

AGENDA  
IRVINE RANCH WATER DISTRICT  
ENGINEERING AND OPERATIONS COMMITTEE MEETING  
MONDAY, OCTOBER 16, 2023

This meeting will be held in-person at the District’s headquarters located at 15600 Sand Canyon Avenue, Irvine, California. The meeting will also be broadcasted via Webex for those wanting to observe the meeting virtually.

To observe this meeting virtually, please join online using the link and information below:

Via Web: <https://irwd.webex.com/irwd/j.php?MTID=m6f71107fe30780b306a2e5ac3e5d1097>

Meeting Number (Access Code): 2482 657 1636

Meeting password: zj8V298ZQM (94588298 from video systems)

PLEASE NOTE: Webex observers of the meeting will be placed into the Webex lobby when the Board enters closed session. Participants who remain in the “lobby” will automatically be returned to the open session of the Board once the closed session has concluded. Observers joining the meeting while the Board is in closed session will receive a notice that the meeting has been locked. They will be able to observe the meeting once the closed session has concluded.

CALL TO ORDER 1:30 p.m.

ATTENDANCE      Committee Chair:      Doug Reinhart      \_\_\_\_\_  
                         Committee Member:      Karen McLaughlin      \_\_\_\_\_

ALSO PRESENT      Paul Cook      \_\_\_\_\_      Kevin Burton      \_\_\_\_\_      Wendy Chambers      \_\_\_\_\_  
                         Neveen Adly      \_\_\_\_\_      Paul Weghorst      \_\_\_\_\_      Steve Choi      \_\_\_\_\_  
                         Jim Colston      \_\_\_\_\_      Eric Akiyoshi      \_\_\_\_\_      Malcolm Cortez      \_\_\_\_\_  
                         Rich Mori      \_\_\_\_\_      Jacob Moeder      \_\_\_\_\_      Harry Cho      \_\_\_\_\_  
                         Alex Murphy      \_\_\_\_\_      \_\_\_\_\_      \_\_\_\_\_      \_\_\_\_\_  
                         \_\_\_\_\_      \_\_\_\_\_      \_\_\_\_\_      \_\_\_\_\_      \_\_\_\_\_

PUBLIC COMMENT NOTICE

If you wish to address the Committee on any item, please submit a request to speak via the “chat” feature available when joining the meeting virtually. Remarks are limited to three minutes per speaker on each subject. Public comments are limited to three minutes per speaker on each subject. You may also submit a public comment in advance of the meeting by emailing [comments@irwd.com](mailto:comments@irwd.com) before 9:00 a.m. on Monday, October 16, 2023.

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## COMMUNICATIONS

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1. Notes: Burton
2. Public Comments
3. Determine the need to discuss and/or take action on item(s) introduced that came to the attention of the District subsequent to the agenda being posted and determine which items may be approved without discussion.

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## ACTION

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4. IRWD WATER PIPELINES CONDITION ASSESSMENT PROJECT  
CONSULTANT SELECTION – ROBINSON / AKIYOSHI / BURTON

Recommendation: That the Board authorize a budget increase for project 12534 in the amount of \$250,000, from \$500,000 to \$750,000, and authorize the General Manager to execute a Professional Services Agreement with HDR in the amount of \$611,850 for the IRWD Capital Improvement Plan and Asset Management for Potable and Non-Potable Pipelines, Project 12534.

5. PLANNING AREA 1 ORCHARD HILLS NEIGHBORHOOD 4 DOMESTIC  
WATER IMPROVEMENTS – LEW / RIOS / AKIYOSHI / BURTON

Recommendation: That the Board authorize the General Manager to accept Irvine Community Development Company, LLC's construction contract with Shoffeitt Pipeline, Inc. in the amount of \$216,470, and authorize the addition of Project 12781 in the amount of \$382,000 to the FY 2023-24 Capital Budget for the Planning Area 1 Orchard Hills Neighborhood 4 Domestic Water Improvements.

6. ANNUAL DAM SURVEILLANCE AND MONITORING PROGRAM  
CONSULTANT SELECTION – DRAKE / MOEDER / BURTON

Recommendation: That the Board authorize the General Manager to execute a Professional Services Agreement with GEI Consultants, Inc. in the amount of \$282,911 for IRWD's Annual Dam Surveillance and Monitoring Program for three years ending 2026.

7. SECURITY SERVICES AGREEMENT – CHOI / BURTON

Recommendation: That the Board authorize the General Manager to execute a Security Services Agreement with Securitas Security Services, Inc. to provide security guard services for a three-year term ending 2026 in the amount of \$3,048,196.86 with an option for two, one-year extensions.

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**OTHER BUSINESS**

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- 8. Directors' Comments
  
- 9. Adjournment


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Availability of agenda materials: Agenda exhibits and other writings that are disclosable public records distributed to all or a majority of the members of the above-named Committee in connection with a matter subject to discussion or consideration at an open meeting of the Committee are available for public inspection in the District's office, 15600 Sand Canyon Avenue, Irvine, California ("District Office"). If such writings are distributed to members of the Committee less than 72 hours prior to the meeting, they will be available from the District Secretary of the District Office at the same time as they are distributed to Committee Members, except that if such writings are distributed one hour prior to, or during, the meeting, they will be available electronically via the Webex meeting noted. Upon request, the District will provide for written agenda materials in appropriate alternative formats, and reasonable disability-related modification or accommodation to enable individuals with disabilities to participate in and provide comments at public meetings. Please submit a request, including your name, phone number and/or email address, and a description of the modification, accommodation, or alternative format requested at least two days before the meeting. Requests should be emailed to [comments@irwd.com](mailto:comments@irwd.com). Requests made by mail must be received at least two days before the meeting. Requests will be granted whenever possible and resolved in favor of accessibility.

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October 16, 2023

Prepared by: M. Robinson / E. Akiyoshi

Submitted by: K. Burton

Approved by: Paul A. Cook 

## ENGINEERING AND OPERATIONS COMMITTEE

### IRWD WATER PIPELINES CONDITION ASSESSMENT PROJECT CONSULTANT SELECTION

#### SUMMARY:

The IRWD Water Pipelines Condition Assessment Project will use risk-based analyses to prioritize detailed condition assessments and capital replacements for potable and non-potable pipelines. Optional tasks for machine learning and project packaging are recommended to be a part of the contract. Staff recommends that the Board authorize the General Manager to execute a Professional Services Agreement with HDR in the amount of \$611,850.

#### BACKGROUND:

In 2020, IRWD initiated the Capital Improvement Plan (CIP) Asset Management Program to evaluate all linear (e.g., pipelines) and vertical (e.g., treatment plants, pump stations, and reservoirs) facilities. Previous work, completed in 2022, evaluated pump stations, lift stations, tanks, and wells. Detailed condition assessments have also been completed for high priority pump stations and concrete tanks, all steel tanks, and most groundwater production wells. The assessments proposed in this project are the next phase of the multi-phase CIP Asset Management Program and include risk-based analysis for 2,000 miles of potable pipelines and 580 miles of non-potable pipelines. This project will standardize IRWD's approach to condition assessment and capital replacement and rehabilitation for pipelines and provide a clear framework for annual updates to the process. Future phases will include risk-based analysis for sewer pipelines and treatment plants.

The scope of work for this project includes desktop condition assessments, risk-based analyses using likelihood of failure and consequence of failure scores, developing levels of service expectations, calculating pipeline remaining useful lives, and optional tasks for machine learning and project packaging. Centralized data management strategies will be used to organize, manage, and optimize the vast quantities of data that will be generated as part of this work. Data will be managed, linked, and stored in Microsoft's Azure cloud, allowing condition data to be collected and pipeline risk scores updated on a day-to-day basis. This approach aligns with IRWD's Enterprise Data Management effort and promotes IRWD ownership and repeatability for future updates, while minimizing reliance on third-party entities.

#### Consultant Selection:

Staff invited six consultants to propose on the project. Proposals were received from four consultants: Carollo, HDR, GHD, and West Yost. The proposals were evaluated, and the top two consultants, HDR and GHD, were selected for interviews and ranked as shown in Exhibit "A". While all consultants were well qualified, HDR presented a well-balanced team, a clear project approach, and excellent project understanding, as described below:

- *Project Team:* HDR is a proven leader for risk-based analysis for pressure pipelines, and recently completed successful projects for the California Department of Water Resources, City of Phoenix, and Padre Dam Municipal Water District. Its Project Manager, Dave Spencer, has extensive experience and implemented condition assessment and renewal programs for over 100,000 miles of pipelines across the country. He also has extensive experience evaluating current machine learning packages relating to pipeline condition assessments and breaks.
- *Project Understanding:* HDR’s proposal demonstrated a clear methodology for completing the work and showcased its solid project management and technical experience with risk-based analysis and detailed condition assessments for pressure pipelines.
- *Technical Approach:* HDR articulated a clear approach that uses industry standard methods for pipeline rehabilitation and condition assessment using the AWWA Manual for Condition Assessment for Water Mains (M77) to help guide the analysis.

HDR’s scope of work and fee proposal are provided as Exhibit “B”. Staff anticipates that the project will be completed in September 2024.

**FISCAL IMPACTS:**

Project 12534 is included in the FY 2023-24 Capital Budget. A budget increase as shown below is required to fund the project.

Project No.	Current Budget	Addition <Reduction>	Total Budget
12534	\$500,000	\$250,000	\$750,000

**ENVIRONMENTAL COMPLIANCE:**

This study is exempt from the California Environmental Quality Act as authorized under the California Code of Regulations, Title 14, Chapter 3, Section 15262 which provides exemption for planning studies.

**RECOMMENDATION:**

That the Board authorize a budget increase for project 12534 in the amount of \$250,000, from \$500,000 to \$750,000, and authorize the General Manager to execute a Professional Services Agreement with HDR in the amount of \$611,850 for the IRWD Capital Improvement Plan and Asset Management for Potable and Non-Potable Pipelines, Project 12534.

**LIST OF EXHIBITS:**

- Exhibit “A” – Consultant Evaluation Matrix
- Exhibit “B” – Scope of Services and Cost Estimate

CONSULTANT EVALUATION MATRIX

Capital Improvement Plan and Asset Management for Potable and Non-potable Pipelines

Item	Description	Weights	HDR	GHD	
<b>A</b>	<b><u>TECHNICAL APPROACH</u></b>	<b>60%</b>			
1	Overall Project Understanding	30%	1	2	
2	Risk Analysis (LoF, CoF, Risk Score)	20%	1	2	
3	Condition Assessment / Detailed Condition Assessment Plan	20%	1	2	
4	Data Management / Dashboards	20%	2	1	
5	Machine Learning	10%	1	2	
	<b><i>Weighted Score (Technical Approach)</i></b>	<b>100%</b>	<b>1.2</b>	<b>1.8</b>	
<b>B</b>	<b><u>QUALIFICATIONS AND EXPERIENCE</u></b>	<b>40%</b>			
1	Project Manager	40%	1	2	
2	Technical Leads	35%	2	1	
3	Team Makeup (Team Size, Cohesiveness, Experience)	25%	1	2	
	<b><i>Weighted Score (Qualifications and Experience)</i></b>	<b>100%</b>	<b>1.4</b>	<b>1.7</b>	
	<b><u>COMBINED WEIGHTED SCORE</u></b>		<b>1.3</b>	<b>1.7</b>	
	<b>Ranking of Consultants</b>				
<b>C</b>	<b><u>SCOPE OF WORK</u></b>				
TASK		Task Hours	FEE	Task Hours	FEE
1	TASK 1 - Project Management	279	\$72,670	288	\$84,120
2	TASK 2 - Review of Existing Information	124	\$32,060	178	\$41,170
3	TASK 3 - Level of Service	107	\$33,510	150	\$36,310
4	TASK 4 - Consequence of Failure (CoF / Criticality) Analysis	89	\$22,940	248	\$56,740
5	TASK 5 - Desktop Condition Assessment / Detailed Condition Assessment Plan	227	\$63,710	372	\$94,640
6	TASK 6 - Likelihood of Failure (LoF) and Remaining Useful Life Analysis	100	\$25,240	178	\$40,390
7	TASK 7 - Risk Assessment	115	\$29,490	206	\$53,710
8	TASK 8 - Replacement Costs	26	\$8,560	162	\$38,170
9	TASK 9 - Dashboards and Capital Improvement Plan and Report	420	\$108,320	492	\$124,920
	SUB-TOTAL ENGINEERING SERVICES, FEE	<b>1,487</b>	<b>\$396,500</b>	<b>2,274</b>	<b>\$570,170</b>
	Optional Tasks				
10	TASK 10 - Project Packaging and 10-Year CIP	166	\$41,640	296	\$74,940
11	Task 11 - Machine Learning Analysis	134	\$35,600	250	\$53,090
12	Task 12 - Advanced Consequences of Failure Analysis	274	\$68,910		
13	Task 13 - Additional Detailed Condition Assessment Project Plans	248	\$69,200		
	TOTAL ENGINEERING SERVICES, FEE	<b>2,309</b>	<b>\$611,850</b>	<b>2,820</b>	<b>\$698,200</b>
	Avg \$/hr		\$265		\$248
<b>D</b>	<b><u>OTHER</u></b>				
	<b>Miscellaneous Items</b>				
	Conflict of Interest		No		No
	Joint Venture		No		Yes
	Addendum Acknowledgement		N/A		N/A
	Scope of Work Exclusions		No		No
	Exceptions taken to IRWD Std. Contract		No		No
	Insurance (Professional & General Liability)		Yes, Certs Provided		Yes, Certs Provided

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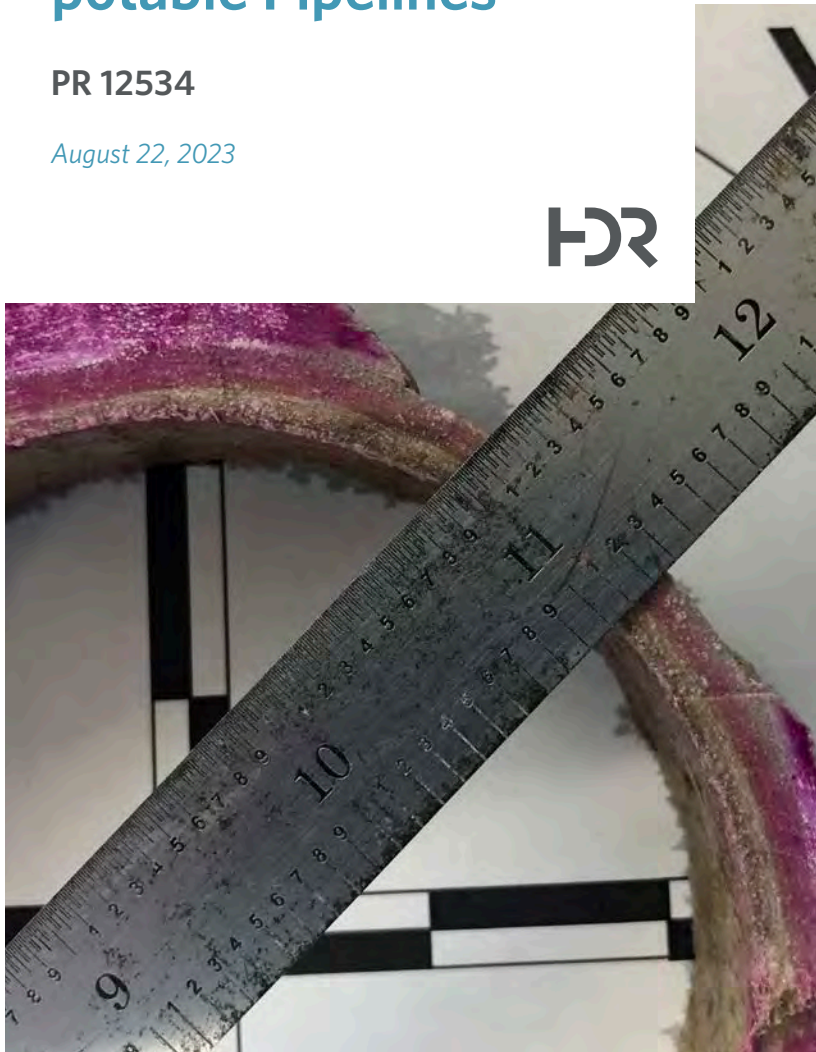
Irvine Ranch  
WATER DISTRICT

PROPOSAL

# Capital Improvement Plan and Asset Management for Potable and Non- potable Pipelines

PR 12534

*August 22, 2023*





August 22, 2023

Irvine Ranch Water District  
Mitch Robinson, PE, Project Manager  
15600 Sand Canyon Avenue  
Irvine, CA 92618

**RE: Proposal — Capital Improvement Plan and Asset Management for Potable and Non-potable Pipelines (PR 12534)**

Dear Mr. Robinson and Members of the Selection Committee,

Thank you for inviting HDR Engineering, Inc. (HDR) to propose on your Capital Improvement Plan and Asset Management for Potable and Non-potable Pipelines Project. IRWD has consistently met its mission to provide high quality water and sewer services to customers. As pipeline infrastructure ages and deteriorates, maintaining the same level of service becomes more challenging. We look forward to helping you cost-effectively maintain desired service levels. HDR is uniquely positioned to help you achieve this by providing:

**A NATIONALLY RECOGNIZED, LOCALLY BASED PROJECT MANAGER.** The foundation of our approach relies on ongoing, direct communication between IRWD Staff and our industry experts. Our Team Leader, **Dave Spencer, PE**, has implemented pipeline condition assessment and asset management programs for more than 100,000 miles of pipe around the country. He has authored four Water Research Foundation studies on the topic, including “WRF 4480: Development of an Effective Management Strategy for Asbestos Cement Pipe.” This is particularly important because asbestos cement pipe makes up almost 90% of IRWD’s pipes that are 40 years or older. Dave lives in Oceanside, less than 50 miles from your office. This allows us to regularly collaborate in-person, so we can listen to your unique challenges, share our lessons learned, and work together to define the best solutions for IRWD.

**EFFICIENT PROJECT DELIVERY.** Dave has assembled a team of experts who know your specific challenges, staff, infrastructure, and data. This knowledge, in conjunction with our experience implementing similar programs around the country, will enable us to hit the ground running and focus limited IRWD Staff time on key decisions. Our team consists of our national experts who have worked with IRWD on recent projects. For example, **Brien Clark** has supported IRWD’s corrosion protection and pipe sampling program for 17 years. **Michael Flores, Tom McCormack** and **Eric Packer** recently developed IRWD’s Pump Stations and Tanks Condition Assessment. This knowledge will reduce the level of effort from both IRWD and HDR staff while developing the pipeline program.

**PRUDENT, TRANSPARENT, AND DATA DRIVEN DECISION MAKING.** IRWD has made significant advances in recent years to collect large quantities of useful risk assessment data. **Our team specializes in leveraging that data to make prudent infrastructure management decisions that target the RIGHT pipe, at the RIGHT time, using the RIGHT technology to maximize the value of CIP investments while minimizing community impact.** HDR will partner with IRWD Staff to develop transparent decision-making processes that can be effectively communicated to key stakeholders. Our team recently performed a similar project for Padre Dam MWD, which resulted in over \$1M in savings in condition assessment, \$16M per year in pipeline replacement deferral, and a set of dashboards that enabled Staff to communicate the benefits of the program to their staff, managers, and board members.

[hdrinc.com](http://hdrinc.com)

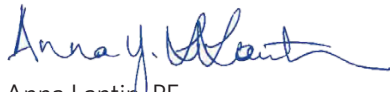
3230 El Camino Real, Suite 200, Irvine, California 92602-1377  
T 714.730.2300 F 714.730.2301

**AN IRWD-OWNED PROGRAM YOU CAN CARRY FORWARD.** Our approach will not only result in key near-term outcomes identified above, it will also **position IRWD staff to optimize how data is collected, stored, and used to refine CIP projects based on new challenges and data that emerge over time.** Similar to HDR's development of a MicroSoft Power BI Dashboard for IRWD during the Pump Stations and Tanks Condition Assessment project, this project will also result in dynamic dashboards that will support monitoring system performance and CIP execution.

HDR has been partnering with IRWD for many years bringing knowledge of your system and successful project delivery and we are excited for the opportunity to collaborate and partner with you on this project. Please contact **David Spencer** at 858.245.0771 or David.R.Spencer@hdrinc.com if you have any questions regarding our proposal.

Sincerely,

**HDR Engineering, Inc.**



Anna Lantin, PE  
*Vice President/Authorized Signatory*



David Spencer, PE  
*Project Manager*

# Executive Summary

## Partnering with you.

This project is Phase 2 in multi-year initiative to implement enhanced asset management methods, processes and tools focused on improving assessment and management of pressure pipelines. The replacement cost of IRWD’s pipelines is approximately \$7 billion. Based on actual system performance, large age based investments in pipeline replacement are not warranted. This project is focused on providing IRWD with answers to these questions and a path forward for improved assessment and replacement of pressure pipelines.

**HDR’s local team comprised of national technical leaders, including our Project Manager Dave Spencer, will greatly benefit IRWD through incorporation of lessons learned from around the country balanced with an understanding of local issues.** HDR’s team for this Project has authored over 8 books on pipeline condition assessment and rehabilitation. Having done this before and understanding the needs of IRWD, we have already identified some key challenges, how we intend to approach them, and the resulting benefit to you.

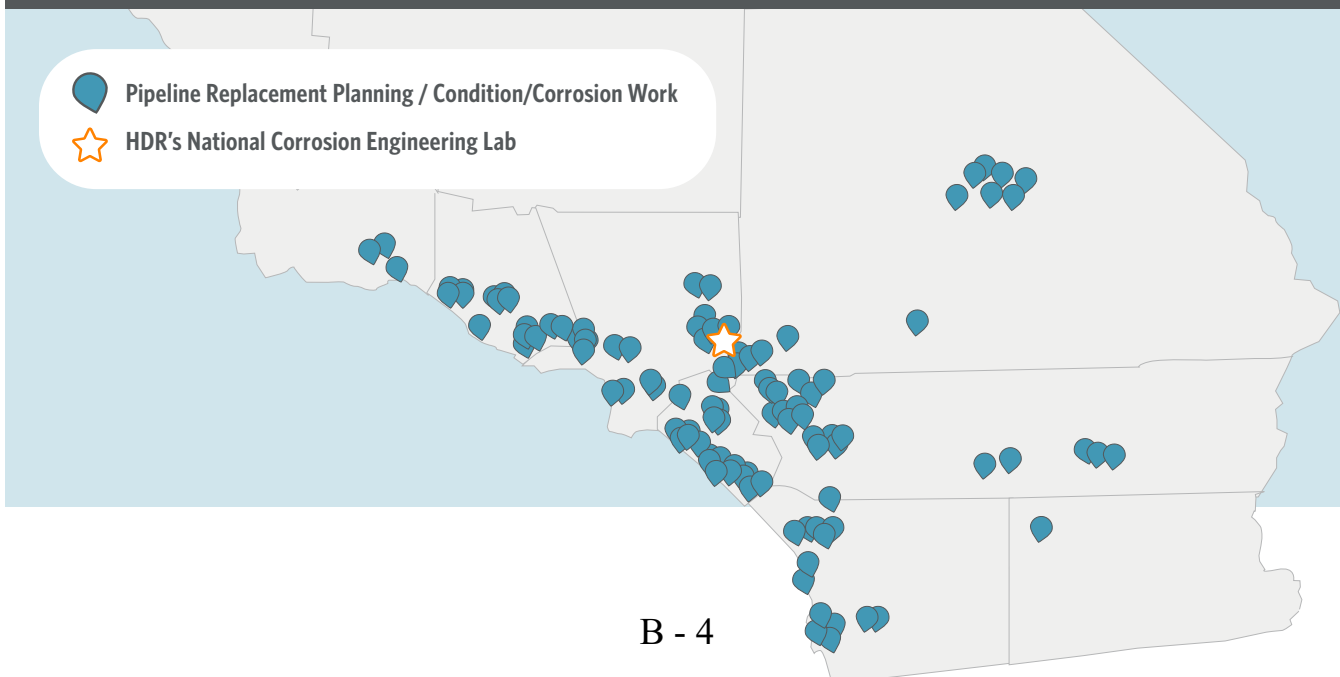
The graphic following the key challenges table demonstrates our team’s extensive industry research and experience in Condition Assessment and Corrosion projects. Our proposed project manager, Dave Spencer, has led many projects with this team and has worked hands-on with clients to deliver transparent, decision-making, and cost-saving opportunities.

