Waste Control Program Permit Number C-349-25
   Industrial Waste Control Program Permit Letters were also sent to:
   - Bardex Corporation
   - Santa Barbara Airbus
   - Kyocera – SLD, Inc.
   - Karl Storz Imaging, Inc.
   - Soilmoisture Equipment Corporation
   - Advanced Vision Science
   - Santa Barbara County Sheriff Coroner's Office
   - Santa Barbara News Press
   - AgRx
   - RRM, Inc. / Westside Gas
   - Mission Support & Test Services (x 2 facility permits)
   - Goleta Water District (x 8 well sites)
   - Goleta Valley Cottage Hospital
   - AMTRAK
   - TSP Filter dba MANN+HUMMEL Water & Fluid Solutions, Inc.
   - Santa Barbara Airport

DISTRICT CORRESPONDENCE

Board Meeting of February 7, 2022

5. 01/19/2022 Maria Dalid
   Praevium Research Inc.
   Subject: Industrial Wastewater Discharge Permit Number B-373-25
   Additional 2022 Wastewater Discharge Permit Renewal Stickers were also sent to:
   - NEXT Energy Technologies, Inc.
   - Praevium Technologies, Inc.
   - Santa Barbara County South Coast Recycling and Transfer Station

6. 01/24/2022 Dennis Gutierrez
   GSE Construction Company, Inc.
   Subject: Goleta Sanitary District WWTP Influent Pump Station Rehabilitation Project

7. 01/27/2022 Roderick Britton
   Subject: Sewer Service Availability Proposed Annexation and Connection of One Single Family Residence
   A.P.N. 061-321-001 at 700 Via Tranquila, Santa Barbara, CA

Date: **Correspondence Received From:**

1. 01/14/2022 LAFCO
   Subject: 1351 Holiday Hill – Sphere & Annexation to the Goleta Sanitary District (LAFCO *No.* 22-01)

2. 01/25/2022 California Sanitation Risk Management Authority
   Subject: 2021 Annual Report

3. 01/27/2022 Air Pollution Control District, Santa Barbara County
   Subject: Authority to Construct Application 15822

4. 01/27/2022 California Water Environment Association (CWEA)
   Subject: Goleta Sanitary District Selected as one of the Finalist for the CWEA Small System-Collection System of the Year Award

5. 01/28/2022 LAFCO
   Subject: Via Maria – Annexation to the Goleta Sanitary District (LAFCO *No.* 22-02)

Hard Copies of the Correspondence are available at the District's Office for review