### THIS PROJECT WILL HELP IRWD ANSWER THE FOLLOWING QUESTIONS:


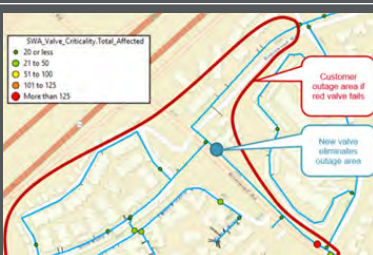
- ☑ How long will our pipes last?
- ☑ How can we optimize our resources and CIP investments (e.g. cathodic protection, leak detection, condition assessment, renewal) to cost effectively extend the life of our infrastructure?
- ☑ What service levels should we be providing?
- ☑ How much should we be investing now to maintain desired service levels in the future?
- ☑ How can we leverage the data we have to prioritize investment based on risk?
- ☑ How can we enhance the way we collect and manage data today to make sure we can efficiently leverage it tomorrow to make prudent decisions?
- ☑ What new technologies should we be leveraging to make sure we have a sustainable, staff owned program?


***The answer to these questions will establish a path forward for improved management of potable and recycled water pipelines.***

In the last ten years, HDR has performed more than **100 pipeline replacement planning, condition assessment, corrosion projects in Southern California alone.**




## We Understand Your Challenges.

RFP TASK	CHALLENGES	METHOD TO OVERCOME	BENEFIT	WE'VE DONE THIS BEFORE
1	<b>Achieving Project Schedule Goals.</b>	Leverage HDR's understanding of your data and systems to hit the ground running. During the critical first month of the project when data is being requested and reviewed, we anticipate weekly meetings to fast-start the Project to maintain project schedule.	<b>Proactive schedule management and on-time delivery</b>	 <p>This approach was used at Sweetwater Authority in developing their Water Distribution System Master Plan and contributed to delivering the project on schedule. Dave Spencer, Brien Clark and Mike Flores will leverage their experience from prior projects with IRWD on condition assessment and replacement planning for pipelines, pump stations and tanks to "fast start" project delivery.</p>
2	<b>Align recommended solutions with existing policies, practices and systems is challenging if existing data is the only input.</b>	Expand data review to include existing policies, practices, and systems related to pipeline condition and asset management from different operational group (e.g. Engineering, Operations, IT/GIS, Finance, Management)	<b>Identification of effective approaches that can be used across the system results in significant cost savings and improved decision making.</b>	 <p>For example, grouping short GIS pipes by original construction project number resulted in more effective and actionable pipe management projects that align with typical project packaging practices for the City and County of Honolulu, City of Phoenix, and Padre Dam Municipal Water District.</p>
3	<b>Evaluating and communicating Level of service targets, costs and benefits to IRWD staff and managers.</b>	Develop dynamic forecasting tools to evaluate the impact of different investment levels and associated levels of service targets for pipe failures	<b>Develop prudent and defensible CIP budgets based on the unique level of service needs of IRWD customers</b>	 <p>Investment and level of services alternatives were evaluated Suburban Water System before successfully being presented to the Utilities Commission for rate increase approvals.</p>
4 & 7	<b>Multiplication based risk approaches can over-estimate consequence of failure for decision making purposes.</b> Recently constructed large diameter pipes will always be high consequence of failure so likelihood of failure becomes more important.	Additive approaches for combining consequence of failure and likelihood of failure allow more flexibility in identifying risk. This additive approach was incorporated into AWWA M77 by HDR staff. The additive approach can also incorporate valve failure risk, a leading driver of failure cost.	<b>Risk assessments that are efficient to develop, practical in application and require less IRWD staff time to evaluate.</b>	 <p>Discovered through our CoF process, a new valve in this Omaha neighborhood would make a break 10 times less consequential.</p>
5	<b>Balancing risks, costs, and assessment accuracy in selecting inspection methods for detailed condition assessment plans.</b> No single method finds all defects and some methods work better than others. In-pipe electromagnetic scanning, for instance, can be less accurate near the joints. Also, expensive assessment will reveal little if the pipeline is in good condition.	Our team (Dave Spencer, Brien Clark, and Dan Ellison) were primary authors of AWWA Manual of Practice M77 - Condition Assessment of Water Mains. This unbiased experience will enable us to develop a detailed and cost effective condition assessment plan.	<b>The benefits should exceed the costs. 80% of the value can often be achieved at 20% of the cost, working from readily available information and resources to more sophisticated methods.</b>	 <p>Targeted assessments of 24-inch and 27-inch steel mains at Olivenhain MWD reduced condition assessment costs and saved \$4.6M through identification of repairs.</p>
6	<b>Determining remaining useful life cost effectively.</b>	Asbestos cement pipe makes up almost 90% of IRWD's pipes that are 40 years or older. In the past, utilities have used expensive and disruptive testing methods (e.g. crush, burst, tensile, and flexural testing) that require long, full-circumference pipe samples be taken. However, Water Research Foundation Project 4480 showed that these tests are not cost-effective, particularly when much less expensive and less invasive tests (e.g. energy dispersive spectroscopy, hardness, soil, and acoustic testing) provide an equal or better correlation to break performance.	<b>Using the latest industry research and strategies to cost effectively identify remaining useful life</b>	 <p>At Mesa Water District, remaining wall thickness and the age of the pipe at the time the pipe was tested was used to extrapolate remaining useful life. This award winning approach supported data driven decision making saving \$100K per year in testing costs and \$230M in replacement costs compared to the age-based analysis.</p>


RFP TASK	CHALLENGES	METHOD TO OVERCOME	BENEFIT	WE'VE DONE THIS BEFORE
9	<b>Identify cost effective replacement or remediation strategies.</b> Replacement is expensive and not always the best value.	Evaluate alternative remediation strategies such as cathodic protection retrofits per WRF 4618, pressure reduction, and rehabilitation and rehabilitation methods, per WRF 4473.	<b>Alternative remediation strategies can provide significant savings to the District.</b>	 <p>HDR recently utilized inspection data to identify rehabilitation of 4 miles of 33-inch CML&amp;C steel water main versus replacement for Eastern Municipal Water District that resulted in significant savings.</p>
9	<b>Developing dashboards for multiple operating groups and management levels.</b>	Our team has leveraged a wide variety of software solutions including machine learning, GIS-based scripts, Model Builder, Maximo and other CMMS-based solutions, business intelligence solutions, and Microsoft based solutions. Each of these solutions may be appropriate for a particular utility depending on their unique challenges and objectives. Unlike other firms, HDR does not partner with nor profit through a particular software vendor. As a result, HDR can provide independent recommendations founded in industry best practice to ensure you choose the best solution based on your unique needs. Our approach is to develop dashboard elements to support ongoing staff data updates for pipeline program management while providing additional dashboards for communicating program status to managers and board members	<b>Dashboards that meet the needs of IRWD staff, managers and board members.</b>	 <p>For IRWD's Pump Stations and Tanks program, HDR centralized data and used dashboards to answer key questions such as "What investments are needed to maintain our infrastructure?"</p>
9	<b>Communicating results to stakeholders.</b> Condition assessment results are provided in multiple formats from different vendors and often require processing for decision making and communication to non-technical stakeholders.	Combine detailed condition assessment result into a GIS map for renewal decision making and summarize results with graphics, photography, and tables for communication to non-technical stakeholders.	<b>Comprehensive improved renewal decision making on assessed pipelines and effective communication of value-added improvements to key decision makers.</b>	 <p>For the City of Phoenix, HDR developed a visual representation and "flyover" of remaining pipe wall thickness to communicate improvement needs to stakeholders.</p>
10	<b>Defensible and dynamic updates to CIP recommendations as CIP project costs fluctuate and priorities change over time.</b>	We use a data-driven methodology to develop, prioritize and optimize the CIP. Steps include define drivers and goals, quantify costs and benefits, prioritize to achieve goals, optimize project phasing within constraints and evaluate alternatives in real time. The steps are built into tools that can be used by IRWD staff over time as the CIP changes.	<b>Defensible and objective prioritization of projects so that improvements are made at the right time to extend asset lives.</b>	 <p>Balanced and prioritized CIP budgets delivered for West Basin Municipal Water District.</p>
11	<b>Determining which systems to use for risk assessment.</b>	Our approach includes a workshop within a month of NTP to share lessons learned from other utilities and decide whether IRWD will pilot machine learning. Fast-tracking the decision to implement machine learning will enable the team to focus on refining IRWD's risk assessment and project packaging processes within the desired information system.	<b>A system IRWD can own and carry forward.</b>	 <p>Dave Spencer and HDR have evaluated the efficacy of a variety of different machine learning software solutions at utilities such as the cities of Phoenix, St. Petersburg, Santa Cruz, Bellevue, and Tucson Water. This evaluation included measuring the accuracy of break predictions.</p>

# More than 20 Years of Unrivaled Technical Expertise and Leadership in Infrastructure Condition Assessment and Cathodic Protection


A timeline of your Key Expert's key publications, research, cost-savings, and contributions




**DAVID SPENCER, PE**  
 22 Years of Experience  
 Project Manager



**DAN ELLISON, PE, SE**  
 42 Years of Experience  
 QA/QC



**BRIEN CLARK, PE, NACE/AMPP CP-4**  
 22 Years of Experience  
 Corrosion Advisor



**ERIC SCHERCH, PE**  
 19 Years of Experience  
 Task Group 3 Lead  
 (Detailed Condition Assessment)

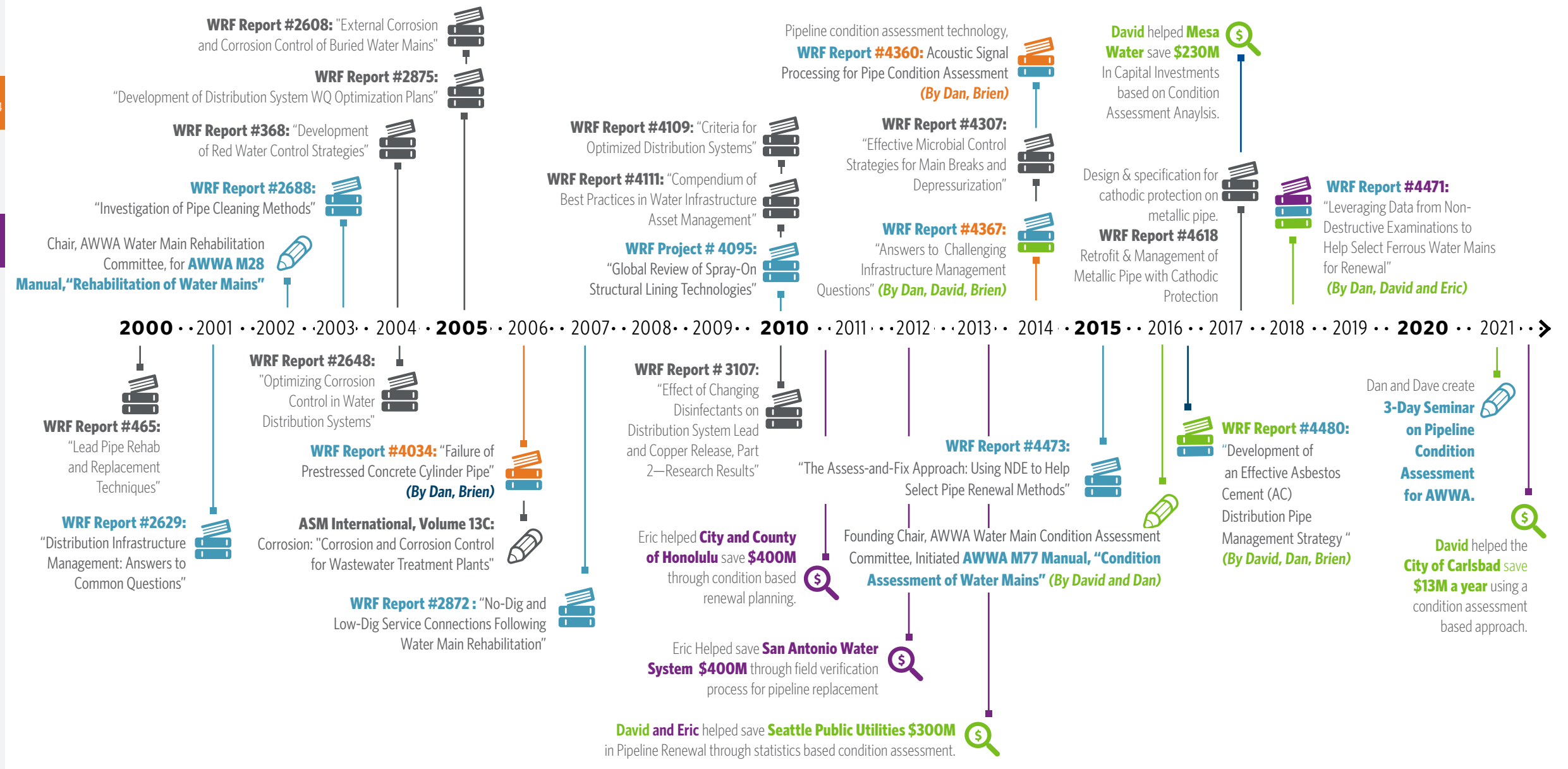
**\$1 BILLION COST-SAVINGS**  
 David and Eric have helped save utilities over \$1B in pipeline replacement through data driven condition based programs.

**8 BOOKS**  
 David and Dan is the Principal Author of eight books on the subject of assessment and rehabilitation of water infrastructure.

David has worked with over 100 utilities to develop risk based pipeline programs

**RISK ASSESSMENT OF 100+ UTILITIES**

**OVER 1,000 MILES OF PIPE ASSESSMENT**  
 David and Brien conducted over 1,000 miles of pipe condition assessment and cathodic protection.



## LEGEND

-  Cost Savings
-  Key Research and Publications
-  Author or significant contributor to broadly published industry guidance manual or published industry standard

**Note:** Icons are color-coded on timeline to attribute these accomplishments to Key Personnel mentioned above. **Grey-colored icons are attributed to HDR.**

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REQUIREMENT  
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**APPENDIX**

STAFF RESUMES  
PAGE APP-01



# A

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## Scope



SCOPE

## Project Understanding

The current replacement cost of Irvine Ranch Water District's (IRWD's) potable and recycled water main infrastructure is approximately \$7 billion dollars. As the system continues to age and deteriorate, one of IRWD's primary goals is to cost effectively sustain desired service levels through infrastructure management and replacement. An age-based pipeline renewal budget using AWWA's published useful life information<sup>1</sup> would suggest a replacement program of roughly \$70 million dollars per year over the next 30 years. This level of investment is neither reasonable nor cost-effective because age alone is a poor indicator of condition and IRWD's system is performing so well. In the industry, system-wide performance and condition is often measured in terms of "break rate", which measures the annual number of main breaks per 100 miles of pipe operated. IRWD's break rate is approximately 2 annual breaks per 100 miles. IRWD's performance is ten times better than the national average and five times better than the regional average<sup>2</sup>.

This project is Phase 2 in multi-year initiative to implement enhanced asset management methods, processes, and tools focused on improving assessment and management of pressure pipelines. Prior to 2010, recycled water produced at IRWD's Michelson WRP was much more aggressive to asbestos cement pipe, accelerating one of the primary deterioration mechanisms called calcium leaching. This issue was addressed in 2010 to reduce the rate of future deterioration, however the pipes near Michelson are likely to have elevated rates of internal degradation. **Even with the more aggressive water, IRWD's pipeline infrastructure is expected to last longer than industry averages due to good design, operational practices, management practices (e.g. leak detection), and soil characteristics which are particularly amenable to longer life.** For example, asbestos cement (AC) pipe makes up 57% of IRWD's breaks and almost 90% of IRWD's pipes that are 40 years or older. AWWA's published useful life for AC pipe ranges from 70 to 105 years. However, IRWD's AC pipe are expected to last, on average, much longer because one of the three prominent mechanisms for AC deterioration (salt cracking), is not

## THIS PROJECT WILL HELP IRWD ANSWER THE FOLLOWING QUESTIONS:

- How long will our pipes last?
- How can we optimize our resources and CIP investments (e.g. cathodic protection, leak detection, condition assessment, renewal) to cost effectively extend the life of our infrastructure?
- What service levels should we be providing?
- How much should we be investing now to maintain desired service levels in the future?
- How can we leverage the data we have to prioritize investment based on risk?
- How can we enhance the way we collect and manage data today to make sure we can efficiently leverage it tomorrow to make prudent decisions?
- What new technologies should we be leveraging to make sure we have a sustainable, staff owned program?

*The answer to these questions will establish a path forward for improved management of potable and recycled water pipelines.*



<sup>1</sup>The age based renewal budget applies District infrastructure installation years and unit costs to published useful life estimates from the America Water Works Association (AWWA) report titled Buried No Longer: Confronting America's Water Infrastructure Challenge to determine the average replacement cost over the next 50 years.

<sup>2</sup> Per Folkman's 2018 report titled Water Main Break Rates in the USA and Canada: A Comprehensive Study based on Region 2 which includes California, Hawaii, and Nevada.

prevalent. Salt cracking occurs where salts migrate into the pipe wall through capillary and evaporation processes and then crystallized and expand when hydrated. Figure 1 shows the San Antonio service area (on the left) and IRWD’s service area (on the right) with salt concentration levels shown on a red (high salt content) to green (low salt content) scale. IRWD’s AC pipe is exposed to much lower levels of salts and as a result, even though the average age of AC pipes in both systems is similar, IRWD’s AC break rate is roughly 20 times better and will have a much longer average useful life than AC pipes in San Antonio.

**IRWD’s soils are amenable to longer life for AC pipes.** As a result, industry useful life estimates and the resulting age-based investments levels (\$70M/yr) are not appropriate for IRWD.



**THE PRIMARY OBJECTIVES OF THIS PROJECT INCLUDE:**

- + **Develop a prioritized, risk-based list of CIP pipeline projects** which is anticipated to include investments in pipeline condition assessment, cathodic protection, and renewal.
- + **Enhance IRWD’s existing data management, analysis, and decision-making processes** providing a clear framework for IRWD to update the results as new data becomes available.
- + **Position IRWD staff to quantify performance, monitor program execution, and visualize and communicate the program** to internal and external stakeholders through clear, spatially enabled dashboards.

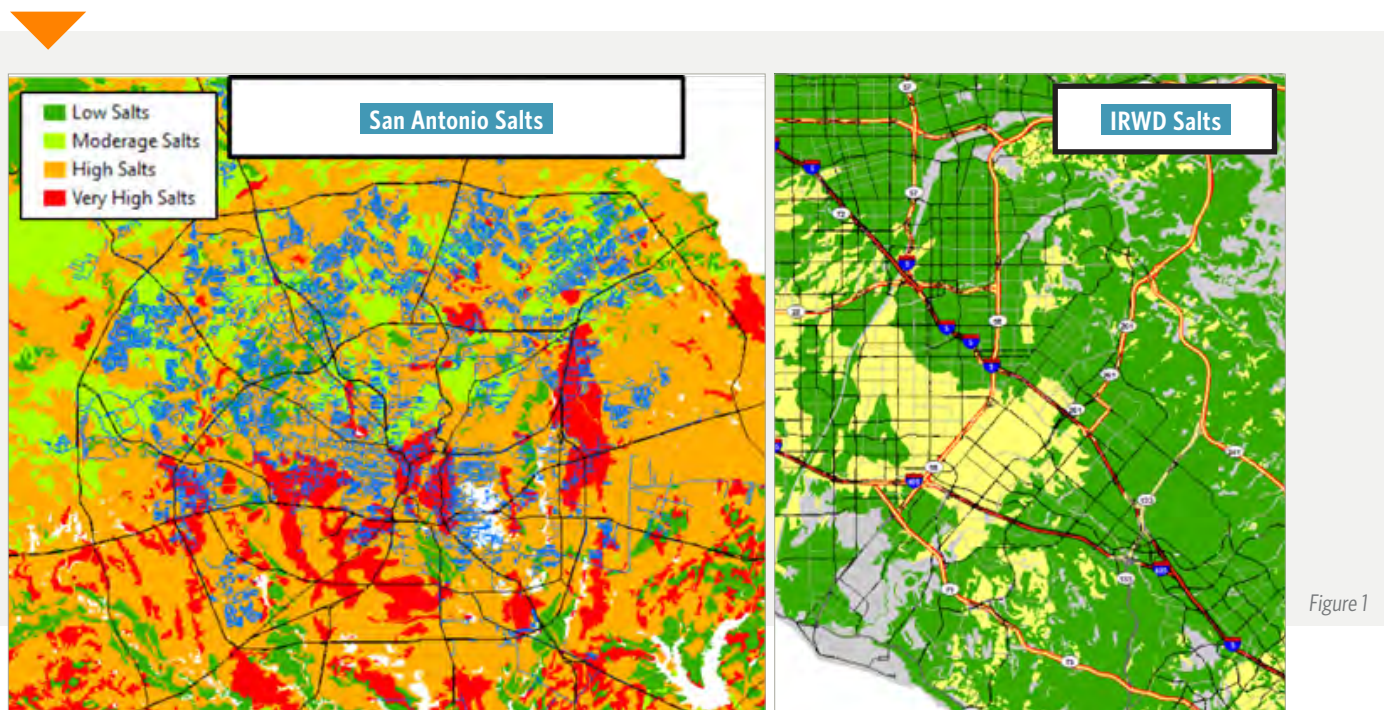


Figure 1



## Project Approach

The purpose of this study is to develop a condition-based CIP and asset management program that will enable IRWD to cost-effectively sustain desired levels of service. IRWD has a wealth of data to support this objective including GIS, breaks, cathodic test station (CTS) readings, leak detection, and some direct condition assessment data. **Now is the time to pivot toward leveraging this data to drive prudent budgeting and decision making.**

To accomplish this, we have organized our team around five task groups (Figure 2) which include all of the tasks within the RFP. Each Task Group contains interrelated RFP tasks that require close coordination for effective execution and were therefore grouped together under a single Task Lead.

A primary challenge for asset management programs is converting a large volume of data into clear, meaningful insight. To address this, optimization of data management practices and dashboard development will be a central component engrained in all tasks. This will empower IRWD staff to efficiently and continuously collect and leverage data to make good decisions. The dashboards will serve as a quick way to access data developed through the project, including condition scores, consequence scores and risk scores, and well as individual pipe recommendations and replacement cost from an interactive map-based platform. The capital planning recommendation will be presented visually as well, to relate annual pipe replacement costs based on selected level-of-service strategies.

**Data management and dashboarding will be important for all tasks. Look for this icon throughout our approach for examples.**

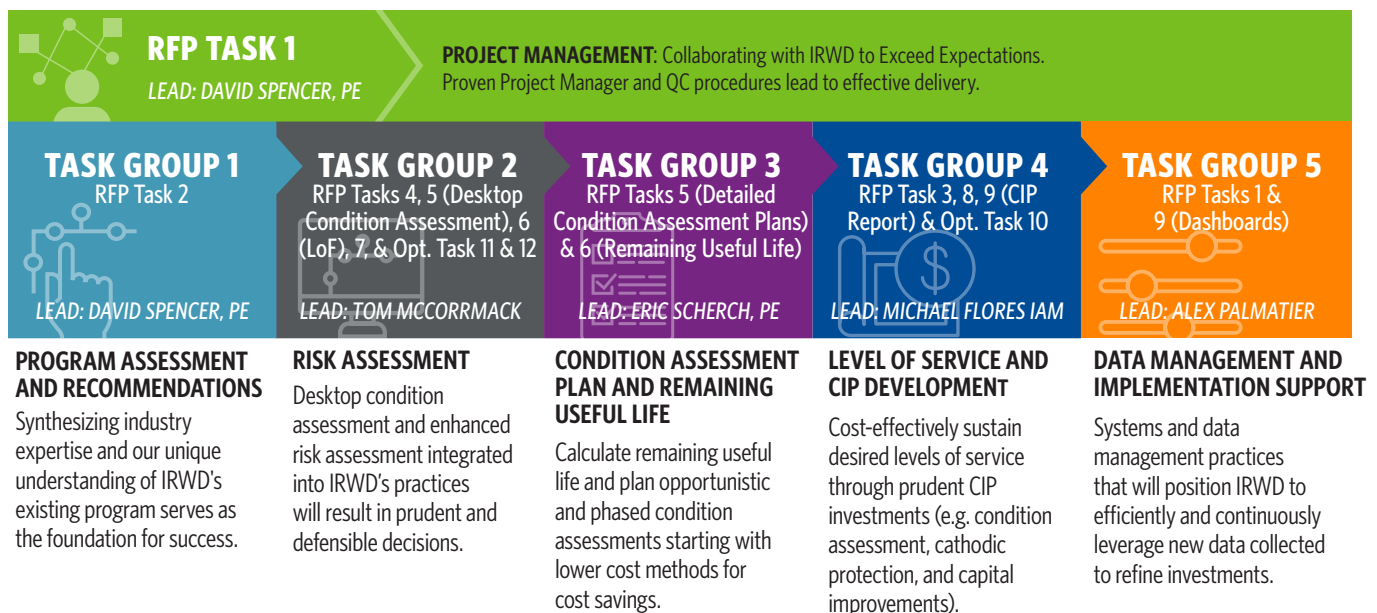


Figure 2



## RFP Task 1 Project Management: Collaborating with IRWD to Exceed Expectations

IRWD deserves a well-managed Project that includes frequent communication between IRWD staff and the HDR team, which meets the schedule and stays within the approved budget. The following outlines our approach to managing your project to a successful conclusion.

### JOB SET-UP & PROJECT MANAGEMENT PLAN

HDR’s internal job set-up will be completed upon receipt of IRWD’s NTP. As part of initial job set-up and in accordance with HDR standards, we will prepare a Project Management Plan (PMP). The PMP guides the project throughout its life to provide effective management of work and delivery.

**COMMUNICATION** will be largely driven by our Project Manager David Spencer to and from IRWD. We will define more detailed communication delegation and other protocols at the project kickoff meeting. We will rely heavily on email for informal communications, but we will contact you by phone or meet in person, as more efficient discussions are required.

**REGULAR MEETINGS** with IRWD will be the cornerstone of formal project interaction, which falls in line with our proposed progress informal meetings. David Spencer would like to schedule bi-weekly meetings with Mitch Robinson, IRWD’s Project Manager, to keep information flowing and to monitor our project risk register that we will include as part of our project management approach. It is anticipated these meetings will last no longer than 30-minutes, but will allow a free flow discussion on key items needing attention. HDR will also lead workshops at each major milestone, as requested in your RFP. This will not only inform the District of project progress but help expedite IRWD’s review of submittals.



Johnson County Wastewater

**COST CONTROL** is critical to delivering the scope of work for the approved budget. Project costs are monitored using business intelligence tools to provide a vivid picture of accomplishments, work in progress, milestones and future activities. Weekly project cost reports are generated internally from our Electronic Business System accounting based on actual timesheet charges by project staff. They will also be reviewed by David to assess current budget status. Our invoicing will include a project progress report outlining percent complete by task.

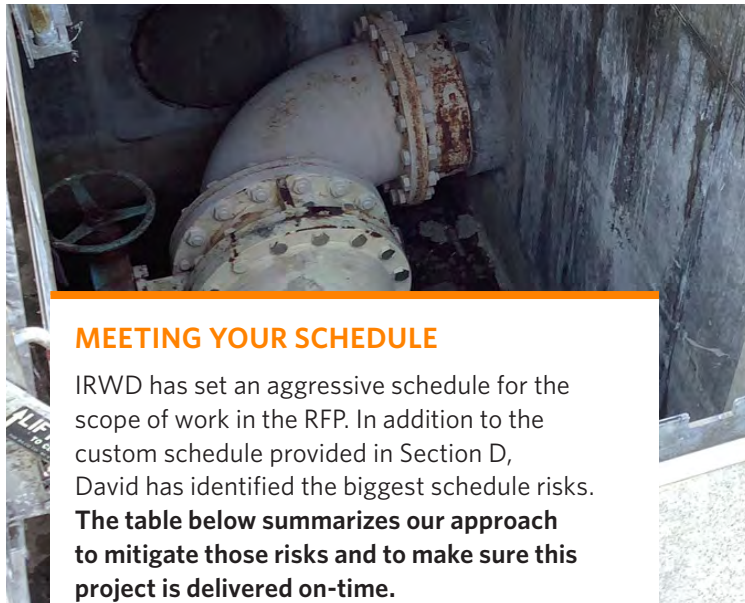
**SCHEDULE CONTROL** is critical to delivering the scope of work to meet the set project deadline. Project progression is monitored over multiple time frames to track percent complete along with remaining budget. The aggressive schedule set forth will require us to focus on not only delivering quality but meeting the schedule.

We’ve provided a custom schedule in Section D that identifies key deliverable dates along with key workshops and meetings with IRWD that is further outlined in our schedule approach.

**QUALITY** begins with a mindset shared by all members of our team. It starts by clearly understanding your expectations and making a commitment to meeting them every time. At the start of the project, HDR will prepare a four-part Quality Management Plan to provide seamless coordination, communication, and project execution. This document becomes a valuable reference guide for the entire team, including you, whether you want to contact someone on the team, identify milestones or review the budget, this document keeps the team focused on the project and meeting the expectations of IRWD staff.

*Wow! The work Dave Spencer and the team are doing is incredible and so very important to Johnson County’s forward progress. Thank you for continuing to fulfill our vision!”*

- Susan D. Pekarek, General Manager,  
 Johnson County



### MEETING YOUR SCHEDULE

IRWD has set an aggressive schedule for the scope of work in the RFP. In addition to the custom schedule provided in Section D, David has identified the biggest schedule risks. **The table below summarizes our approach to mitigate those risks and to make sure this project is delivered on-time.**

### RFP TASK 1 PROJECT MANAGEMENT

**Objective:** IRWD deserves a well-managed Project that includes frequent communication between IRWD staff and the HDR team, which meets the schedule and stays within the approved budget.

**Deliverables:**

- Kickoff Meeting Agenda and Minutes
- Project Management Plan
- Project Action Item Tracking Log
- Project Decision Tracking Log
- Workshop Agendas and Minutes

**Assumptions for All Tasks:**

- All deliverables will be electronic (no hardcopies).
- IRWD staff will participate in all workshops and interviews.
- IRWD will consolidate comments from individual reviewers into a single set of comments for HDR to review and incorporate. Comments from IRWD will be received within 2 weeks of submittal to City.

SCHEDULE RISK	APPROACH AND BENEFIT
UNDERSTANDING YOUR DATA	IRWD’s proposal provided many of the key data sources that will drive decision making. HDR has thoroughly reviewed these data sources to make sure we can hit the ground running and will leverage our institutional knowledge of IRWD data. <b>Brien Clark has over 17 years of experience working with the District’s pipeline and corrosion data.</b>
LACK OF UNDERSTANDING OF YOUR GOALS AND PROCESSES	Expansion of the Review of Existing Information task to not only include your data, but also your existing policies, practices, and systems. This will make sure work considers that framework and potential optimization points. <b>Michael Flores, Tom McCormack and Eric Packer recently developed IRWD’s Pump Stations and Tanks Condition Assessment. This knowledge will reduce the level of effort from both IRWD and HDR staff while developing the pipeline program.</b>
EFFICIENT COMMUNICATION	HDR’s local team of industry experts allow us to meet face to face, with lessons learned from around the country, to efficiently make decisions and move forward. <b>HDR’s experts including Dave Spencer, Mike Flores, Eric Scherch, Dan Ellison, and Brien Clark are all located in Southern California.</b>
DETERMINE WHICH SYSTEMS TO USE	Our approach includes a workshop within a month of NTP to share lessons learned from other utilities and decide whether IRWD will pilot machine learning. Fast-tracking the decision to implement machine learning will enable the team to focus on refining IRWD’s risk assessment and project packaging processes within the desired information system. <b>Making this decision early in the project will allow the team to focus on the desired implementation approach. Dave Spencer has utilized this approach successfully with other utilities including Padre Dam MWD, Suburban Water Systems, Phoenix and Tucson.</b>
COMMUNICATION FREQUENCY	We anticipate scheduling bi-weekly coordination meeting with the IRWD PM to make sure that issues are quickly identified and resolved. During the critical first month of the project when data is being requested and reviewed, <b>we anticipate weekly meetings to fast-start the Project to maintain project schedule. This approach was used at Sweetwater Authority in developing their Water Distribution System Master Plan and contributed to delivering the project on schedule.</b>
UNDERSTANDING IRWD’S KEY SCHEDULE CONSTRAINTS	During the kickoff meeting, we will identify which deliverables are particularly sensitive to the schedule. For example, if it is important to <b>develop budgets by a particular date so they can be integrated during budget season, we will refine the schedule to deliver those tasks first. This approach was used successfully at Rancho Water District</b> to provide budgets for valve asset management work. Rancho Water District’s budgeting deadline was shortly after Dave received NTP. Therefore, we accelerated the budgeting and level of service task to make sure data driven budgets could be used.



## Task Group 1 Program Assessment and Recommendations

The “right” solution for one utility may not be appropriate for another utility. This task will allow us to listen to your unique challenges and operating context so we can share pertinent lessons learned and potential solutions – that you can own and carry forward. Task Group 1 includes an assessment of IRWD’s existing pipeline condition assessment, data management, asset management, CIP development, and information systems and a prioritized list of actionable recommendations for improvements. **HDR’s proposed project manager, David Spencer, has developed over 100 water pipeline asset management and CIP programs around the country and has performed direct assessment on some of IRWD’s AC pipes.** This knowledge will minimize the learning curve and enable the HDR team to hit the ground running. The foundation of our approach relies on ongoing, direct communication with IRWD staff while engaging our industry experts at appropriate stages. This task will begin with a review of existing data, practices, and systems and interviews with key staff. Together through a series of analyses and workshops, we will review and refine IRWD’s existing data management practices, workflow, and information systems based on industry best practices and the unique needs of your program.

Our Team’s Hand’s-On Knowledge of industry best practices and IRWD’s program will reduce the level of effort from both IRWD and HDR staff during project execution.

### EXAMPLES OF OUR KNOWLEDGE OF IRWD PRACTICES INCLUDE:

- + Analysis of IRWD’s AC Coupons  
 DAVE SPENCER  
 BRIEN CLARK
- + Condition Assessment & Asset Replacement Plan for Pump Stations and Tanks  
 MIKE FLORES
- + Corrosion Control  
 BRIEN CLARK
- + Condition Assessment Training for IRWD Staff  
 DAVE SPENCER  
 MICHAEL FLORES  
 DAN ELLISON  
 ERIC SCHERCH



The foundation of our approach relies on efficient communication between our team and your staff. In the picture below, David Spencer and Dan Ellison have highlighted specific areas of risk maps for efficient review by Padre Dam Municipal Water District staff.

Our proven approach applied at over 100 utilities around the country has been tailored to your needs to position you for success.



**LISTEN**  
 to your unique experiences and challenges



**DOCUMENT**  
 your programs, policies, workflow, readily available data, data gaps, and perceived drivers for deterioration and renewal



**SHARE**  
 our experience, lessons learned, and potential solutions



For example, in IRWD’s GIS, the average pipe length is 92 feet. However, effective and actionable pipe-management projects (e.g. condition assessment, cathodic protection, replacement) require much longer pipe lengths to be cost-effective and avoid repeated customer disruptions in a single neighborhood.

**To address this issue, we suggest that GIS pipes be grouped (through an attribute in GIS) to obtain more useful results.**

Methods for grouping may include by contiguous attribute (e.g. diameter, material, installation year), valve to valve, original construction project, or a combination of these methods. In particular, IRWD should consider leveraging the original construction project (i.e. As-Built Number) which is a populated on over 98% of the system by length in GIS. Industry research has shown a strong correlation between original construction project and pipeline performance and condition. In theory, this is because of varying manufacturing, transport, and installation quality from project to project. For example, Figure 3 shows PVC pipes that were installed in the 1980s in a neighborhood of Honolulu, HI. Distinct colors show distinct original construction projects. The location of main breaks (red stars) are concentrated in two original construction projects (yellow and pink) while the rest of the PVC pipes in the area are performing well. Leveraging IRWD readily available construction project data will avoid risk maps that look like confetti and result in more practical and actionable risk mitigation projects.

While IRWD has large volumes of useful data, we anticipate some targeted data cleansing will be required to meet the objective of this project. The key to success for any data cleansing activity is have a firm understanding of the value and level of effort to close each data gap and strategically focusing resources on those gaps that will drive decision making. For example, IRWD has collected a wealth of high value cathodic test station (CTS) readings. For pipe with cathodic protection, these readings quantify how well the pipe is protected and any emerging issues that need to be addressed to cost-effectively extend infrastructure life. For pipe that have CTS and do not have cathodic protection (unprotected pipe), trending this CTS data can be a valuable data source to identify areas of the pipe that are corroding and identify appropriate mitigation steps such as spot repairs or more thorough but expensive condition assessment. Historically, IRWD



Figure 3

**Grouping short GIS pipes by original construction project number will support effective and actionable pipe-management projects.**



Brien Clark’s deep understanding of IRWD’s historic cathodic protection infrastructure, procedures, and data through his work with IRWD over the past 17 years will **position our team to efficiently leverage that data to drive prudent decisions.**



has used three different naming conventions to document readings. However, the current standard has been in place for roughly five years. From a data perspective, the best solution would be to align three naming conventions so all of the data could be used for trending and decision making. However, this would require a significant level of effort and there is a diminishing return on investment as this data gets older and many newer data points are available.

**A prudent course of action may be to document how this older data can be leveraged manually in rare troubleshooting cases where using older data is important and focus limited data cleansing resources on higher value tasks such as associating each CTS in GIS to the pipe it is connected to which is critical to efficient and effective use of data currently being collected.**

#### RFP TASK 2 REVIEW OF EXISTING INFORMATION

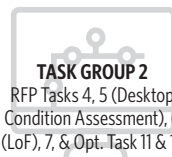
**Objective:** Review and refine IRWD's existing data management practices, workflow, and information systems based on industry best practices and the unique needs of your program.

**Deliverables:**

- Initial Data Request
- Meeting Minutes
- Work to be documented as a Chapter in the Draft and Final Pipeline Management Technical Memorandum

**Assumptions:**

- IRWD will provide requested data within three (3) weeks of initial request.
- IRWD staff will assist in scheduling assessment interviews.



### Task Group 2 Risk Assessment

As IRWD's system continues to age and deteriorate, development of a staff-owned risk model will serve as the foundation for identifying and prioritizing prudent CIP investments (e.g. condition assessment, cathodic protection, and replacement) to cost-effectively sustain desired levels of service. To accomplish this, HDR will develop a risk model incorporating likelihood of failure (LoF), consequence of failure (CoF) and other factors<sup>3</sup> that may accelerate a particular project.

IRWD has a wealth of data to quantify LoF including GIS, breaks, cathodic test station (CTS) readings, leak detection, and pipe coupon data.

**A key aspect of the project will be developing the data architecture to connect data across IRWD enterprise systems. HDR will link pipeline break data from Maximo to IRWD's GIS Geodatabases to gain insight into historical break rates by pipe material, size, type, and season. HDR will develop dashboards providing map-based data visualization to capture these trends in order to support initial analysis.**

#### DESKTOP CONDITION ASSESSMENT TO DETERMINE LIKELIHOOD OF FAILURE

HDR will leverage existing IRWD data to perform a desktop condition assessment (Task 5 of the RFP) to support LoF determination. IRWD break data is one data set HDR will leverage. Since IRWD has experienced a relatively small number of breaks to correlate against, IRWD institutional data and HDR industry knowledge and data will be required to develop the risk model.



<sup>3</sup>These factors may include inoperable valves, LCRR investments, service breaks, water quality issues, hydraulic capacity constraints and planned street restoration or other construction work.

HDR has experience integrating institutional data and industry data. For example, industry data such as the data presented in Figure 4 could be used to develop risk model factors in the absence of failure data. In this example, HDR used historic break data to identify that increased ground movement and pressure changes accelerate deterioration in AC pipe and should be weighted in the risk model at 8% and 5% respectively. This data correlates well with the performance of other AC pipe in the USA and findings in Water Research Foundation Study 4480 "Effective Management of AC Pipe".

IRWD has made significant investments in leak detection including collecting almost 2,000,000 unique readings in the past seven years. This includes broad coverage over most of the potable and recycled water distribution system and many reading in areas prone to elevated breaks. This means that the vast majority of

**Analysis of IRWD's historic leak detection data will support unplanned break avoidance, CIP prioritization, and optimization of the leak detection program.**



**At Contra Costa WD, HDR found that pipes exposed to high pressure and installed in high shrink swell soils had a shorter useful life than other pipes. We will use IRWD's existing data to quantify similar relationships and develop a transparent and data driven risk model which assures ratepayer realize the most return of their investment.**

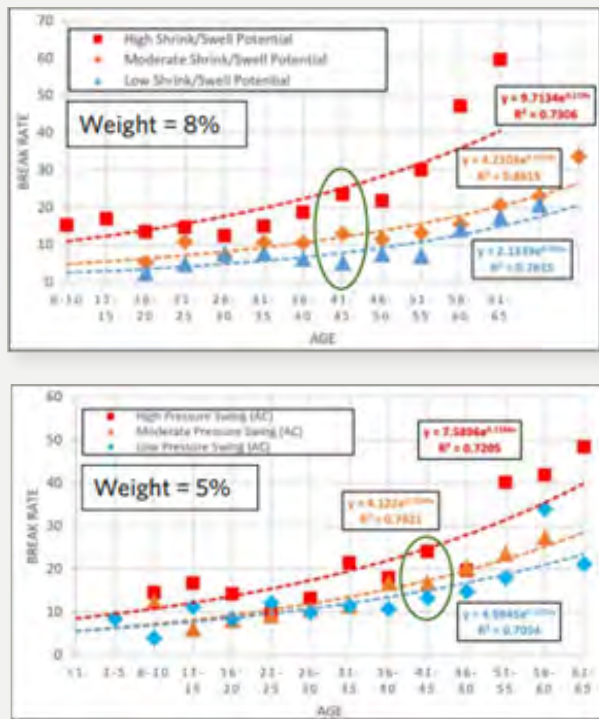


Figure 4

recent and future breaks will have leak detection records prior to the break.

**Analyzing this data will position IRWD to better understand the relationship between leaks and future breaks and answer key questions such as:**

- On average, how long can we hear a leak before it turns into a break?
- Are there particular pipe characteristics (e.g. diameter, material, pressure) that impact the duration between an audible leak and a break?
- Are there other characteristics that impact IRWD's ability to hear small leaks (e.g. roadway noise, crew lead)?
- Are past leaks a good indicator of future leaks and breaks?
- Are there ways to enhance leak detection crew training?

The answers to the above questions will inform recommendations on improving data collection and use of leak data for that allow staff to update the condition of each pipeline. The results of this desktop condition assessment will be an important input into LoF for the risk assessment. The desktop condition assessment will be used to inform the inform recommendations for data management and use.

### QUANTIFICATION OF CONSEQUENCE OF FAILURE

CoF is another important factor in risk assessment. This may include readily available traditional factors such as roadway type, diameter, pressure, slope, material ductility and proximity to environmentally sensitive areas. We recommend augmenting this (as part of Optional Task 12) with more advanced metrics that account for how many customers are put out of service and the importance of each customer (i.e., loss of service to a single-family home versus loss of service to a hospital) if a failure occurs. This is accomplished by using non-proprietary tools developed by HDR to run IRWD's existing hydraulic model one time for each pipe and valve in the system. We assume it has failed for a specified outage duration then measure the number of valves required to isolate the break, the critical customers out of service, the total customers out of service, and the flow not delivered. This provides a more accurate measurement of the impact of a break and can also be used to identify locations in the system where resiliency could be dramatically improved if a valve was added to leverage existing pipe looping. **By automating this process, IRWD can feel confident that weak points and consequential assets in the system will be identified and prioritized.**




**Discovered through our CoF process, a new valve in this Omaha neighborhood would make a break 10 times less consequential.**

### HOLISTIC RISK ASSESSMENT


Traditionally, the water industry has calculated risk as the product of LoF and CoF. However, utilities and AWWA Manual M77 - Condition Assessment of Water Mains have recognized the added value and flexibility that can be achieved by using a weighted summation. This includes adjusting weights when making different types of decisions and accounting for other factors that do not directly impact the risk of main failure but may influence whether the IRWD accelerates or decelerates a particular pipe renewal. These factors may include inoperable valves, LCRR investments, service breaks, water quality issues, hydraulic capacity constraints and planned street restoration or other construction work. In this way, the result of the risk model can consider all readily available factors relevant to pipeline risk assessment and provide a more efficient and data-driven approach to identify and prioritize CIP projects.

**Asset management is by nature a data management challenge. HDR will leverage the latest available technology to provide IRWD with powerful cloud-based tools to access and dissect all aspects of the data and metrics developed through the project. These tools will provide IRWD with the information needed to feed data-driven asset management decisions.**


**Hydraulic Model**



**HDR's Consequence Tool**



**Measure Consequence**



**Leveraging Anchorage's existing hydraulic model enables us to efficiently measure the CoF of each asset in the system.**

#### RFP TASK 4 CONSEQUENCE OF FAILURE ANALYSIS

**Objective:** Leverage readily available data to assess pipe consequence and enhance CIP decision making.

**Deliverables:**

- Meeting Minutes
- CoF Dashboard & Data Management Strategy
- GIS Results of Analysis
- Work to be documented as a Chapter in the Draft and Final Pipeline Management Technical Memorandum

#### RFP TASK 5 DESKTOP CONDITION ASSESSMENT

**Objective:** Leverage readily available data to assess pipeline condition.

**Deliverables:**

- Desktop Condition Dashboard & Data Management Strategy
- Detailed Condition Assessment Plan Dashboard & Data Management Strategy
- GIS Results of Analysis
- Work to be documented as a Chapter in the Draft and Final Pipeline Management Technical Memorandum

#### RFP TASK 6 LIKELIHOOD OF FAILURE (LoF)

**Objective:** Estimate LoF to validate long-term CIP budgeting and inform risk assessment results.

**Deliverables:**

- Meeting Minutes
- LoF Dashboards & Data Management Strategy
- GIS Results of Analysis
- Work to be documented as a Chapter in the Draft and Final Pipeline Management Technical Memorandum

#### RFP TASK 7 RISK ASSESSMENT

**Objective:** Develop a prudent and transparent methodology to prioritize CIP projects and maximize the return on future investments.

**Deliverables:**

- Meeting Minutes
- Risk Assessment Dashboard & Data Management Strategy
- Work to be documented as a Chapter in the Draft and Final Pipeline Management Technical Memorandum
- GIS Results of Analysis

**Assumptions:**

- HDR will not be required to provide any system integration services (i.e. integration of the risk model to IRWD's CMMS).

#### OPTIONAL TASK 11 MACHINE LEARNING ANALYSIS

**Objective:** Evaluate the efficacy of two machine learning software to support the prioritization of distribution system investments. Provide vendors with the GIS and break history in the format specified by the vendors. Three years of break data will be withheld and will serve as the basis to validate the efficacy of the result.

Facilitate planning meeting with IRWD to make key pilot decisions including the basis of assets to be evaluated, the exact amount of break history to withhold for validation, and the method for independent results validation. Coordinate with and manage vendors and will perform an independent review of the efficacy of the vendor result. Document work conducted in this task as a chapter in the Draft Pipeline Management Technical Memorandum (TM). Facilitate a workshop to review the results and elicit feedback. Incorporate IRWD comments into the Final Pipeline Management Technical Memorandum (TM).

**Deliverables:**

- Meeting Minutes
- Work to be documented as a Chapter in the Draft and Final Pipeline Management Technical Memorandum

**Assumptions:**

- Vendor costs are not included.

#### OPTIONAL TASK 12 ADVANCED CONSEQUENCE OF FAILURE ANALYSIS

**Objective:** Enhance the way the IRWD estimates Consequence of Failure (CoF) identifying and prioritizing distribution system replacement projects. Leverage IRWD's existing hydraulic model to support the quantification of the CoF factors by using the model to measure the impact of a pipe failure. Completed using an automated routine that 'breaks' every pipe and valve in the entire distribution system hydraulic model to determine the estimated hydraulic impact of that event. Estimated impact will be based on: the number of customers out of service, the volume of water not delivered, valves required to isolate a break, length of pipe isolated, and the identification of how many critical customers are placed out of service. Identification of existing valve CoF, the analysis will also be used to identify where new valve installation would significantly increase the resiliency of the system.

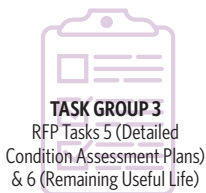
Document work conducted in this task as a chapter in the Draft Pipeline Management Technical Memorandum (TM). Facilitate a workshop to review the results and elicit feedback. Incorporate IRWD comments into the Final Pipeline Management Technical Memorandum (TM).

**Deliverables:**

- Work to be documented as a Chapter in the Draft and Final Pipeline Management Technical Memorandum
- GIS Based Results of the CoF Assessment Analysis

**Assumptions:**

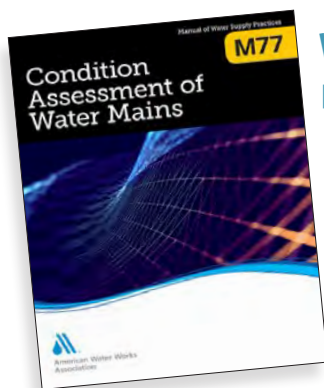
- IRWD will provide HDR with the latest distribution system hydraulic model. Hydraulic model provided will be representative of the system, accurate and adequate for consequence of failure analysis.
- IRWD will provide geo-referenced customer information and support the identification of critical customers.
- HDR will complete one (1) primary model run for the COF analysis, and one (1) updated model run after review of initial model run results by IRWD.



### Task Group 3 Detailed Condition Assessment Plans & Remaining Useful Life

Pipeline condition assessment can range significantly in cost and in the amount of data collected to support decision making. HDR's technical experts are industry leaders in applying pipeline condition assessment methods and technologies to water pressure pipes to balance cost, risk and benefits of condition assessments.

Several of our staff, including **Dan Ellison and Dave Spencer, were lead authors and major contributors to the AWWA Manual of Practice M77 - Condition Assessment of Water Mains**, which is the guidebook for our industry on everything from desktop evaluations to planning and executing field inspections to analyzing and interpreting inspection data to make prudent, actionable plans for prolonging the service lives of mains. We are also unbiased as it relates to the various technologies; we bring forward the right technology for the situation. Our program's key to success will be combining our industry expertise with IRWD's institutional knowledge.



**We wrote the book on pressure pipeline condition assessment! Dan Ellison and Dave Spencer are lead authors on several pipeline condition assessment books including AWWA Manual of Practice M77 - Condition Assessment of Water Mains.**

Desktop Condition Assessment will be performed with the LoF risk assessment and results will inform pipeline selection for condition assessment and condition assessment methods selected for each type of pipe.

**The Detailed Condition Assessment Plan task will include developing the following two plans:**

- Detailed Condition Assessment - Assessment Plans - includes actionable plans, budget and schedule for specific pipeline assessments
- Opportunistic Condition Assessment Plan - includes recommendations, procedures, budget and schedule for opportunistic pipeline assessments.

### OPPORTUNISTIC CONDITION ASSESSMENT

While some proactive condition assessment will be warranted in order to identify pipelines for replacement prior to pipelines experiencing breaks, significant savings could be realized by expanding IRWD's existing opportunistic assessment program. Opportunistic assessments are done when the pipe is already exposed for another reason (valve replacement, new service installation, etc.), thereby taking advantage of the pipe exposure. Methods for opportunistic assessment vary by material.

**The key to success of these programs is proper training and efficient data collection to make certain these assessments don't impact efficiency nor the ability of IRWD to restore service as quickly as possible.**



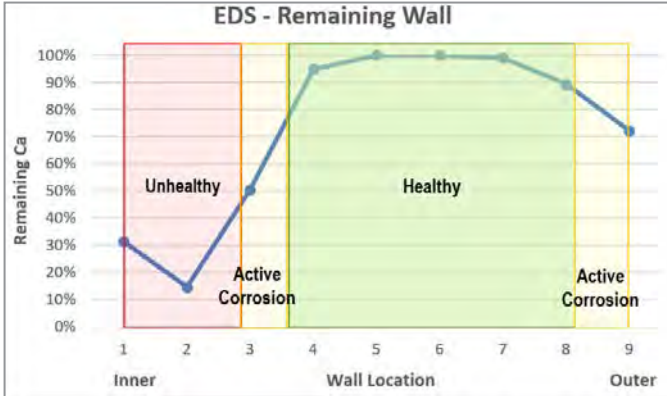
Since AC pipe makes up almost 90% of IRWD's pipes that are 40 years or older, special attention will be focused on this pipe material. Our project manager, Dave Spencer, has co-authored four Water Research Foundation studies, including the most recent book on condition assessment of AC pipe titled "WRF Project 4480: Development of an Effective Management Strategy for Asbestos Cement Pipe." Our proposed technical approach is based upon the practical application of this research and is summarized on the following page.



**David Spencer helped train Rancho California Water District crews to perform opportunistic testing when a pipe is exposed — saving the District hundreds of thousands of dollars per year in more expensive and disruptive planned assessment.**



In order to develop a cost-effective condition assessment program, it is important to understand the most likely causes of deterioration in the Systems as each mechanism requires a different condition assessment method. Exhibit 1 describes each mechanism for AC pipe, how it is measured, anticipated prevalence of the mechanism in your Systems, and our initial recommendation for testing.

MECHANISM	MEASUREMENT METHOD	ANTICIPATED IMPACT TO SYSTEM FOR IRWD	TESTING RECOMMENDATION
<p><b>SALT-CRACKING &amp; SULFATE ATTACK</b></p> <p>Salt-cracking occurs where salts migrate into the pipe wall through capillary and evaporation processes and then crystallize and expand when hydrated. Sulfate attack occurs when sulfates in the soils react with free lime creating expansive ettringite. Both mechanisms cause cracking and a loss of strength. These mechanisms are accelerated when a pipe installed in the zone of intermittent saturation.</p>	<p>Salt cracking and sulfate attack is measured by extracting a small, pipe wall sample and performing petrographic analysis. Soil samples can also support distinction between various cracking (e.g. salt, ground movement, sulfate attack).</p>	 <p>Figure shows USGS salt content mapping in the IRWD service area. In general, the groundwater table is deep in the southeastern portion of the service area and shallower in the northwest or near existing lakes. Salt cracking could be particularly prevalent in neighborhoods like Woodbridge where most of the pipe is AC, soil salt content is elevated, and the lake allows for intermittent saturation at the pipe elevation depending on the season. In areas to the southeast where there are no lakes, the groundwater table is deep, and soil salt content is low, there is a low likelihood that salt cracking is a significant deterioration mechanism. However, in the northwestern portion of the service area, salt content is moderate and the groundwater table is shallower so the likelihood of salt crack is elevated. Relative to other utilities outside of Southern California, the low levels of salts and sulfate attack in IRWD's systems is likely contributing to much longer anticipated useful life. For example, even though the IRWD's AC pipes are just as old as AC pipes in San Antonio, soils in San Antonio have high concentrations of salts so their AC pipe are breaking 10 times more often and will have a much shorter life than the IRWD's AC pipe.</p>	<p>Soil sample analysis and petrographic analysis should be collected in the northwestern portion of the system or anywhere in the system near a lake due to moderate likelihood of salt cracking. If data verify no salt-cracking nor sulfate attack, future testing protocols could exclude petrographic and soil sampling to improve program cost-effectiveness.</p>
<p><b>GROUND MOVEMENT</b></p> <p>Occurs where ground movement initiates cracks and a loss of strength within the pipe wall. In areas where slopes are steep, the long-term slope creep can drive ground movement cracking. In areas where the groundwater is deep and the moisture content of the soils is variable due to seasonal rainfall patterns, soil shrinkage and swelling is typically the dominant driver for ground movement initiated cracking. In these cases, breaks are often concentrated just before the first significant rainfall of the season because the dry soils between the pipe and the groundwater table shrink no longer supporting the pipe from breaking. For example, at East Bay MUD who owns thousands of miles of AC pipe, AC break rates just before the first significant rain occurs are roughly 5 times higher than during the rainy season, even after accounting for changes in demands and pressures in the system.</p>	<p>Ground movement cracking is measured by extracting a small, pipe wall sample and performing petrographic analysis. Soil samples can also support distinction between various cracking (e.g. salt, ground movement, sulfate attack). Soil is tested for linear extensibility, which measures how much soils expand when saturated. Higher levels of linear extensibility will result in increased stresses and likelihood for ground movement induced cracking.</p>	 <p>Figure shows USGS linear extensibility mapping in the IRWD service area. Fortunately, areas with the most expansive soils also have shallow groundwater tables. As a result, ground movement due to soil shrink swell is expected to be much lower in IRWD's service area. Some exceptions are in the Tustin area and portion of Irvine. Break history in these areas show a 40% increase in break rate during October and November when groundwater tables are often the deepest. Slow ground creep could also be a significant ground movement issue in the areas where the slope is steep.</p>	<p>No additional testing is recommended for ground movement. However, additional analysis should be performed related to major sources of ground movement (e.g. shrink-swell and slope creep) to understand how these factors will impact remaining useful life.</p>
<p><b>CALCIUM LEACHING</b></p> <p>Calcium leaching is a chemical reaction where calcium is dissolved and carried away from the calcium-silicate-hydrate and other cement products in the concrete mix resulting in a loss of strength. While calcium leaching can occur on the external surface (particularly where groundwater is prevalent), it is typically most severe on the inside of the pipe wall where the water conveyed by the pipe is the perfect media to dissolve and carry away the calcium. Industry research shows that water chemistry can have a modest impact on the rate of degradation although manufacturing quality is also important.</p>	<p>Calcium leaching is measured by extracting a small, pipe wall sample and performing energy dispersive spectroscopy (EDS) testing.</p>	 <p>While the water conveyed in IRWD's System is not particularly aggressive to AC pipe since IRWD made improvements to the Michelson plant, due to prolonged exposure, it is expected that calcium leaching will be a significant factor in deterioration.</p>	<p>Pipe samples should be collected and tested opportunistically as part of this project. If this deterioration mechanism is verified as the primary driver for deterioration, IRWD should consider an on-going program after this project to sample AC pipes whenever they are exposed for another reason. This would reduce the cost of future condition assessment activities by roughly 90% since the vast majority of the testing cost is in exposing the pipe and restoring the excavation area.</p>

In the past, utilities have used expensive and disruptive testing methods (e.g. crush, burst, tensile, and flexural testing) that require long, full-circumference pipe samples be taken. However, Water Research Foundation Project 4480 showed that these tests are not cost-effective, particularly when much less expensive and less invasive tests (e.g. energy dispersive spectroscopy, hardness, soil, and acoustic testing) provide an equal or better correlation to break performance. Based on this research, utilities<sup>4</sup> with proactive AC condition assessment programs have now moved away from disruptive testing methods and towards opportunistic assessments.

**If the date of the sample is included in the data management standards, remaining useful life can be calculated** using a modified version of ANSI/AWWA-C401 which considers the most prominent mechanism for AC pipe failure. This information can be used to validate long-term CIP budgeting and inform risk assessment results.



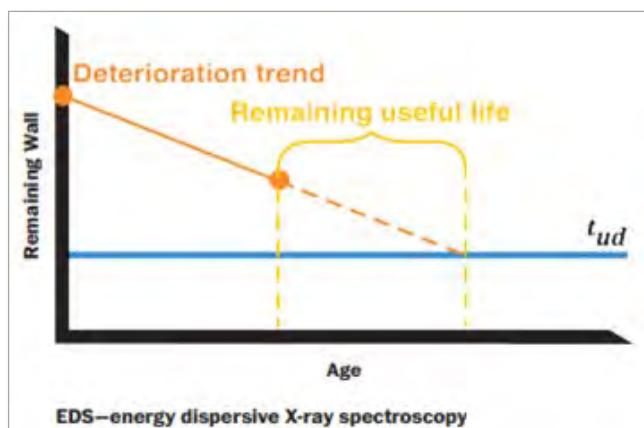
**Dave Spencer, Eric Scherch, and the City of Carlsbad developed a two-year tactical plan and 5-year road map for pipeline condition assessment including opportunistic assessments, low cost and low impact corrosion assessments and high resolution in-pipe assessment of the highest priority pipelines aligned with available budget for best value condition assessment.**

### DETAILED CONDITION ASSESSMENT PLANS

There is a smaller portion of the IRWD system that is so critical, a more proactive condition assessment strategy is warranted. A targeted pipeline condition assessment program on these critical pipes will support cost effective system management and risk mitigation by:

- extending the life of some pipes found to be in good condition,
- preventing breaks in other pipes found to be in poor condition,
- identifying the most cost-effective renewal technology and project extents, and
- increasing confidence in decision making.

HDR will collaborate with IRWD to develop prudent strategies, policies, **data management and visualization strategies**, and budgets that can be used to manage risk through condition assessment of critical mains (e.g. DRWF pipeline, Irvine Lake pipeline, and Baker pipeline). This will include a definition of which pipes qualify for planned condition assessment, policies for how often to inspect those pipes<sup>6</sup>, the appropriate technology to use, planning level unit costs, and long-term budgeting to incorporate into the CIP.



At Mesa Water District, remaining wall thickness and the age of the pipe at the time the pipe was tested was used to extrapolate remaining useful life. This award winning<sup>5</sup> approach supported data driven decision making **saving \$100K per year in testing costs and \$230M in replacement costs compared to the age-based analysis.**

<sup>4</sup>Walnut Valley WD, Mesa WD, Suburban Water Systems, San Bernardino County, Irvine Ranch WD, Vista Irrigation District, Padre Dam MWD, Sweetwater Authority, City of Carlsbad, San Dieguito WD, Rancho California WD, Orange Water & Sewer Authority, East Bay BUD, Contra Costa WD, City of Santa Cruz, City of Sacramento, and Tucson Water.

<sup>5</sup>California Municipal Utilities Association award for Outstanding Programs Benefitting Customers and Local Communities (2020), Journal of AWWA Feature Article (2019), and Finalist for ACWA “Claire A. Hill Agency Award for Excellence” for their Pipeline Integrity Testing Program (2018).

<sup>6</sup>For example, at Suburban Water Systems, a policy was adopted to perform condition assessment on critical mains before they reach 80% of their age-based useful life.



The Detailed Condition Assessment Plans will be developed for pipelines that meet the criteria for planned condition assessment. In parallel with condition assessment project prioritization, we will facilitate a workshop to present and discuss phased approaches. **Phased approaches start with lower cost indirect screening methods first to collect information in a way that has less impact on the community and can eliminate higher cost inspection methods. This approach saved Padre Dam Municipal Water District \$1M in unnecessary high resolution inspection.**

The workshop will identify the range of inspection methods and technologies available for the different pipe materials and diameters. Inspection methods will be grouped into the categories shown in the following table. We will also cover the various contracting options that are available to IRWD for procuring specialty engineering services and construction and inspection services for the assessment projects. A particular emphasis will be placed on materials and diameter ranges associated with projects anticipated to be completed under the Detailed Condition Assessment Plans. **Sufficient upfront planning of field inspection activities is highly critical for yielding safe, organized, efficient, and well-coordinated field activities.** Part of the planning process is identifying key roles and responsibilities for all the parties involved, including consulting engineers, IRWD staff, the contractor, and the technology provider, which includes identification of individuals who have the authority to make critical and timely decisions in the field to keep the work moving.

**CONDITION ASSESSMENT INSPECTION METHODS WORKSHOP PRESENTATION AND DISCUSSION TOPICS**

- Soil Corrosivity Surveys & CP System Evaluations
- Assessment Methods for Non-Metallic Pipe
- Lower Effort, Limited Data Inspection Methods
- High Resolution Inspection Methods
- Contracting Options for Condition Assessment

**OPTIONAL TOPICS**

- Leak Detection
- Pressure Monitoring

IRWD can reduce the cost of the inspections by as much as 30% by providing “site support” services such as a storage yard, crane, confined space entry support, portable sanitation facilities, etc., in addition to IRWD provided services for community outreach, traffic control, permitting, and other such items.

District Provided Services	Contractor Provided Services	Civil Site Support Services Required for Inspections
(Some may not apply to all inspection methods)		
<input type="checkbox"/>	<input type="checkbox"/>	Piping modifications for launching or extracting inspection tools (design, fabrication, construction)
<input type="checkbox"/>	<input type="checkbox"/>	Capture devices for inspection tools (design, fabrication, installation)
<input type="checkbox"/>	<input type="checkbox"/>	Excavations for pipe access
<input type="checkbox"/>	<input type="checkbox"/>	Storage yard
<input type="checkbox"/>	<input type="checkbox"/>	Local equipment rental
<input type="checkbox"/>	<input type="checkbox"/>	Cranes/operators
<input type="checkbox"/>	<input type="checkbox"/>	Tagline purchase/install
<input type="checkbox"/>	<input type="checkbox"/>	Lock-out/tag-out
<input type="checkbox"/>	<input type="checkbox"/>	Dewatering
<input type="checkbox"/>	<input type="checkbox"/>	Flow adjustments
<input type="checkbox"/>	<input type="checkbox"/>	Pipe modifications
<input type="checkbox"/>	<input type="checkbox"/>	Air valve removal
<input type="checkbox"/>	<input type="checkbox"/>	Access flange removal
<input type="checkbox"/>	<input type="checkbox"/>	Clean vault
<input type="checkbox"/>	<input type="checkbox"/>	Provide ladders
<input type="checkbox"/>	<input type="checkbox"/>	Confined space entry support
<input type="checkbox"/>	<input type="checkbox"/>	Clean out pipe
<input type="checkbox"/>	<input type="checkbox"/>	On-site power/generators
<input type="checkbox"/>	<input type="checkbox"/>	Lighting for night work
<input type="checkbox"/>	<input type="checkbox"/>	Excavations for verification of defects
<input type="checkbox"/>	<input type="checkbox"/>	Permits
<input type="checkbox"/>	<input type="checkbox"/>	Traffic control
<input type="checkbox"/>	<input type="checkbox"/>	Public relations/ROW access notifications
<input type="checkbox"/>	<input type="checkbox"/>	Portable sanitation facilities
<input type="checkbox"/>	<input type="checkbox"/>	Other general contractor or utility services

**IRWD can reduce the cost of inspections by 30% by taking on some of the tasks that are required for the field work. Before HDR writes a performance spec for contractors to bid on the pipe inspection work, HDR will ask IRWD which of the following items IRWD is capable of and willing to take on with your own forces.**



The unit cost of pipeline inspections (cost per foot or cost per mile) can also be reduced by bundling groups of small to mid-size pipelines together into a single mobilization by the contractor and technology provider. For larger diameter pipelines, the cost per mile can be reduced by inspecting the entire length of pipeline, not just short segments.

**The Detailed Condition Assessment Plans will include the following topics for each pipeline inspection project:**

1. Background information on pipe or pipe system
  - a. Location map
  - b. Approximate total length to be inspected; start and end points; access and appurtenances
  - c. As-built drawings
  - d. Manufacturer lay drawings and pipe specs (if available)
  - e. Construction information (if available)
2. Recommended inspection method(s)
  - a. Overview of inspection methods and technologies
  - b. Access requirements
  - c. Potential Impacts to operations
  - d. Other considerations such as public notifications, traffic control needs, permitting requirements, safety, and risk mitigation
3. Roles and responsibilities of parties during inspection planning and field inspections
4. Preliminary budget
5. Overall schedule with budget allocations.
6. Recommended inspection frequency

**Dan Ellison and HDR performed condition assessment of 14 miles of 48- to 60-inch potable water pipeline for Western Municipal Water District's Mills Gravity Pipeline using lower cost corrosion and leak detection technologies to identify needed repairs and targeting future inspection locations.**

**RFP TASK 5 DETAILED CONDITION ASSESSMENT PLANS FOR PIPELINES**

**Objective:** Develop prudent condition assessment strategies, policies, budgets, data management, and visualization dashboards that can be used to manage risk. Develop a detailed condition assessment plan for several critical pipes.

**Deliverables:**

- Detailed Condition Assessment Plan Dashboard & Data Management Strategy
- Opportunistic Condition Assessment Plan Dashboard and Data Management Strategy
- GIS Results of Analysis
- Work to be documented as a Chapter in the Draft and Final Pipeline Management Technical Memorandum

**RFP TASK 6 REMAINING USEFUL LIFE ANALYSIS**

**Objective:** Estimate remaining useful life to validate long-term CIP budgeting and inform risk assessment results.

**Deliverables:**

- Meeting Minutes
- Remaining Useful Life Dashboards & Data Management Strategy
- GIS Results of Analysis
- Work to be documented as a Chapter in the Draft and Final Pipeline Management Technical Memorandum





**TASK GROUP 4**  
 RFP Task 3, 8, 9 (CIP Report) & Opt. Task 10

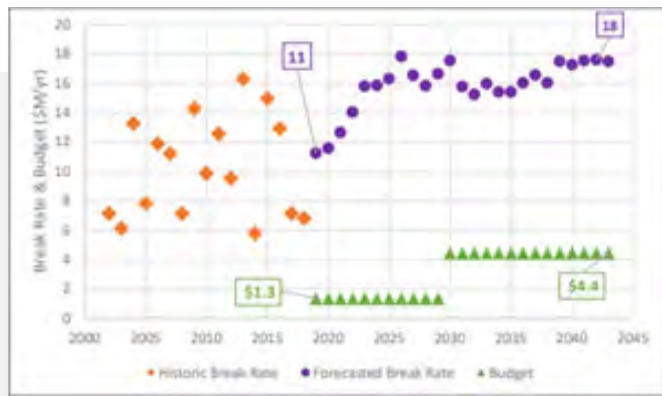
**Task Group 4**  
**Level of Service and CIP Development**

The purpose of this Task Group is to develop a prioritized, risk-based list of CIP pipeline projects which is anticipated to include investments in pipeline condition assessment, cathodic protection, and renewal. To quantify the value of these investments and establish prudent CIP budgets, HDR will leverage IRWD’s existing data to develop a dynamic fifty-year service level forecast. Investment levels will be placed in the context of national, regional and local benchmarking to illustrate how the IRWD’s proposed service levels and investments compare. This information will **leverage HDR’s distribution system performance database, which includes over 500 benchmarks from around the country. This will help you quantify and communicate transparent, defensible, and reasonable budget alternatives and help key stakeholders strike the appropriate balance between near-term costs and long-term service levels for your community.** IRWD’s water main break rate is roughly ten times better than the national average. Therefore, it is likely that IRWD will choose an investment option that will save tens of millions of dollars relative to large age-based investments. This service level forecasting tool will be one of the many dashboards provided allowing staff to dynamically change the level of service criteria (i.e. annual expenditures, miles of pipe replaced per year, breaks per year, etc.) in the future and adapt to changing conditions.

HDR will review and validate IRWD’s existing replacement planning model (RPM/IRIS) unit costs based on observed replacement cost at IRWD and surrounding communities and work with IRWD to identify any required modifications.

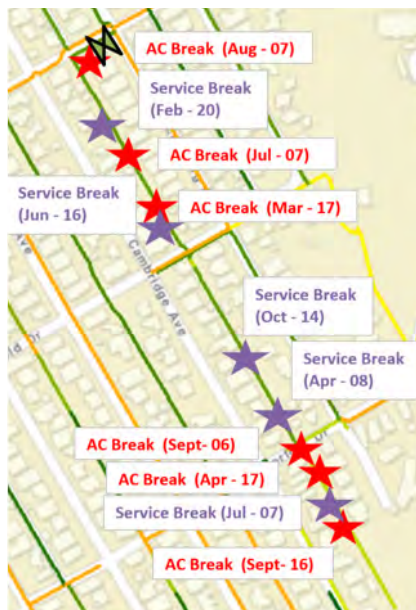
HDR will develop a decision logic framework which leverages the results from previous tasks to identify, package, and prioritize CIP projects. The framework will enable IRWD to periodically refresh CIP projects and priorities as new data becomes available. In Optional Task 10, HDR could apply this logic to existing data to identify and package CIP projects.

In addition to pipe replacement and condition assessment investments, another critical CIP investment area is cathodic protection investments that will extend the life, function, or value of the infrastructure. Cathodic protection improvements are often concentrated in high consequence pipelines and serve as a cost-effective way



**As we did for the Rainbow Municipal Water District, HDR’s dynamic service level forecasting tool will help IRWD model the impact of various investment levels and develop prudent and defensible CIP budgets based on the unique needs of your community.**

to extend the life of that infrastructure. IRWD currently has a significant backlog of cathodic protection improvements, some of which, could be capitalized and would serve as a component of the most cost-effective portfolio of investments to sustain desired service levels. David Spencer and Brien Clark (who has an intimate knowledge of these proposed improvements) will work with IRWD staff to determine which improvements should be prioritized and integrate into the CIP Plan.



**Dave Spencer developed and applied project packaging rules for San Dieguito Water District to develop transparent, defensible, and prudent CIP projects such as replacement of this 6-inch pipe on Edinburg Street.**



### VALUE ADDED SERVICE

Development of capital projects can be daunting and requires an approach that builds consensus and creates a defensible CIP program. HDR's goal is to bring the most value while empowering decision makers to manage the complexities of the utility with confidence. We will use a data-driven methodology to develop, prioritize, and optimize the CIP. HDR combines project delivery, capital, operations and maintenance, and funding for a truly holistic look at implementing projects in a way that makes sense to internal and external stakeholders. **The figure on the right describes the main steps in the process. These three key elements will benefit IRWD:**

- 1. PRIORITIZATION:** Prioritize projects based on risk and benefits using a proven and collaborative approach.
- 2. OPTIMIZATION:** Optimize project sequencing to efficiently use available financial and human capital resources to deliver projects.
- 3. FUNDING ANALYSIS:** Understand the benefits of different financing and funding mechanisms and make informed budget requests and promote stable rate changes. established in the prioritization phase, the platform communicates the realization of benefits over time, meaning that as the CIP is implemented you will be able to refer back to your original goals and demonstrate real progress.



This approach provides an objective way to prioritize projects, operations and maintenance so that improvements are made at the right time to extend asset lives. We have successfully used this tool for similar major capital planning efforts for:

- West Basin Water District
- Johnson County Wastewater (KS)
- Fort Collins Utilities (CO)
- Dallas Water Utilities (TX) - (in progress)
- Cedar Rapids (IA)



### RFP TASK 3 LEVEL OF SERVICE

**Objective:** Forecast service levels based on various CIP investment alternatives to quantify and communicate prudent budget alternatives and help key stakeholders strike the appropriate balance between near-term costs and long-term service levels for your community.

**Deliverables:**

- Meeting Minutes
- Service Level Forecasting Dashboard & Data Management Strategy
- Work to be documented as a Chapter in the Draft and Final Pipeline Management Technical Memorandum

### RFP TASK 8 REPLACEMENT COSTS

**Objective:** Validate IRWD’s existing replacement planning model (RPM/IRIS) unit costs based on observed replacement cost at IRWD and surrounding communities and work with IRWD to identify any required modifications.

**Deliverables:**

- Replacement Cost Dashboard & Data Management Strategy
- Work to be documented as a Chapter in the Draft and Final Pipeline Management Technical Memorandum

### RFP TASK 9 CAPITAL IMPROVEMENT PLAN AND REPORT

**Objective:** Develop a decision guideline which leverages the results from previous tasks to identify, package, and prioritize CIP projects. The guideline will enable IRWD to periodically refresh CIP projects and priorities as new data becomes available.

**Deliverables:**

- CIP Dashboard & Data Management Strategy
- Work to be documented as a Chapter in the Draft and Final Pipeline Management Technical Memorandum

### OPTIONAL RFP TASK 10 PROJECT PACKAGING AND 10-YEAR CIP

**Objective:** Apply CIP guideline to existing data to identify and package CIP projects.

**Deliverables:**

- Work to be documented as a Chapter in the Draft and Final Pipeline Management Technical Memorandum

## Task Group 5 Data Management and Implementation Support

TASK GROUP 5  
 RFP Tasks 1 & 9 (Dashboards)

The purpose of this Task Group is to identify software and data management practices that will position IRWD to efficiently and continuously collect and leverage data to make good decisions and dashboards that will help to monitor and communicate the program.

Effective data management and software selection will be critical to development of a sustainable, internally driven program. HDR has supported the integration of condition assessment and risk management solutions for utilities around the country. This support can range from advisory support (to augment IRWD staff knowledge with lessons learned from other utilities) through turn-key implementation of off-the-shelf solutions.

Our team has leveraged a wide variety of software solutions including machine learning, GIS-based scripts, Model Builder, InfoAsset Planner, CMMS-based solutions, business intelligence solutions, and Microsoft based solutions. Each of these solutions may be appropriate for a particular utility depending on their unique challenges and objectives. Unlike other firms, HDR does not partner with nor profit through a particular software vendor. As a result, HDR can provide independent recommendations founded in industry best practice to help you choose the best solution based on your unique needs. The outcome of this task will be a system that enables IRWD to efficiently consume and transform new data collected, integrate it within a cloud-based data store, and update the resulting recommendations including condition scores, consequence of failure (CoF) scores, likelihood of failure (LoF) scores, risk scores, individual pipe replacement costs, annual pipe replacement costs, and the replacement needs based on different levels of service. It is anticipated that this solution will leverage licenses and systems IRWD already owns, manages, and feels comfortable using including IRWD’s Azure cloud, Esri Enterprise Agreement, Microsoft G5 Enterprise license, and extensive experience with Power BI implementation and usage. HDR will document how data is organized and train staff on how to update the analysis and dashboard on a regular basis. This will ensure updates of the analysis and dashboard are repeatable and owned by IRWD staff.

The method for defining data driven condition scores, CoF scores, LoF scores, risk scores, individual pipe replacement costs, annual pipe replacement costs, and the replacement needs based on different levels of service will be defined in Task 3 through Task 8. Once we know how to use the data to make decisions, the first step of this task will be developing a strategy for data storage and database architecture. We expect data will be stored in IRWD's existing cloud-based Azure tenant but we will verify that decision during the project. Alternatives could include a data lake or simply using a OneDrive folder which may provide equivalent outcomes while minimizing complexity and increasing transparency for IRWD staff who are not familiar with Azure. HDR will facilitate a workshop within one month of initiation of this task to review the strength and weaknesses of each alternative and make a decision about which data storage platform to utilize.

An ontology for the expected data fields will be developed for each input data source. HDR will work with IRWD to define a standard data input file format with no manual transformation steps. IRWD may choose to schedule those updates on-demand and/or automatically with a defined update frequency. Input files may include but are not limited to IRWD's GIS data (e.g. pipes, services, valves, leak detection, cathodic protection), Maximo, the Hydraulic Models, SCADA, and the Replacement Planning Model. Input files are also expected to include additional records currently stored outside of IRWD's existing enterprise systems such direct condition assessment records.

The second step of this task is developing a data pipeline. Core to the data pipeline will be an ETL that ingests raw data, combines data from different sources, and updates the resulting recommendations including condition scores, CoF scores, LoF scores, risk scores, individual pipe replacement costs, annual pipe replacement costs, and the replacement needs based on different levels of service. Development of the data pipeline will allow for dynamic encoding of the analysis. Specifically, the data pipeline will programmatically process and analyze updated raw data added into the underlying

data structure. The goal of data pipeline design will be to minimize the steps required for IRWD to complete analysis updates.

In order to deliver a solution that IRWD staff can own and carry forward, it is important to consider IRWD's licenses and preferences in analytical platforms. Based on our current understanding, we recommend using a custom Esri Toolbox as the primary analytical pathway and the Power BI Platform as the primary pathway for data consumption and visualization. By performing the analysis in a GIS environment, all variables, spatial and non-spatial, will be calculated dynamically. This will enable IRWD to leverage the advanced analytical and spatial capabilities of the Esri software while displaying and parsing the results within a more familiar and user-friendly interface commonly used at IRWD (Power BI). For power Esri users, the Esri Toolbox will also provide the ideal interface to perform ad-hoc analysis and interrogation of the results. This platform decision will be verified with staff prior to development. Alternative platforms which could be completed within this scope and fee of this task include 1) a Power BI only solution (where data pipeline and analytics are simplified to eliminate the need to utilize advanced Esri analytics) or 2) an Esri only solution where the data pipeline and analytics are performed within an Esri Toolbox solution and analysis consumption is designed to occur with the Esri suite of solutions. HDR will facilitate a workshop within one month of initiation of this task to review the strength and weaknesses of each alternative platform, review similar solutions HDR has developed for other utilities, and decide which data pipeline platform to utilize.

In order to efficiently execute this project, it will be important to determine which software will best support the program. IRWD has expressed interest in evaluating whether machine learning could support this program. **HDR has evaluated the efficacy of a variety of different machine learning software solutions at utilities such as the cities of Phoenix, St. Petersburg, Santa Cruz, Bellevue, and Tucson Water.** This evaluation included measuring the accuracy of break predictions by performing side-by-side pilots of machine learning and

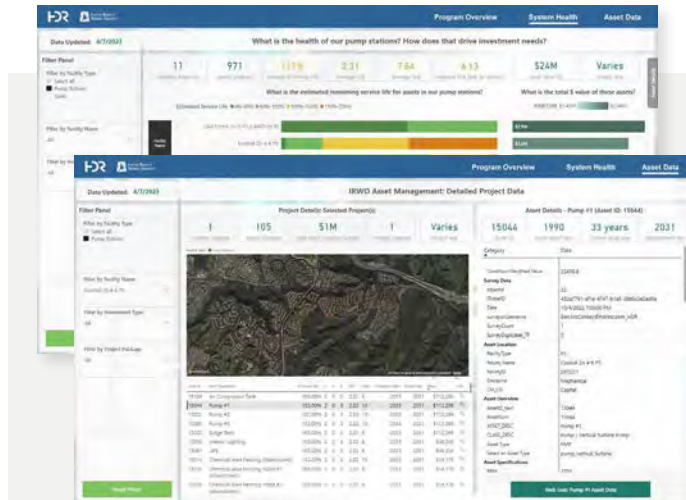
tradition risk assessment tools to quantify which tool best predicted breaks. This was achieved by providing each vendor with a small task order and break data which excluded the last three years of data to forecast future breaks. The break forecasting from each method/ software was then compared to the actual breaks that occurred over the past three years to measure which software was most effective in forecasting break locations. HDR would propose that we present these findings to IRWD in an early workshop and determine whether it would be appropriate to perform a similar pilot with the IRWD's data which is included as Optional Task 11 in the scope of services.



**As at Tucson Water, raw Fracta results can be difficult to interpret. HDR will help IRWD group and sort GIS pipes into meaningful projects to support practical risk assessment and decision making.**

A primary challenge for asset management programs is converting a large volume of data into clear, meaningful insight. Fortunately, new technologies help address this challenge, providing dynamic visualizations across thousands to millions of rows of data. HDR has a deep bench of business intelligence experts who will assist IRWD with both data strategy and asset management dashboard implementation.

The asset management dashboards will serve as a quick way to access data developed through the project, including condition scores, consequence scores and risk scores, and well as individual pipe recommendations and replacement cost from an interactive map-based platform. The capital planning recommendation will be presented visually as well, to relate annual pipe replacement costs based on selected level-of-service strategies.



**For IRWD's Pump Station and Tanks program, HDR centralized data and used dashboards to answer key questions such as "What investments are needed to maintain our infrastructure".**

HDR will document how data is organized in a Draft and Final TM and train staff on how to update the dashboard on a regular basis. In our experience, we have found that developing YouTube style "how to" training videos are a more effective learning tool than traditional training methods. Research has shown video training is a more efficient means to convey and retain knowledge as the end user can see and hear every click. Unlike traditional training, the video lives in perpetuity and can be referenced at any time. The user can pause, rewind, or advance to the exact section of interest.

Two videos will be developed which target two distinct audiences. The first video walks through the process of updating the model. This will include training on the data store architecture and the code which imports, transforms, integrates, and analyzes this data and presents the results analysis. This will ensure update of these tools and analyses are efficient, repeatable, and owned by IRWD staff. The second video would be targeted towards the end user of the dashboard explaining how to access and interpret each component of the dashboard. After the training videos are reviewed by IRWD staff, HDR will provide up to 12 additional hours of training to address questions and update the training video to clarify issues identified. Note, if IRWD prefers to have traditional training (as opposed to a video), HDR will convert the scope above to more traditional training.

### RFP TASK 1 DATA MANAGEMENT

**Objective:** Implement a solution enabling IRWD to efficiently consume and transform new data collected and integrate it within a cloud-based data store.

**Deliverables:**

- Meeting Minutes
- Draft and Final Memo documenting the work performed in this task including the database architecture.
- A training video which shows how to update the analysis to incorporate new data.

### RFP TASK 9 DASHBOARDS

**Objective:** Implement a solution which leverages the cloud-based data store to update the resulting recommendations in a spatially enabled dashboard.

**Deliverables:**

- Meeting Minutes
- A dynamic, spatially enabled dashboard which includes condition scores, CoF scores, LoF scores, risk scores, individual pipe replacement costs, annual pipe replacement costs, and the replacement needs based on different levels of service.
- A training video which shows the end user of the dashboard how to access and interpret each component of the dashboard.
- Work to be documented as a Chapter in the Draft and Final Pipeline Management Technical Memorandum

**Assumptions:**

- HDR will not be required to customize or directly write to any of IRWD's enterprise systems (e.g. Maximo, ESRI).

## The partnership between IRWD and HDR is based on a foundation of teamwork, collaboration, and technical excellence.

Our team will work with you to successfully deliver a high-quality product to accomplish IRWD's goals. We welcome the opportunity to discuss any part of our proposed approach, scope, and level of effort to deliver this important project that meets your needs.



# B

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## Team







**TEAM**

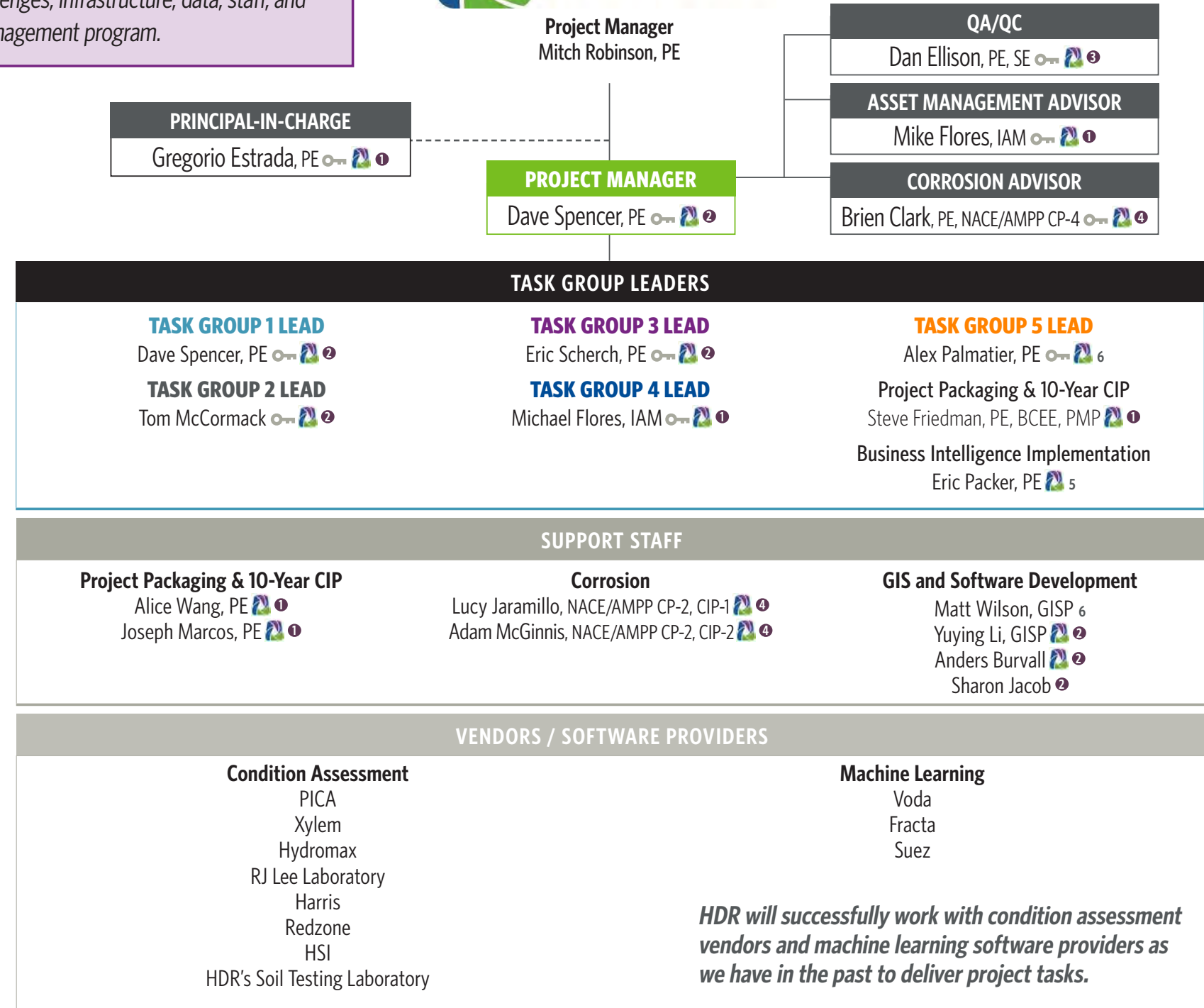
Taking on this important project requires a team that has worked together successfully, understands your existing program, and has the experience to deliver a staff owned program. The HDR Team was built to deliver just that! Our Team Leader, **Dave Spencer, PE**, has more than 20 years of experience specializing in pipeline condition assessment, risk analysis, level of service forecasting, data management, and CIP program development. **He has helped over 100 utilities and co-written four books on those topics including Water Research Foundation Project 4480 - Development of an Effective Management Strategy for Asbestos Cement Pipe.** This is particularly important because asbestos cement pipe makes up almost 90% of IRWD's pipes that are 40 years or older. Dave is based locally which allows us to regularly collaborate in-person, so we can listen to your unique challenges, share our lessons learned, and work together to define the best solutions for IRWD. He will serve as IRWD's primary point of contact and provide technical coordination and oversight for the Capital Improvement Plan and Asset Management for Potable and Non-potable Pipelines Project.

The organization chart summarizes the team that Dave has assembled to meet the unique needs of this project. Dave has worked closely with this team on similar projects and selected team members who know your unique challenges, staff, infrastructure, and data. This knowledge, in conjunction with our experience implementing similar programs around the country, will enable us to hit the ground running and focus limited IRWD staff time on key decisions. **Brien Clark has supported IRWD's corrosion protection and pipe sampling program for 17 years. Michael Flores, Tom McCormack and Eric Packer recently developed IRWD's pump station asset management plan. Our knowledge will reduce the level of effort from both IRWD and HDR staff while developing the pipeline program. Alex Palmatier, will lead the development team and facilitate workshops to review viable information technology solutions, review similar solutions HDR has developed for other utilities, and help IRWD staff decide which platform to use going forward. Our proposed project leadership and core team will not be reassigned without prior IRWD approval.**

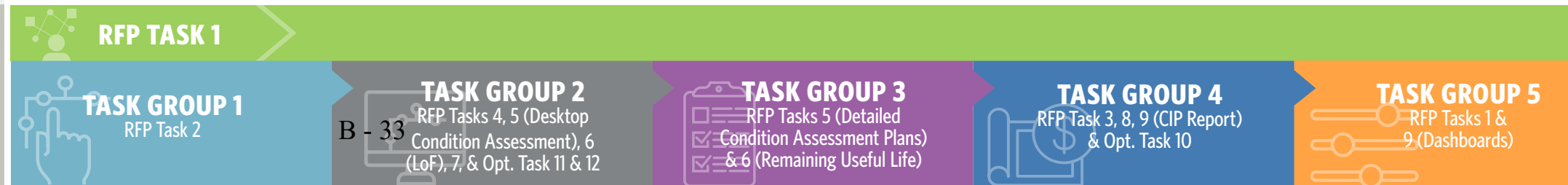
**LEGEND**

- 🔑 Key staff    <sup>2</sup> San Diego, CA    <sup>4</sup> Claremont, CA    <sup>6</sup> Winston-Salem, NC
- <sup>1</sup> Irvine, CA    <sup>3</sup> Ventura, CA    <sup>5</sup> Anchorage, AK
- Locally Based (number indicates office location)
- 👤 History working with IRWD

*Majority of our team members are locally based and have worked with you and know your challenges, infrastructure, data, staff, and asset management program.*



We have included our approach sequence highlighting our five task groups and their respective RFP Tasks. **Task Group Leads have been color-coded in the Organizational Chart for easy reference.**



The key to efficient project delivery is assigning qualified professional staff who can deliver results. Our proposed key personnel will not be reassigned without prior approval from IRWD.



**DAVE SPENCER, PE**  
PROJECT MANAGER | TASK GROUP 1 LEAD

Dave has developed and implemented condition assessment and renewal programs encompassing over 100,000 miles of pipelines around the country. These are practical, results-oriented programs for aging potable and recycled water infrastructure. He efficiently tailors a program to match the client's size and objectives and is

adept in interacting with all levels of a utility organization from field staff to management. Dave has been engaged in the evaluation of several emerging condition assessment technologies including: acoustic testing, non-destructive examinations, an ASCE Manual of Practice, and other Water Research Foundation projects. **Dave's approach to leadership is collaborative and transparent - engaging his clients and key stakeholders to make consensus-driven decisions, resulting in projects and programs that are right-sized and staff-owned. Dave's experience leading prioritization programs for large and small utilities equips him to deliver a process that is right-sized for IRWD.**

**RELEVANT EXPERIENCE**

- ✓ IRWD, AC Pipe Evaluation Services
- ✓ Water Research Foundation 4480, Effective Management of AC Pipe
- ✓ Padre Dam Municipal Water District, Pipeline Risk Prioritization & Condition Assessment
- ✓ Mesa Water District, Integrity Pipeline Testing
- ✓ Rancho Water, Project Management Services for Pipeline Condition Assessment



**DAN ELLISON, PE, SE**  
QA/QC

**Dan provides innovative ideas and input throughout the project process to improve overall condition assessment program quality.**

Dan has gained national and international recognition as an expert on pipe assessment, rehabilitation, and trenchless construction, having authored several books on the subject. He is the founding Chair of the Water Main Condition Assessment Committee of

AWWA and is the former Chair of the Water Main Rehabilitation Committee. Dan has written eight different books for the Water Research Foundation and has helped develop infrastructure management programs for utilities all across the U.S.

**RELEVANT EXPERIENCE**

- ✓ IRWD, Pump Stations & Tanks Condition Assessment Replacement & Rehab Study
- ✓ Padre Dam MWD, Risk Prioritization and Condition Assessment for Potable Water Pipelines



**GREGORIO ESTRADA, PE**  
PRINCIPAL IN CHARGE

Gregorio has been working with IRWD for more than 17 years on critical projects ranging from planning, design, and construction. He has successfully delivered large-scale projects such as the Michelson Water Recycling Plant's Phase 2 Expansion, and the 2021 Sewage Treatment Master Plan. **Gregorio's history and**

**relationships with IRWD staff brings a solid understanding of all of IRWD's facilities, design standards, company culture, and staff preferences that will increase our team's efficiency and understanding for this project. As Principal-in-Charge Gregorio will provide oversight and assistance to the team to maintain efficient delivery of the work, and will serve as liaison with District staff to inform decision-making.**

**RELEVANT EXPERIENCE**

- ✓ IRWD, Pump Stations & Tanks Condition Assessment Replacement & Rehab Study
- ✓ IRWD, Michelson Water Recycling Plant Phase 2 Expansion
- ✓ IRWD, Sewage Treatment Master Plan
- ✓ IRWD, Michelson Water Recycling Plant, Emergency Discharge Regulatory Support and Facility Design



**BRIEN CLARK, PE, NACE CP-4**  
CORROSION ADVISOR

Brien has more than 21 years of experience and serves as HDR's Corrosion Technical Services Manager. Brien is certified by NACE International as a cathodic protection specialist and technologist. He is also certified as a Corrosion Prevention Field Technician and for Abnormal Operating Conditions in Field Operations by the National Center for Construction Education and Research

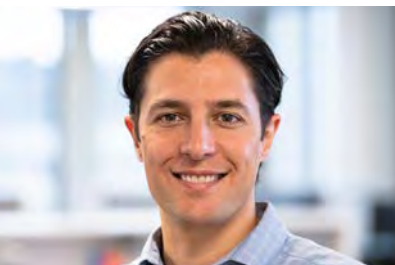
as well as Cathodic Protection Interference. **Over the past 17 years, Brien has supported IRWD's corrosion protection and pipe sampling program and has been leading the Cathodic Protection On-Call project with IRWD. Brien's deep understanding of IRWD's historic cathodic protection infrastructure, procedures, and data will position our team to efficiently leverage that data to drive prudent decisions.**



**TOM MCCORMACK**  
TASK GROUP 2 LEAD

Tom is a utility performance and information technology expert with 12 years of experience working with water and wastewater utilities. His experience includes helping clients implement asset management programs, improving utility operations and maintenance and capital planning work practices, risk modeling, and aging infrastructure renewal forecasting. **Tom is familiar**

**with IRWD's facilities and standards having led the Data Management and Business Intelligence for IRWD's Pump Stations and Tanks Condition Assessment Replacement and Rehabilitation Study.**



**ERIC SCHERCH, PE**  
TASK GROUP 3 LEAD

**Over 50,000 miles of pipelines across the United States have benefited from Eric's assessment and management programs through reduced risk and cost savings.** Eric's expertise lies in developing condition assessment programs and renewal forecasting for water and wastewater. He focuses on risk analysis, operations and maintenance, condition assessment, aging infrastructure

renewal forecasting, program alternative evaluation, information systems development, regulatory reporting, staffing analyses, and work planning. Eric has the unique ability to engage staff and understand both engineering and operations, which results in programs that staff can support. Eric has served as a technical lead for clients such as Orange County Sanitation District, City of Vista, City of San Diego, Winston-Salem, West Basin Municipal Water District, San Antonio Water Systems, Seattle Public Utilities, Winston-Salem, and Eugene Water & Electric Board.

**RELEVANT EXPERIENCE**

- ✓ IRWD, Corrosion Control and AC Pipe Evaluation Services
- ✓ City of Phoenix, RCP Main Inspection and Condition Assessment Program
- ✓ Water Research Foundation, WRF 4480, Development of an Effective AC Distribution Pipe Management Strategy for Utilities

**RELEVANT EXPERIENCE**

- ✓ IRWD, Pump Stations & Tanks Condition Assessment Replacement & Rehab Study
- ✓ Padre Dam Municipal Water District, Potable Water Pipeline Condition Assessment
- ✓ Suburban Water Systems, Water Main Study

**RELEVANT EXPERIENCE**

- ✓ IRWD, Pump Stations & Tanks Condition Assessment Replacement & Rehab Study
- ✓ Padre Dam Municipal Water District, Pipeline Risk Prioritization and Condition Assessment for Potable Water Pipelines
- ✓ Olivenhain Municipal Water District, Pipeline Inspection and Condition Assessment
- ✓ City of Carlsbad, Condition Assessment Plan



**MIKE FLORES, IAM**

ASSET MANAGEMENT ADVISOR | TASK GROUP 4 LEAD

Mike has 30 years of experience in the water and wastewater field with a primary focus on infrastructure management, operations, maintenance, and capital program planning. He has managed or served as a senior technical resource on several large and complex projects, focused on planning and implementing business process changes and information management solutions for wastewater

collection system operations, maintenance, and capital planning programs. **Most recently, Michael served as the Project Manager for IRWD’s Pump Stations and Tanks Condition Assessment Replacement and Rehabilitation Study bringing a solid understanding of IRWD’s facilities, standards, company culture, and staff preferences that will increase our team’s efficiency and understanding for this project.**

**RELEVANT EXPERIENCE**

- ✓ IRWD, Pump Stations & Tanks Condition Assessment Replacement & Rehab Study
- ✓ OC SAN, Asset Management Plan
- ✓ Johnson County Wastewater, Facility Asset Management Plan
- ✓ City of Los Angeles, Sewer R&R Program Plan and Implementation and CIP



**ALEX PALMATIER**

TASK GROUP 5 LEAD

Alex is one of HDR’s leading program delivery specialists—providing utility management solutions, system integration services, and repeatable business protocols for transmission, water main, and wastewater infrastructure across the nation. As HDR’s Utility Management Services Technical Director, he focuses on supporting teams with the development and execution of technology-driven

strategies for water and wastewater pipeline projects, with an emphasis on increased efficiency, cost savings, and improved decision-making processes. **Alex will lead the development team, facilitate early workshops with IRWD to review the strengths and weaknesses of platform alternatives, review similar platforms HDR has developed for other utilities, and help IRWD decide which platform to use moving forward.**

**RELEVANT EXPERIENCE**

- ✓ City of St Petersburg, Pipeline Condition Assessment Program
- ✓ Orange Water and Sewer Authority, Distribution System Prioritization Model
- ✓ City of Lawrence, Lawrence Transmission Main Inspection
- ✓ Great Lakes Water Authority, Linear System Integrity Program

**Team Commitment to the Project**

Current project workload allows the members of our proposed team to begin on this project immediately upon selection. With this in mind, our team members were carefully selected not only for their expertise, but also for their availability to work on the project for its duration. We follow well established and time proven procedures to manage our project workload. Our strong team is available to begin work upon Notice-to-Proceed.

The requirements and commitment of our team members will vary over the duration of the project as the technical needs change. The table to the right shows the estimated time we expect our team members to dedicate to delivering the Capital Improvement Plan & Asset Management for Potable and Non-potable Pipelines project.

AVERAGE PERCENTAGE OVER LIFE OF PROJECT (%)					
TEAM MEMBER   CLASSIFICATION	5	10	15	20	25
Dave Spencer   Project Manager / Task Group 1 Lead	[Progress bar: 100%]				
Dan Ellison   QA/QC	[Progress bar: ~5%]				
Brien Clark   Corrosion Advisor	[Progress bar: ~5%]				
Tom McCormack   Task Group 2 Lead	[Progress bar: ~15%]				
Eric Scherch   Task Group 3 Lead	[Progress bar: ~10%]				
Mike Flores   Task Group 4 Lead	[Progress bar: ~10%]				
Alex Palmatier   Task Group 5 Lead	[Progress bar: ~10%]				

C

Experience



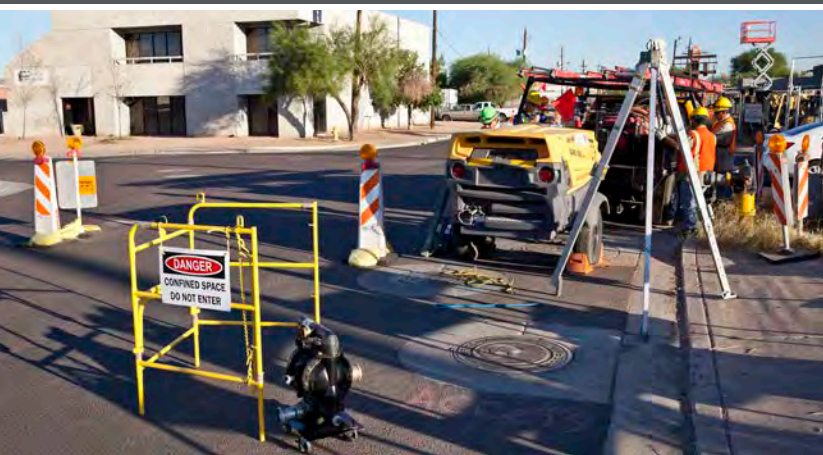
**EXPERIENCE**

For more than a century, HDR has partnered with clients to shape communities and challenge the boundaries of what's possible. Our expertise spans more than 11,000 employees, in more than 225 locations around the world—and counting. Our engineering, architecture, environmental, and construction services bring an impressive breadth of knowledge to every project. We consistently rank high in Engineering NewsRecord's (ENR's) Top 500 Water and Water Design firms in the nation. HDR currently ranks No. 5 in Top 20 Water, No. 5 in Water Supply, and No. 6 in Top 500 Design Firms.

For 60 years, HDR has been providing consulting corrosion engineering services to clients in California and across the United States. This makes HDR one of the oldest corrosion engineering firms in the United States. In addition, HDR owns and operates a state-of-the-art Corrosion Laboratory since 1993 in Southern California that specializes in soil and water corrosivity analysis and research with unrivaled QA/QC procedures to confirm the accuracy and relevance of our data.

Our specialty Pipeline Condition Assessment and Asset Management group brings industry leading expertise to clients throughout the United States. Our approach to Condition Assessment is tested and proven, furthering your return on investment and the reliability of your system. HDR led the development of the 2019 AWWA M77 – Condition Assessment of Water Mains and is a key contributor in the ongoing efforts to update the manual.

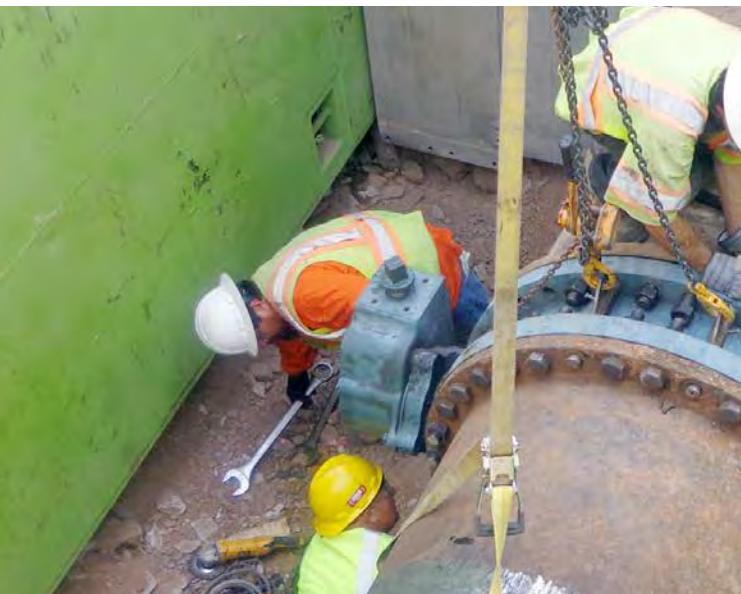
We offer a combination of industry leadership in condition assessment and intimate knowledge of the District's facilities from recent projects. Our team comprises of local industry-recognized leaders and a bench of national resources to provide you the services required to execute a successful and seamless project.



Below is a matrix of similar projects that our team has completed. These projects below represent successful partnerships with our clients, providing cost-saving solutions, reaching performance goals, and creating programs that are program-specific and right-sized.

**Client**

Client	Key Staff						Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Task 7	Task 8	Task 9	Task 10	Task 11				
	Spencer	Ellison	Clark	McCormack	Scherch	Flores	Palmatier	Project Management	Data Management	Review Existing Data	Level of Service	Consequence of Failure Assessment	Desktop Condition Assessment	Detailed Condition Assessment Plan	Likelihood of Failure & Remaining Useful Life	Risk Assessment	Replacement Cost	Dashboards	CIP & Report	Project Packaging & 10-Year CIP	Machine Learning Analysis
City of Phoenix, AZ*	✓		✓		✓			🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹
Mesa Water District, CA*	✓	✓	✓		✓			🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹
Padre Dam Municipal Water District, CA*	✓	✓	✓	✓	✓	✓	✓	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹
WRF 4480 Effective Management of AC Pipe*	✓	✓	✓					🔹		🔹				🔹							
Suburban Water Systems, CA*	✓	✓	✓	✓	✓	✓	✓	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹
Irvine Ranch Water District, CA	✓	✓	✓	✓	✓	✓		🔹		🔹				🔹		🔹	🔹				
City of Bellevue, WA	✓	✓		✓	✓	✓	✓	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹
City of Tucson, AZ	✓						✓	🔹		🔹				🔹		🔹	🔹				🔹
City of Santa Cruz, CA	✓	✓		✓	✓			🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹
City of Honolulu, HI	✓	✓		✓	✓		✓	🔹		🔹				🔹		🔹	🔹	🔹	🔹	🔹	🔹
Department of Water Resources, CA	✓							🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹
City of Carlsbad, CA	✓	✓	✓	✓	✓	✓	✓	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹
Contra Costa Water District, CA	✓	✓		✓	✓			🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹
City of Des Moines, IA	✓	✓			✓			🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹
City of St. Petersburg, FL	✓	✓		✓	✓		✓	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹
Johnson County, KS	✓	✓	✓	✓	✓	✓	✓	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹
Lee's Summit, KS	✓	✓						🔹		🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹
City of Lincoln, NE	✓	✓						🔹		🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹
City of McKinney, TX	✓			✓	✓			🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹
Long Beach Water District, CA	✓	✓	✓	✓	✓	✓		🔹		🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹
City of Omaha, NE	✓	✓	✓		✓			🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹
Sweetwater, CA	✓	✓		✓	✓	✓		🔹		🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹
OWASA, NC	✓	✓			✓		✓	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹
Rainbow Municipal Water District, CA	✓	✓	✓	✓	✓	✓		🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹
Rancho California Water District, CA	✓	✓	✓	✓	✓			🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹
San Dieguito Water District, CA	✓			✓	✓			🔹		🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹
San Francisco Public Utilities Commission, CA	✓	✓						🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹
San Bernardino County, CA	✓			✓	✓			🔹		🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹
Vista Irrigation District, CA	✓	✓	✓		✓			🔹		🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹	🔹
WRF 5170 Improved Risk Management from Condition Assessment Data	✓	✓	✓	✓	✓			🔹		🔹				🔹		🔹					🔹
WRF 4471 Leverage Condition Assessment for Metallic Pipe Renewal Decision	✓	✓	✓					🔹		🔹				🔹		🔹					🔹



## Pipeline Condition Assessment and Asset Management Program

City of Phoenix, Arizona, *Phoenix, AZ*

### PROJECT DETAILS

#### REFERENCE

Matthew Woodland, PE  
City of Phoenix, AZ, Water Services Department  
200 West Washington St., 8th Floor, Phoenix, Arizona 85003  
602.495.3753  
matthew.woodland@phoenix.gov

#### DATES

2016 - Current

#### CONTRACT VALUE

\$1M

#### KEY STAFF

Dave Spencer; Brien Clark; Eric Scherch

### VALUE ADDED

Optimized Phoenix's \$50 million dollar per year program to **replace the RIGHT pipe, at the RIGHT time, using the RIGHT technology.**

HDR has been working with the City to develop a pipeline condition assessment and asset management program. This has included: 1) forecasting service levels and establishing prudent budgets for pipeline condition assessment and replacement, 2) condition assessment, 3) risk assessment, 4) evaluation of machine learning, 5) implementation of staff owned data management and information system to identify and prioritize CIP projects, and 6) inspection and assessment of the City's Reinforced Concrete Pipe (RCP) water transmission mains. The City has over 7,000 miles water mains and consist of a variety of pipeline materials including, PVC, AC, RCP, CCP (AWWA C303), CRCP, DIP, and CIP. Using the as-builts, pipe age, break history, location, critical facility served, etc. HDR completed a desktop analysis analyzing and classifying each of the pipelines. For each pipeline a consequence and likelihood of failure was calculated, and pipeline criticality rating was determined. HDR then worked with the City of Phoenix to classify each of the pipelines into one of four categories depending on their priority for assessment.

In addition to the desktop analysis, HDR completed a detailed technology assessment evaluating the type, data received, cost, inspection requirements, etc. to determine a set of recommended technologies that could be used to assess each of the pipelines. In order to further evaluate the pipelines and to assist in recommending the required technology, HDR also coordinated a pilot test with various in pipe inspection vendors to evaluate the requirements for completing the inspection, cost, and quality of data received.

**Control of Costs:** HDR completed project within budget.

**Quality of Work:** HDR completed the initial AM plan in 2016 and continues to support elements of the program including a recent task to evaluate and implement machine learning.

**Ability to Meet Schedule:** HDR met all project deadlines.





#### PROJECT DETAILS

##### REFERENCE

Karyn Igar, PE  
Mesa Water District  
1965 Placentia Ave, Costa Mesa, CA 92627  
949.207.5452  
Karynl@mesawater.org

##### DATES

2017 - 2021

##### CONTRACT VALUE

\$430K

##### KEY STAFF

Dave Spencer; Dan Ellison; Brien Clark; Eric Scherch; Gregorio Estrada; Luzmilla Jaramillo; Adam McGinnis; Steven Friedman

#### VALUE ADDED

Based on the results of this analysis, it was determined that most of the system has significant **remaining useful life saving approximately \$230 million** in capital investments. A condition based-decision making process was developed to identify pipeline that warranted near term renewal or more detailed condition assessment. This project also had the following awards: CMUA for California Utilities for Outstanding Programs Benefiting Customers and Local Communities (2020), Finalist for ACWA "Clair A. Hill Agency Award for Excellence" for their Pipeline Integrity Testing Program (2018), Journal of AWWA Feature Article (2019).

## Pipeline Integrity Testing Program

**Mesa Water District (Mesa Water®), Costa Mesa, CA**

Mesa Water® hired HDR to estimate the remaining useful life of Mesa Water®'s pipelines based on measured pipeline properties, rather than using an age-based approach. HDR developed a Board adopted pipeline decision making process which leverages readily available data to identify remaining useful life, identify specific pipes that required condition assessment of replacement, continuously refined the testing program to provide the most value to the ratepayers, refined business processes to collect high quality break and condition assessment data, and updated GIS / Asset Data to reflect work in this project.

**HDR performed assessments of Mesa Water®'s existing system:**

**CATHODIC PROTECTION SYSTEMS SURVEY:** Performed corrosion control testing and evaluation of 19 pipelines, including approximately 141,000 linear feet of cement mortar and coated welded steel pipe, concrete cylinder pipe, cement mortar lined and coal tar coated welded steel pipe, and ductile iron pipe. Through this evaluation, HDR provided Mesa Water® with an updated assessment of the existing cathodic protection system and recommended the need to rehabilitate the system that is depleted or approaching the end of their intended life.

**CELL-TO-CELL SURVEY OF 12-IN CIP:** Performed cell-to-cell potential survey of a critical 12-inch cast iron pipeline approximately 3,800 linear feet along W 19th Street between Placentia and Harbor Boulevard, which is a high traffic area (vehicular and pedestrians). The survey identified several locations with the highest potential for active corrosion and perform additional testing through external corrosion direct assessment to inform decision making for pipe replacement.

**Control of Costs:** HDR completed project within budget.

**Quality of Work:** HDR was initially hired in 2017 and continues to perform as-needed condition assessment services.

**Ability to Meet Schedule:** HDR met all project deadlines due to coordination with Client throughout the project duration.





## Pipeline Risk Prioritization & Condition Assessment of Potable Water Pipelines

**Padre Dam Municipal Water District, Santee, CA**

HDR provided engineering planning services to Padre Dam Municipal Water District related to the development of a potable water pipeline risk prioritization model. This risk based prioritization approach would allow the District to move systematically forward with a more comprehensive condition assessment program for its potable water pipelines. This prioritization led to pipeline condition assessment including approximately 25,000 linear feet of indirect assessment followed by direct assessment. The condition assessments was utilized to make repair, rehabilitation, replacement or future monitoring recommendations on pipelines and inform the development of the District's future potable water pipelines Condition Assessment Program and Capital Improvement Program budgeting. The scope of services included two phases and multiple step processes that used selected specialized methods to assess the condition of high priority pipelines.

Phase 1 of the Project included a detailed data review, an indirect condition assessment of pipelines, a direct assessment design, a direct assessment proposal evaluation, negotiation of scopes and budgets with vendors and contractors, and preparation for the work plan for direct assessment.

Phase 2 of the Project included direct condition assessment, analysis of results, risk model updates, identification of specific monitoring or capital improvement recommendations for assessed pipelines and program recommendations for future condition assessments and capital improvements.

**Control of Costs:** Project was completed \$25,000 under budget.

**Quality of Work:** No changes orders for construction work or condition assessment work.

**Ability to Meet Schedule:** HDR met all project deadlines due to coordination with Client throughout the project duration.

### PROJECT DETAILS

#### REFERENCE

Michael Hindle, PE  
Padre Dam Municipal Water District  
9300 Fanita Pkwy, Santee, CA 92071  
619.258.4632  
mhindle@padre.org

#### DATES

2017 - 2023

#### CONTRACT VALUE

\$980K

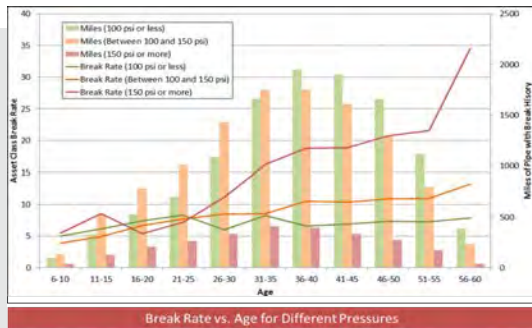
#### KEY STAFF

Dave Spencer; Dan Ellison; Brien Clark; Eric Scherch; Tom McCormack; Michael Flores; Alex Palmatier; Eric Packer; Lucy Jaramillo; Adam McGinnis

### VALUE ADDED

This award winning project resulted in **over \$1M in savings in condition assessment, \$16M per year in pipeline replacement deferral, and a set of dashboards that enabled Staff to communicate the benefits of the program** to their staff, managers, and board members. Project received the ASCE San Diego Award for Sustainability in addressing aging infrastructure.





## WRF 4480, Development of Effective Asbestos Cement Distribution Pipe Management Strategy for Utilities

Water Research Foundation (WRF), Denver, CO

HDR led this research project that involved developing an effective strategy for management of utility Asbestos Cement (AC) pipe assets, which included condition assessment and remaining life prediction, water quality optimization, rehabilitation and replacement, renewal prioritization modeling, and cost analysis. The project involved analysis of more than 100 samples of pipe and 20 years of break data for 1,100 miles of East Bay Municipal Utility District (EBMUD) AC pipes.

A variety of testing methodologies were applied to the same pipe in order to quantify the value and cost-effectiveness of each technology. Testing evaluated included EDS, hardness, crush tests, flexural tests, burst test, acoustic testing, stain testing, measured diameter to thickness ratio, water quality, stress information, and system performance as measured through break history.

**Control of Costs:** Delivered on budget.

**Quality of Work:** Peer reviewed and adopted.

**Ability to Meet Schedule:** Delivered on schedule.

### REFERENCE

Jian Zhang, Research Manager  
 Water Research Foundation  
 6666 W. Quincy Ave.  
 Denver, CO 80235  
 303.347.6114  
 jzhang@waterRF.org

### DATES

2012 - 2014

### CONTRACT VALUE

\$270K

### KEY STAFF

Dave Spencer; Dan Ellison;  
 Brien Clark



## Water Main Study

Suburban Water Systems, Covina, CA

Suburban Water Systems (SWS) owns 860 miles of water main infrastructure. As the system continues to age and deteriorate, one of SWS's primary goals is to cost effectively sustain desired service levels. To accomplish this, HDR helped SWS initiate this effort to continuously improve the way distribution infrastructure is managed. The three primary accomplishments of this project are to:

- Establish prudent, transparent, and defensible investment levels that will enable SWS to sustain desired levels of service as the system continues to age and deteriorate.
- Focus those investments by developing an advanced risk model to make sure ratepayers realize the greatest return on their investment.
- Develop a cost effective condition assessment program for asbestos cement pipe which makes up roughly 80% of the system.
- Develop a staffing plan to continuously execute the program.
- Gain state approval for the program.

**Control of Costs:** HDR completed project within budget.

**Quality of Work:** HDR continues to support Suburban with emerging asset management needs.

**Ability to Meet Schedule:** HDR met all project deadlines due to coordination with Client throughout the project duration.

### REFERENCE

Zhaohui (Josie) Sun, PE.  
 Asset Management & Planning Eng.  
 Suburban Water Systems  
 1325 N. Grand Avenue, Suite 100  
 Covina, CA 91724-4044  
 626.543.256  
 zsun@swwc.com

### DATES

2018 - 2023

### CONTRACT VALUE

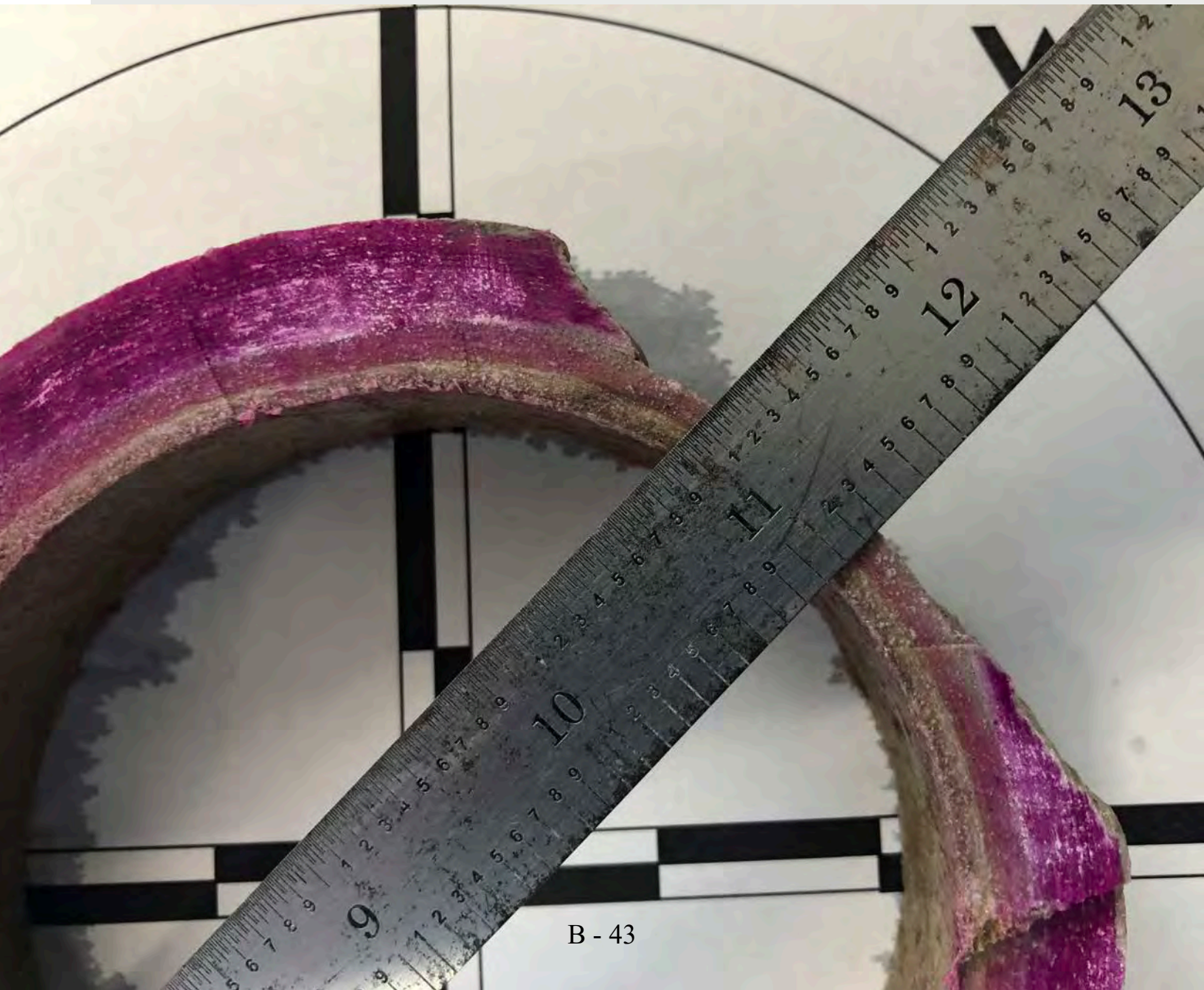
\$135K

### KEY STAFF

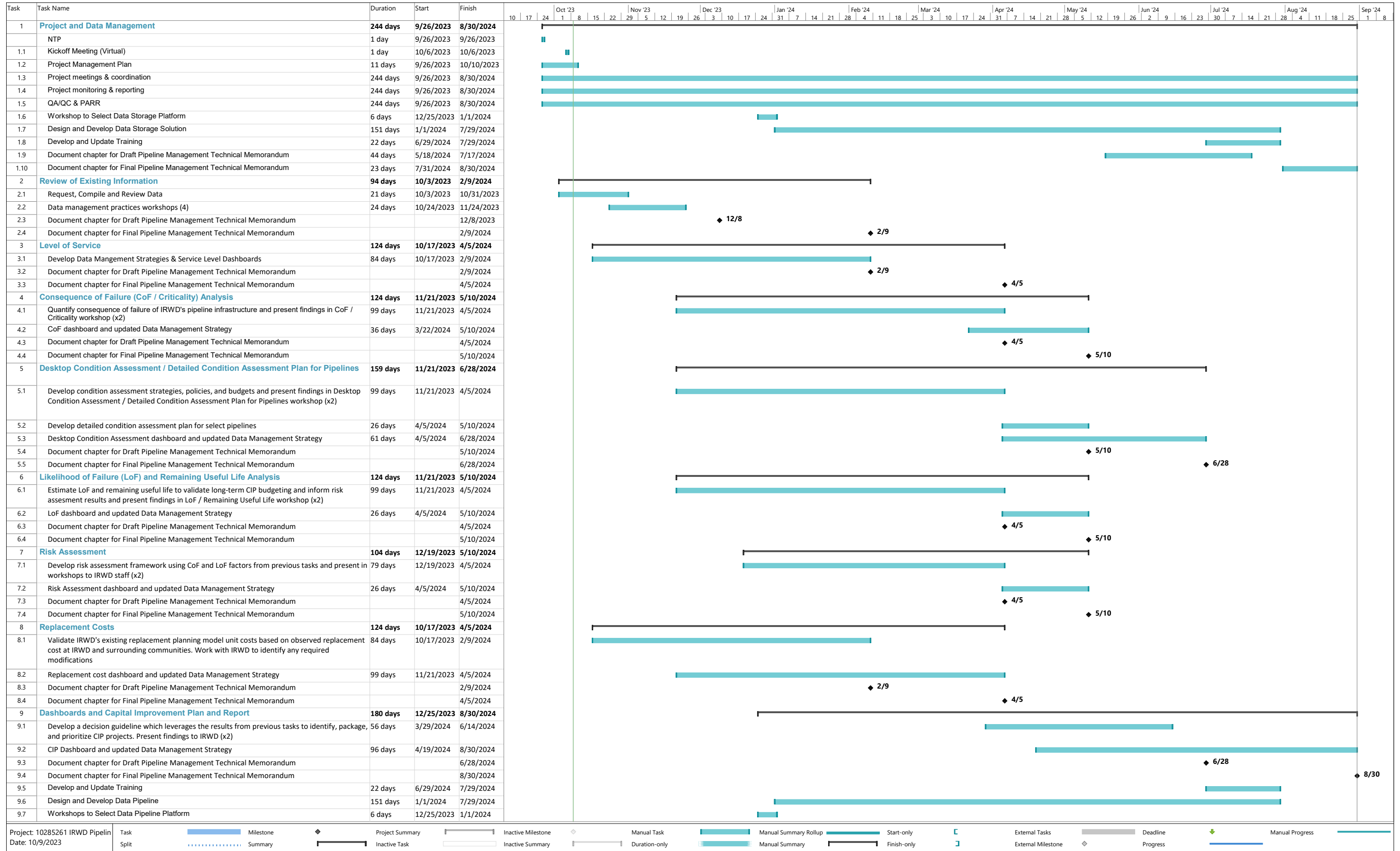
Dave Spencer; Eric Scherch;  
 Tom McCormack; Alex Palmatier

D

Schedule




**SCHEDULE**



October 16, 2023

Prepared by: K. Lew / B. Rios / E. Akiyoshi

Submitted by: K. Burton

Approved by: Paul A. Cook 

## ENGINEERING AND OPERATIONS COMMITTEE

### PLANNING AREA 1 ORCHARD HILLS NEIGHBORHOOD 4 DOMESTIC WATER IMPROVEMENTS

#### SUMMARY:

Irvine Community Development Company, LLC (ICDC) is proceeding with development of Planning Area 1 (PA1) Orchard Hills Neighborhood 4 (NH4), which includes the construction of streets, storm drains, domestic water, sanitary sewer, and recycled water improvements. As part of the development, ICDC will construct IRWD capital facilities under an existing Supplemental Reimbursement Agreement. Staff recommends that the Board:

- Authorize the General Manager to accept ICDC's construction contract with Shoffeitt Pipeline, Inc. in the amount of \$216,470 for the PA1 Orchard Hills NH4 Domestic Water Improvements project; and
- Authorize the addition of PA1 Orchard Hills NH4 Domestic Water Improvements, Project 12781 in the amount of \$382,000 to the FY 2023-24 Capital Budget.

#### BACKGROUND:

ICDC is moving forward with the residential development of PA1 Orchard Hills NH4. Orchard Hills NH4 is bound by Portola Parkway to the south, Rattlesnake Reservoir to the west, Jeffrey Road to the east, and National Community Conservation Plan conservation land to the north. The project location map is provided as Exhibit "A". ICDC will design and construct IRWD's capital domestic water improvements as part of this development. The required IRWD capital facilities are documented in the February 2005 Planning Areas 1 and 2 Sub-Area Master Plan and all subsequent addenda and updates prepared by Stantec Consulting Services, Inc.

The design and construction of the IRWD capital facilities will be performed under the terms of the Master Reimbursement Agreement between IRWD and ICDC approved by the Board in May 1997 and as further refined in the Supplemental Reimbursement Agreement. The Supplemental Reimbursement Agreement for PA1 was approved in May 2005.

The PA1 Orchard Hills NH4 Domestic Water Improvements project consists of approximately 1,500 feet of 12-inch domestic water pipeline, all within future streets for the development. ICDC retained Hunsaker & Associates, Inc. to prepare the plans and received bids from three contractors. The bids ranged from \$216,470 to \$258,393. ICDC recommends awarding the construction contract to the low bidder, Shoffeitt Pipeline, Inc., for a bid amount of \$216,470 as provided in Exhibit "B". In addition, ICDC has received consultant proposals for surveying, geotechnical observation and testing, and construction support services. Proposals for field archeological and paleontological monitoring were not necessary because those costs were included as a part of the previously approved improvements. Staff has reviewed the consultant

proposals and the construction bids and found the amounts to be acceptable. A summary of the PA1 Orchard Hills NH4 Domestic Water Improvement costs is shown as follows.

Construction (Shoffeitt Pipeline)	\$216,470.00
Construction Support (Hunsaker & Associates)	\$8,580.00
Geotechnical Services (NMG)	\$4,761.00
Survey Services (Hunsaker & Associates)	\$8,990.00
ICDC Administration Fee (1%)	<u>\$2,164.70</u>
	\$240,965.70

**FISCAL IMPACTS:**

Staff requests the addition of Project 12781 to the FY 2023-24 Capital Budget as follows:

Project No.	Current Budget	Addition <Reduction>	Total Budget
12781	\$0	\$382,000	\$382,000

**ENVIRONMENTAL COMPLIANCE:**

Construction of capital domestic water facilities for Orchard Hills, Neighborhood 4 is subject to California Environmental Quality Act. In conformance with the California Code of Regulations Title 14, Chapter 3, Article 7 an Environmental Impact Report was certified by the City of Irvine, the lead agency on June 14, 2005 (SCH# 2004041080).

**RECOMMENDATION:**

That the Board authorize the General Manager to accept Irvine Community Development Company, LLC’s construction contract with Shoffeitt Pipeline, Inc. in the amount of \$216,470, and authorize the addition of Project 12781 in the amount of \$382,000 to the FY 2023-24 Capital Budget for the Planning Area 1 Orchard Hills Neighborhood 4 Domestic Water Improvements.

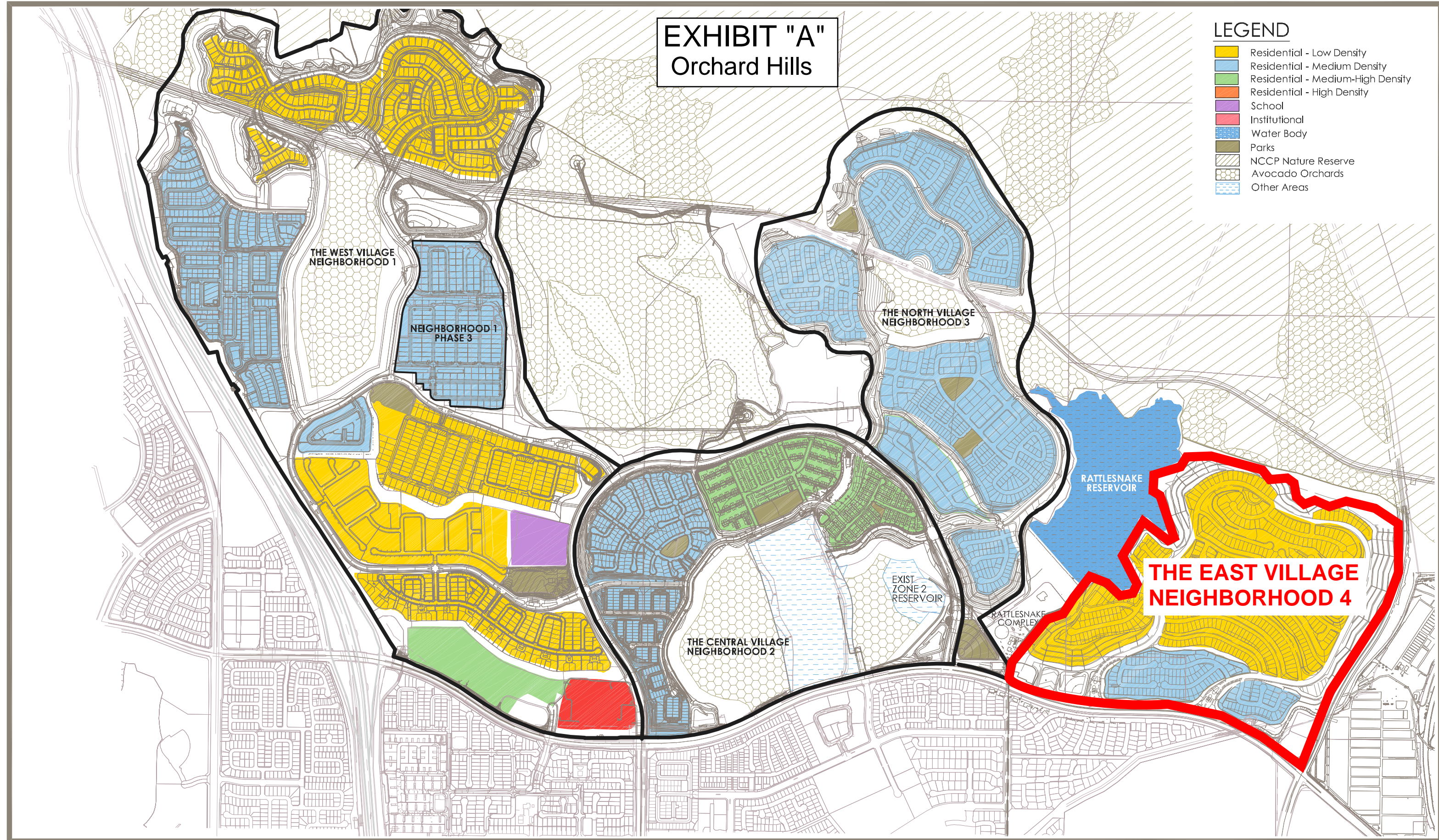
**LIST OF EXHIBITS:**

- Exhibit “A” – Location Map
- Exhibit “B” – Bid Summary, PA1 Orchard Hills NH4 Domestic Water Improvements

# EXHIBIT "A" Orchard Hills

## LEGEND

- Residential - Low Density
- Residential - Medium Density
- Residential - Medium-High Density
- Residential - High Density
- School
- Institutional
- Water Body
- Parks
- NCCP Nature Reserve
- Avocado Orchards
- Other Areas



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Exhibit "B"

BID SUMMARY  
 ORCHARD HILLS, NEIGHBORHOOD 4 - PHASE 'A'  
 TRACTS 19180, 19181, 19182, 19020  
 WET UTILITY IMPROVEMENTS  
 CONTRACT "B3-A1 "  
 (PREVAILING WAGE)  
 TASK/PC ID NO.: LD-0001.ST.43.cn04  
 BID PACKAGE NO. B00533 - NEW IRWD CAPITAL DOMESTIC WATER

c: AM Mike Morse  
TM Terri Moss  
RL Ryan Rasmussen  
 \_\_\_\_\_ File with Bid Key Map  
 \_\_\_\_\_ Erica Marioneaux - Cost Matrix

PRE-BID MEETING DATE: August 9, 2023  
 BID OPENING DATE: August 14, 2023  
 WITNESSED BY: M. Morse  
E. Marioneaux

DECLINED PRIOR TO PRE-BID: N/A  
 NO SHOW AT PREBID: N/A  
 DID NOT SUBMIT: N/A

ENGINEER'S ESTIMATE Hunsaker & Associates	LOW BIDDER Shoffeitt Pipeline Inc.	2ND BIDDER Fydaq Company	3RD BIDDER L&S Construction Inc.
--	---------------------------------------	-----------------------------	-------------------------------------

CHECK LIST

Required items to be included in bid package:

- No Bid Addendums were issued
- Corporate Seal (if applicable)
- Correct Signatures (Page V-3)
- Bid Totals Correctly
- List of SubContractors
- Equipment/Material Source Information
- Contractors Rates/Reviewed
- 10% Bid Bond
- Construction Schedule
- Non-Collusion Certificate
- Contractor Prequalified
- Fuel Letter
- PVC Letter

<input type="checkbox"/>	N/A	<input type="checkbox"/>	Did not check, as bidder was not low.	<input type="checkbox"/>	Did not check, as bidder was not low.
<input type="checkbox"/>	N/A - Note 1	<input type="checkbox"/>		<input type="checkbox"/>	
<input type="checkbox"/>	N/A - Note 1	<input type="checkbox"/>		<input type="checkbox"/>	
<input checked="" type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
<input checked="" type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
<input checked="" type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
<input checked="" type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
<input type="checkbox"/>	N/A - Note 1	<input type="checkbox"/>		<input type="checkbox"/>	
<input type="checkbox"/>	Per Construction Schedule	<input type="checkbox"/>		<input type="checkbox"/>	
<input checked="" type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
<input checked="" type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
<input type="checkbox"/>	N/A	<input type="checkbox"/>		<input type="checkbox"/>	
<input type="checkbox"/>	N/A	<input type="checkbox"/>		<input type="checkbox"/>	

Note 1 - Informal Bid required due to COI need to upsize and add new IRWD Capital work to support COI Gateway development.


CODING*	ITEM DESCRIPTION	QTY	UNIT	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL	UNIT PRICE	TOTAL
I.	<b>IRWD CAPITAL DOMESTIC WATER DELETABLE IMPROVEMENTS</b> (Developer may or may not award the Deletable Section with the Assessment District Improvements)										
A.	<b>GENERAL</b>										
1.	MOBILIZATION (NOT TO EXCEED 2% OF CONTRACT PRICE SECTIONS A-B)	1	LS	\$ 4,000.00	\$ 4,000.00	\$ 1,500.00	\$ 1,500.00	\$ 3,100.00	\$ 3,100.00	\$ 5,000.00	\$ 5,000.00
2.	PAYMENT AND PERFORMANCE BONDS (SECTIONS A-B)	1	LS	\$ 2,000.00	\$ 2,000.00	\$ 4,195.00	\$ 4,195.00	\$ 3,183.39	\$ 3,183.39	\$ 6,400.00	\$ 6,400.00
3.	DEVELOP CONSTRUCTION WATER (SECTIONS A-B)	1	LS	\$ 1,000.00	\$ 1,000.00	\$ 750.00	\$ 750.00	\$ 1,000.00	\$ 1,000.00	\$ 1,500.00	\$ 1,500.00
4.	TRAFFIC CONTROL (SECTIONS A-B)	1	LS	\$ 500.00	\$ 500.00	\$ 500.00	\$ 500.00	\$ 1,000.00	\$ 1,000.00	\$ 600.00	\$ 600.00
5.	INTERIM EROSION AND SEDIMENT CONTROL (SECTIONS A-B)	1	LS	\$ 500.00	\$ 500.00	\$ 300.00	\$ 300.00	\$ 1,000.00	\$ 1,000.00	\$ 1,500.00	\$ 1,500.00
6.	REMOVE AND DISPOSE BEES, BEE HIVES, SNAKES, AND OTHER NOXIOUS INSECTS AND ANIMALS	1	LS	\$ 500.00	\$ 500.00	\$ 500.00	\$ 500.00	\$ 1,500.00	\$ 1,500.00	\$ 1.00	\$ 1.00
7.	ALL ELSE REQUIRED AS SHOWN ON THE PLANS AND SPECIFICATIONS, BUT NOT LISTED ON THE SCHEDULE OF VALUES (SECTIONS A-B)	1	LS	\$ 500.00	\$ 500.00	\$ 50.00	\$ 50.00	\$ 1,500.00	\$ 1,500.00	\$ 1.00	\$ 1.00
B.	<b>DOMESTIC WATER IMPROVEMENTS</b> NOTE: All tees, bends, crosses, adapters, flanges, reducers, thrust blocks, tracer wire, and other fittings are to be included in the pipe unit price										
8.	INSTALL 12" PVC C-900, DR-14, WATER LINE PER IRWD STD W-17	1,437	LF	\$ 135.00	\$ 193,995.00	\$ 125.00	\$ 179,625.00	\$ 129.50	\$ 186,091.50	\$ 143.00	\$ 205,491.00
9.	INSTALL 12" BUTTERFLY VALVE, CLASS 250, FLG'D, W/ VALVE BOX PER IRWD STD W-22	2	EA	\$ 4,500.00	\$ 9,000.00	\$ 3,900.00	\$ 7,800.00	\$ 5,594.00	\$ 11,188.00	\$ 5,000.00	\$ 10,000.00
10.	INSTALL 2" AIR RELEASE AND VACUUM RELIEF PER IRWD STD W-11	1	EA	\$ 7,800.00	\$ 7,800.00	\$ 7,200.00	\$ 7,200.00	\$ 7,910.00	\$ 7,910.00	\$ 10,500.00	\$ 10,500.00
11.	REMOVE TEMPORAY FLUSH-OUT ASSEMBLY & JOIN EXISTING	2	EA	\$ 2,500.00	\$ 5,000.00	\$ 5,300.00	\$ 10,600.00	\$ 3,200.00	\$ 6,400.00	\$ 6,000.00	\$ 12,000.00
12.	ADJUST VALVE CAP TO BASE PAVE GRADE	3	EA	\$ 400.00	\$ 1,200.00	\$ 575.00	\$ 1,725.00	\$ 775.00	\$ 2,325.00	\$ 900.00	\$ 2,700.00
13.	ADJUST VALVE CAP TO FINAL GRADE	3	EA	\$ 475.00	\$ 1,425.00	\$ 575.00	\$ 1,725.00	\$ 625.00	\$ 1,875.00	\$ 900.00	\$ 2,700.00
	<b>TOTAL IRWD CAPITAL DOMESTIC WATER DELETABLE IMPROVEMENTS (SECTIONS A-B)</b>				\$ 227,420.00		\$ 216,470.00		\$ 228,072.89		\$ 258,393.00

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October 16, 2023

Prepared by: D. Drake / J. Moeder

Submitted by: K. Burton

Approved by: Paul A. Cook 

## ENGINEERING AND OPERATIONS COMMITTEE

### ANNUAL DAM SURVEILLANCE AND MONITORING PROGRAM CONSULTANT SELECTION

#### SUMMARY:

Annual Dam Surveillance Reports are required by the Division of Safety of Dams (DSOD) for all dams under its jurisdiction. The reports summarize the monitoring data and field evaluations, assess the dam's general performance, identify items that may require attention, and document the determination that the dam remains safe for continued use. Staff recommends that the Board authorize the General Manager to execute a Professional Services Agreement in the amount of \$282,911 with GEI Consultants, Inc. for IRWD's Annual Dam Surveillance and Monitoring Program for three years ending 2026.

#### BACKGROUND:

Annual Dam Surveillance Reports are completed by dam owners for dams under DSOD jurisdiction and submitted to DSOD for review. DSOD reviews the reports and provides written comments, if any, to the dam owners. Typical components of an annual dam surveillance and monitoring program include reviewing seepage and movement monitoring data, conducting field inspections, and preparing a formal report for transmittal to DSOD. The Annual Report provides a comprehensive review of collected data and comparison to historical data, a summary of site inspections, and a general assessment that the dam remains safe for continued use.

Since 2019, IRWD has retained GEI for surveillance and monitoring services for all five dams under DSOD jurisdiction. As the current dam monitoring contract expires at the end of 2023, IRWD issued a Request for Proposal (RFP) to six consultants qualified to perform dam monitoring and surveillance services. Additional elements in the RFP's scope of work included, 1) the annual inspection of the floodwall and levee around the Michelson Water Recycling Plant (MWRP), and 2) the review of IRWD's recently developed Dam Safety Program Guidelines.

#### Consultant Selection Process:

IRWD solicited proposals for annual dam surveillance and monitoring services from six consultants, including GEI, Genterra, GeoPentech, Geosyntec, Stantec, and Tetra Tech. IRWD received proposals from GEI, Genterra, Geosyntec, and Tetra Tech. Of the proposals received, GEI had the best technical approach and fee to provide the services. GEI also has over five years of experience providing annual dam surveillance and monitoring for IRWD and provides these same services for numerous dam owners throughout California and the nation. Staff found the scope of work to be commensurate with the requirements of the project and the fee to be reasonable. The consultant selection matrix is provided in Exhibit "A" and GEI's proposal is provided in Exhibit "B".

FISCAL IMPACTS:

The annual dam surveillance and monitoring services are part of the Dam Safety Program and included in the annual operating budget. These engineering services will be funded 80% by non-Irvine Lake, 15% by Irvine Lake (IRWD's 75% ownership share), and 5% by Irvine Lake (Serrano Water District's 25% ownership share). The MWRP floodwall and levee inspection will be 100% funded by the non-Irvine Lake operating budget.

ENVIRONMENTAL COMPLIANCE:

This item is not a project as defined in the California Environmental Quality Act (CEQA) as authorized under the California Code of Regulations, Title 14, Chapter 3, Section 15378.

RECOMMENDATION:

That the Board authorize the General Manager to execute a Professional Services Agreement with GEI Consultants, Inc. in the amount of \$282,911 for IRWD's Annual Dam Surveillance and Monitoring Program for three years ending 2026.

LIST OF EXHIBITS:

Exhibit "A" – Consultant Selection Evaluation Matrix  
Exhibit "B" – GEI Consultants, Inc.'s Proposal

Consultant Selection Matrix

	Weights	GEI	Genterra	Geosyntec	Tetra Tech
<b>TECHNICAL APPROACH</b>	50%				
Project Approach	100%	1	2	3	4
<b>EXPERIENCE</b>	50%				
Team	100%	1	3	2	4
Weighted Score		1.00	2.50	2.50	4.00
Principal-in-charge		Yrs	Yrs	Yrs	Yrs
Project Manager		Rich Sanchez 43	Joseph J. Kulikowski 53	Brian Petty 22	Ike Pace 26
Project Engineer		Emerson Revolorio 7	Douglas A. Harriman 42	Joe Goldstein 14	Michael Brown 35
QC/QA		Lorena Manriquez 22		Jerry Pascoe 28	David Paul 45
Technical Advisor		Iqbal Ahmed 32	Soma Balachandran 36	Jerry Pascoe 28	
		Man-hours	Man-hours	Man-hours	Man-hours
Task 1 Data Plotting and Evaluation		225	534	419	701
Task 2 Field Inspections		150	180	244	524
Task 3 Reporting		360	525	556	1,539
Task 4 MWRP Floodwall Inspection		105	183	177	68
Task 5 Review of DSP Guidelines		56	31	120	57
Task 6 As-Needed Services		198	-	-	-
Annual Spillway Inspection		114	-	-	-
Misc.		-	48	-	-
<b>TOTAL HOURS</b>		<b>1,094</b>	<b>1,501</b>	<b>1,219</b>	<b>2,888</b>
<b>FEE</b>					
San Joaquin Dam, 3 years		\$42,560	\$69,390	\$69,505	\$154,492
Sand Canyon Dam, 3 years		\$31,958	\$59,310	\$59,268	\$154,492
Syphon Dam, 3 years		\$31,164	\$50,040	\$64,986	\$154,492
Rattlesnake Dam, 3 years		\$31,958	\$61,590	\$63,717	\$154,492
Santiago Creek Dam, 3 years		\$31,958	\$59,310	\$57,127	\$154,492
MWRP Floodwall and Berm		\$25,107	\$31,230	\$47,069	\$17,478
DSP Guidelines		\$14,278	\$7,370	\$36,399	\$16,374
As-needed Support		\$44,832	\$45,000	\$45,000	\$45,000
Annual Spillway Inspection		\$29,096	\$0	\$0	\$0
Misc.		\$0	\$12,120	\$0	\$0
<b>Total*</b>		<b>\$282,911</b>	<b>\$395,360</b>	<b>\$443,071</b>	<b>\$851,310</b>
*Annual Spillway Inspection included in GEI's total fee, as requested by IRWD after initial proposals were received.					
Professional Liability Insurance		YES	YES	YES	YES
General Liability Insurance		YES	YES	YES	YES
<b>FORCED RANKINGS:</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>

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# Annual Dam Surveillance Reports

Proposal prepared for: Irvine Ranch Water District  
September 6, 2023 (revised October 2, 2023)



September 6, 2023 (revised October 2, 2023)

Consulting  
Engineers and  
Scientists

Mr. Jacob J. Moeder, P.E  
Engineering Manager – Dams & Storage  
Irvine Ranch Water District  
15600 Sand Canyon Avenue  
Irvine, CA 92618

**Subject: Proposal for Annual Dam Surveillance Reports**

Dear Mr. Moeder:

GEI Consultants, Inc. (GEI) has prepared the enclosed proposal to provide Irvine Ranch Water District (IRWD) with engineering services for a three-year monitoring and surveillance program for San Joaquin Dam, Sand Canyon Dam, Syphon Dam, Rattlesnake Dam, Santiago Creek Dam, and Michelson Water Recycling Plant (MWRP) Floodwall and Berm.

GEI is recognized as a leader in dam safety and has provided engineering services for more than 2,500 dam projects nationwide and nearly 280 in California – it is a core strength of our over 1,400-person firm.

Rich Sanchez, our proposed Project Manager, has over 43 years of project management, dam safety, engineering, construction, and operations experience during his career at GEI and California's Department of Water Resources (DWR) which included managing the Southern Region for the Division of Safety of Dams (DSOD). Mr. Sanchez's extensive experience includes managing and performing annual dam safety assessments and supporting dam owners address DSOD and Federal Engineering Regulatory Commission (FERC) dam safety requirements throughout California and other states

Other key members of our team include Emerson Revolorio, Project Engineer, and Iqbal Ahmed, Technical Advisor. Both have inspected, evaluated, and are very familiar with IRWD's dams and the MWRP Floodwall and Berm. In addition to their direct knowledge of IRWD's facilities, they bring unequalled knowledge regarding dam safety, monitoring, and surveillance programs, and DSOD's policies, procedures, and regulations. Dr. Ahmed is also currently managing the Santiago Creek Dam spillway improvement project for IRWD.

Our intent is for GEI to continue working closely with and supporting IRWD to ensure annual safety reports are adequately completed and all dam and floodwall safety issues are addressed within required timelines and authorized budgets.

We hope you find our proposal compelling and look forward to a positive response. Please contact Rich Sanchez at 916.350.1769 or [rsanchez@geiconsultants.com](mailto:rsanchez@geiconsultants.com), or Emerson Revolorio at 760.795.1964 or [erevolorio@geiconsultants.com](mailto:erevolorio@geiconsultants.com) if there are any questions regarding our proposal.

Sincerely,

**GEI Consultants, Inc.**

A blue ink signature of Richard Sanchez, consisting of a stylized first name and a last name that is partially obscured by a horizontal line.

Richard Sanchez, P.E.  
Vice President/Project Manager

A blue ink signature of Emerson Revolorio, written in a cursive style.

Emerson Revolorio, P.E.  
Project Engineer



## Scope

Irvine Ranch Water District (IRWD) owns and operates San Joaquin, Sand Canyon, Syphon, Rattlesnake Canyon, and Santiago Creek dams. The reservoirs impounded by these dams are used to store recycled water except for Santiago Creek Dam which IRWD jointly owns with Serrano Water District (SWD) and also stores local runoff as well as untreated water from Metropolitan Water District of Southern California. All five dams are earth embankments with heights ranging from 59 to 224 feet.

All five dams are under the regulatory jurisdiction of DWR’s, DSOD. DSOD regulates dam safety in California, with the goal of avoiding dam failure and thus preventing potential loss of life and destruction of property. Data on the five dams contained in DSOD’s September 2022 inventory of dams within their jurisdiction are summarized in **Table 1**.

IRWD maintains a dam monitoring and surveillance program where operational data and performance evaluation reports are submitted annually to DSOD for the five dams described above. This proposal is in response to IRWD’s request to provide engineering services for a three-year period to support the dam monitoring and surveillance program, and the annual inspections of the floodwalls and berms at the MWRP and San Joaquin Marsh Campus (SJMC).

**TABLE 1. INVENTORY OF DAMS**

Parameter	San Joaquin Dam	Sand Canyon Dam	Syphon Dam	Rattlesnake Canyon Dam	Santiago Creek Dam
DSOD No.	1023.000	1029.002	1029-004	1029.003	75-000
Year Built	1966	1912	1949	1959	1933
Height (feet)	224	58	59	79	136
Crest Length (feet)	873	861	843	980	1,425
Reservoir Capacity (acre-feet)	3,036	960	578	1,480	25,000
Downstream Hazard	Extremely High	Extremely High	Extremely High	Extremely High	Extremely High

Syphon, Santiago Creek, and Rattlesnake dams are currently undergoing major design improvements. The Syphon Reservoir Improvement project includes removing the existing embankment and constructing a new larger earth embankment dam. The reservoir is currently drained until a new dam is built. Construction is anticipated to begin in 2025 and be completed in 2029. The Santiago Creek Dam Outlet Tower and Spillway Improvements project includes removing the existing spillway and installing a new larger spillway structure. The project also includes removing the outlet tower and installing a new inclined outlet structure in addition to widening the crest and other ancillary improvements. Construction is anticipated to begin in 2025 and be completed in 2028. Rattlesnake Dam is currently in the geotechnical investigation phase of its design improvements project. GEI has considered these major projects and their timelines and has assumed that annual monitoring and surveillance reports for all IRWD dams are required during the 3-year contract duration. IRWD has recently developed Dam Safety Program (DSP) Guidelines that incorporates the Risk Informed Decision Making (RIDM) program,

which includes routine and non-routine dam safety activities. The guidelines include monitoring and reporting requirements that will be followed in the annual evaluations.

IRWD owns and operates the MWRP and the nearby SJMC. The MWRP provides tertiary treatment of sewer water that results in quality recycled water for industrial, commercial, landscape, and agricultural irrigation needs for the IRWD service area and is the primary source of recycled water for the district. A floodwall and berm surround the MWRP and provides protection for a 200-year flood event. The floodwall is a reinforced concrete masonry wall and is supported by a concrete pile cap with prestressed concrete piles. Segments of the floodwall are located on an earthen berm. The floodwall surrounding the SJMC is a reinforced masonry wall supported on a strip footing foundation. IRWD is requiring annual inspections and reporting on the floodwalls and berm to ensure it is performing properly and protecting the MWRP and the surrounding areas from flood risk.

## Scope of Work

Our scope of work has been divided into the following six main tasks:

- Task 1 – Data Plotting and Evaluation
- Task 2 – Field Inspections
- Task 3 – Reporting
- Task 4 – MWRP Floodwall Inspection & Evaluation
- Task 5 – Review of DSP
- Task 6 – Annual Spillway Inspection for Rattlesnake Canyon Dam and Sand Canyon Dam
- Task 7 – As-Needed Services

Descriptions of the scope of work and approach for each task are provided below.

### **Task 1 – Data Plotting and Evaluation**

IRWD will collect the following information and transmit it to GEI on a periodic basis:

- Transmitted Monthly – Water surface elevations taken daily at Rattlesnake Canyon, Sand Canyon, San Joaquin, Syphon, and Santiago Creek dams.
- Transmitted Monthly – Measurements of piezometers, monitoring wells, and seepage monitoring stations at Rattlesnake Canyon, Sand Canyon, Syphon, and San Joaquin dams and Santiago Creek Dam. We understand IRWD will be implementing an Automatic Data Acquisition System (ADAS) and monitoring instrumentation frequently at their dams. GEI assumes that IRWD will provide data from the ADAS platform monthly.
- Transmitted Monthly – Data on captured blackish sediment, identified as Organic Silt (OH), that had been collecting in the West drain weir box at San Joaquin Dam. The sediment is being monitored monthly in the West drain with a pictorial history and weight of the dried material. This information will be assessed monthly and summarized annually.
- Transmitted Annually – Measurements of surface crest monument movements for each dam.
- Continuous – Ground movement data from San Joaquin Dam and Rattlesnake Canyon Dam using Interferometric Synthetic Aperture Radar (InSAR) technology via an online platform.

During our current 3-year contract for instrumentation monitoring, GEI has developed report and graphical templates that align with IRWD's dam safety guidelines. We will continue to use the same templates and make improvements to them following IRWD's DSP guidelines and any additional input from IRWD.

GEI will add the measurement data received from IRWD to a master database monthly and produce graphical plots of the data as a function of time. Piezometer and seepage data will be plotted in combination with the reservoirs' water surface elevations and the precipitation in the area for the period being evaluated.

IRWD conducts Closed-Circuit Television (CCTV) inspections of their dam's subdrain system to visually inspect the condition of the subdrain pipes and identify potential issues or blockages. GEI will review the inspection videos and provide a summary of their interpretation in a technical memorandum. GEI assumed for budget purposes that a CCTV inspection will be conducted for one dam each year.

Blackish sediment (organic silt) collected with seepage at San Joaquin Reservoir is a long-occurring phenomenon. The sediment data and photos will be evaluated against past weights, quantities, and physical appearance. Twice a year, GEI will perform laboratory tests on the samples to characterize and analyze the material and determine if any changes have occurred. Any significant changes will be evaluated, and conclusions formulated as to possible impacts to the safety of the dam. GEI will document their evaluation and conclusions in a technical memorandum.

Survey data of the dam crests will also be plotted and evaluated. Settlement, if any, will be calculated and compared against design threshold limits (if available). Lateral movements, if any, will be evaluated to determine if they are permanent movements or possibly the result of reservoir fluctuations. GEI will review the InSAR monitoring data at San Joaquin Dam and Rattlesnake Canyon Dam monthly and notify IRWD if there are concerns with the collected data.

Trends in all measurement data will be evaluated, and engineering judgement made as to the accuracy of the data, adequacy of the instruments, the adequacy of the instrumentation network, and the performance of the dams based on the instrumentation data. GEI will follow IRWD's Seepage & Piezometer Monitoring and Movement Monitoring Guidelines and adhere to the alarm levels and response plans developed. Graphical plots of the data and GEI commentary on the graphical plots will be emailed to IRWD within five working days of receiving the monthly dataset from IRWD. Possible spurious measurements will be flagged so that IRWD can perform additional measurements to confirm or correct the data.

**Deliverables:**

- Two technical memoranda documenting characterization of sediment each year
- One technical memorandum documenting review and interpretation of CCTV inspection video each year

**Task 2 – Field Inspections**

GEI staff will perform annual field inspections of Rattlesnake Canyon, Sand Canyon, San Joaquin, Syphon dams, and Santiago Creek Dam. We will coordinate our annual inspections with IRWD staff. When possible, GEI inspections will be conducted during DSOD inspections. GEI will also be available to inspect the dams after significant earthquakes (greater than magnitude 5.0) as required by IRWD. DSOD requires that outlet gates be exercised at least once a year to demonstrate adequate operability in

case of an emergency. GEI will witness the operations of the outlet gates if it can be coordinated during DSOD inspections. We recommend that field inspections be performed together with IRWD dam operators so that any unusual conditions observed by the operators can be conveyed and discussed.

The dam inspections will be led by Emerson Revolorio supported by Rich Sanchez and Iqbal Ahmed. Mr. Revolorio has performed three inspections of all five IRWD dams and has worked closely with IRWD staff in the past 2 years. Mr. Sanchez has performed numerous dam safety related inspections and assessments regarding IRWD's dams during his career at DSOD, as Southern Regional and Area Engineer, and currently at GEI. The dam inspection items will include but not limited to the following:

- Dam crest: alignment, erosion, ruts or depressions, settlement/sinkholes, cracks, excessive vegetation, freeboard, crest surface condition
- Upstream slope: slope protection, erosion, cracking, inclination, excessive vegetation, sloughing/instability, rodent activity
- Downstream slope: slope protection, seepage, erosion, cracking, inclination, excessive vegetation, sloughing/instability, rodent activity
- Instrumentation: reliability, performance, calibration, collected data
- Animal burrows in embankment
- Abutments: seepage, erosion, excessive vegetation, sinkholes/depressions, sloughing/instability
- Downstream toe: seepage, soft areas, excessive vegetation, sloughing/instability
- Spillway: blockage from vegetation/debris, corrosion/spalling, sediment, gate controls, drains/weepholes, joints, movement, structural integrity
- Inlet/outlet works: valve/gate operation/controls, corrosion, blockage from vegetation/debris, structural integrity, hydraulic fluid leakage
- Spillway structural integrity, concrete surfaces, leakage, joint condition, operations, vegetation, drain holes
- Reservoir perimeter: erosion, inclination, sloughing/instability, landslides

A Dam Safety Inspection Checklist will be used to rapidly document dam safety inspections. A sample checklist is included in **Appendix A**. The checklist will be catered to each dam, as appropriate. Dam conditions will be documented using photographs and videos using a specially equipped field iPad with LiDAR capabilities. GEI will use this field iPad to create Google Earth files with georeferenced pictures of inspection items for each dam. A Google Earth KMZ file will be provided to IRWD to aid their Operations and Maintenance (O&M) staff with inspection items. We will also evaluate all the instrumentation at the dams to verify they are properly maintained and protected, and we will take actual measurements of these instruments, when possible, to verify functionality.

Information on each dam will be reviewed prior to conducting the field inspection. From our experience with monitoring and inspecting IRWD's dams from past years, GEI already has extensive familiarity and information on each dam, such as construction plans and specifications, geotechnical reports, dam improvement and repair documents, and past inspection reports. We have assumed that IRWD will provide other more recent available information on each dam that updates our available information. The existing information will be used to identify special areas of concern, and to allow for a more efficient inspection process. GEI field observations and a review of the instrumentation data will be compared against those contained in previous inspection reports to assess whether changes appear to be occurring that might impact dam safety.

### **Task 3 – Reporting**

#### ***Annual Reports***

GEI will prepare an annual report for each of the five dams to summarize the surveillance and monitoring of each dam. The reports will include selected plans and sections of each dam showing major features, including piezometers, surface crest monuments and seepage monitoring points. They will incorporate GEI's graphical plots of water surface elevations, piezometer levels, seepage flow rates and surface monument movement.

The reports will summarize analyses of the instrumentation data and the results of field inspection observations. The reports will include conclusions, recommendations, and corrective actions relative to the safety and stability of each dam. The reports will also include the individual memoranda identified under Task 1 to ensure a single source of information for the year of reporting. Reports will be prepared in a form acceptable to both IRWD and DSOD. GEI is known for the preparation of well written reports, with clearly prepared figures and tables to convey findings, results, and recommendations. We have prepared similar monitoring and surveillance reports for many dam owners in California. Examples are the reports that GEI has prepared for IRWD under their 5-Year Dam Monitoring and Surveillance contract.

GEI will provide a OneDrive link with PDF copies of the report for each dam to IRWD for review within six weeks following the end of each calendar year. A final report will be prepared after addressing one round of IRWD comments. We understand that IRWD will submit copies of the final reports to DSOD for review.

### **Task 4 – MWRP Floodwall Inspection & Evaluation**

GEI will conduct an annual visual inspection of the MWRP and SJMC Berm and Floodwall on an agreed upon date with IRWD. Field notes, measurements, and photographs will be taken during the inspection. GEI will inspect the masonry floodwalls, perimeter flood earthfill berms around the MWRP and SJMC, the vegetation (trees and overgrown brush) on these same berms, floodwall gate openings, cracks or separation on the floodwalls, condition of joint sealant along the floodwall joints, any scoured areas of the berm, and visual inspection of the San Diego Creek earth levee sections that are part of the MWRP and SJMC Berm and Floodwall systems. GEI will also perform a visual inspection of the San Diego Creek earth levee from the pathway on Riparian View and report on its findings.

GEI will prepare a Technical Memorandum documenting the visual inspection of the MWRP and SJMC Berm and Floodwall and provide an assessment of these same facilities based on the inspection and information provided by IRWD. Engineering calculations, analysis, or designs are not included as part of this proposal.

GEI will provide a OneDrive link with a PDF copy of the report to IRWD for review within six weeks following the inspection. A final report will be prepared after addressing one round of IRWD comments.

### **Task 5 – Review of Dam Safety Program (DSP) Guidelines**

IRWD has recently developed DSP Guidelines as part of its commitment to maintaining the higher standards of dam safety. The guidelines consist of a comprehensive framework for assessing, monitoring, and managing dam safety risks. GEI will review the DSP and provide feedback based on our experiences

in industry and regulating agencies. GEI will integrate the DSP guidelines into the annual inspections and reports.

GEI will summarize their review and feedback of the DSP in a technical memorandum and provide to IRWD within the first 6 months of the first calendar year.

### **Task 6 – Annual Spillway Inspection for Rattlesnake Canyon Dam and Sand Canyon Dam**

GEI will perform an annual spillway inspection for Rattlesnake Canyon Dam and Sand Canyon Dam during the planned annual dam inspections. Information specific to the spillway for these dams will be reviewed prior to performance of the first inspection. We have assumed that IRWD will provide available information for each spillway, such as construction plans, specifications, repair documents, and past inspection reports.

The inspection for each concrete spillway will be performed to document the spillway condition and to create a baseline condition for future inspections. The inspection will include detailed mapping of cracks, spalls, previous repairs, recommendations for vegetation removal, and other spillway defects. A two-person team consisting of GEI staff engineers will perform the baseline and annual spillway inspections.

The results of the spillway inspection will be documented in an exhibit/map (drawing) outlining the cracks, spalls, vegetation, or other defects observed during the inspection that require repair or action. GEI will provide a OneDrive link with a PDF copy of the drawing to IRWD for review within six weeks following the inspection. A final drawing will be prepared after addressing one round of IRWD comments. The drawing will be included in the appendices of the Dam Annual Surveillance Report for Rattlesnake Canyon and Sand Canyon dams.

#### **Deliverables:**

- Exhibit/map (drawing)

### **Task 7 – As-Needed Services**

GEI will provide dam engineering and emergency response assistance to IRWD on an as-needed basis. GEI can respond immediately to emergency situations and can have key personnel at any of the dam sites within about one hour.

GEI's as-needed dam engineering experience covers the entire range of activities pertinent to dam design, safety evaluation, and rehabilitation. This includes inspections, siting studies, geotechnical investigations, feasibility level designs, permitting, final designs, preparation of plans and specifications, construction inspections, hydrology and hydraulic studies, dam failure evaluations, analyses of seepage, stability, and seismic behavior, providing support for troubleshooting dam monitoring instrumentation, borrow studies, laboratory testing and analyses, and facilitating additional coordination with the DSOD.

## Schedule

GEI’s current and planned workload, and that of our key personnel, is such that we can easily complete all of the required work within the schedule established by IRWD. We have included **Table 2** below that provides staff availability for the duration of this contract.

**TABLE 2. STAFF PERCENT AVAILABILITY AND WORK TASK INVOLVEMENT**

Staff	Role	Availability
Richard Sanchez	Project Manager	15%
Emerson Revolorio	Project Engineer/Dam Inspector	55%
Iqbal Ahmed	Technical Advisor	5%
Lorena Manriquez	Quality Control	5%
Kody Vandervort	Instrumentation Plots/Inspector	20%
Benjamin Emery	As-needed Engineering Support	25%

# Budget



September 6, 2023 (revised October 2, 2023)

Consulting  
Engineers and  
Scientists

Mr. Jacob J. Moeder, P.E.  
Engineering Manager – Dams & Storage  
Irvine Ranch Water District  
15600 Sand Canyon Avenue  
Irvine, CA 92618

**Subject: Cost Proposal for Annual Dam Surveillance Reports**

Dear Mr. Moeder:

GEI Consultants, Inc. (GEI) has prepared the enclosed cost proposal to provide Irvine Ranch Water District (IRWD) with engineering services for a three-year monitoring and surveillance program for San Joaquin Dam, Sand Canyon Dam, Syphon Dam, Rattlesnake Dam, Santiago Creek Dam, and Michelson Water Recycling Plant (MWRP) Floodwall and Berm.

Please contact Rich Sanchez at 916.350.1769 or [rsanchez@geiconsultants.com](mailto:rsanchez@geiconsultants.com), or Emerson Revolorio at 760.795.1964 or [erevolorio@geiconsultants.com](mailto:erevolorio@geiconsultants.com) if there are any questions regarding our proposal.

Sincerely,

**GEI Consultants, Inc.**

A blue ink signature of Richard Sanchez, consisting of stylized, overlapping letters.

Richard Sanchez, P.E.  
Vice President/Project Manager

A blue ink signature of Emerson Revolorio, written in a cursive style.

Emerson Revolorio, P.E.  
Project Engineer

**TABLE 1**  
**GEI CONSULTANTS, INC. FEE ESTIMATE - YEARS 2024,**  
**2025, 2026**  
**Three-Year Dam Monitoring and Surveillance Program**  
**Irvine Ranch Water District**

Item	Year			Total
	2024	2025	2026	
Rattlesnake Canyon Dam	\$ 11,182.00	\$ 10,388.00	\$ 10,388.00	\$ 31,958.00
Sand Canyon Dam	\$ 11,182.00	\$ 10,388.00	\$ 10,388.00	\$ 31,958.00
San Joaquin Dam	\$ 14,716.00	\$ 13,922.00	\$ 13,922.00	\$ 42,560.00
Syphon Dam	\$ 10,388.00	\$ 10,388.00	\$ 10,388.00	\$ 31,164.00
Santiago Creek Dam	\$ 11,182.00	\$ 10,388.00	\$ 10,388.00	\$ 31,958.00
MWRP Floodwall	\$ 8,369.00	\$ 8,369.00	\$ 8,369.00	\$ 25,107.00
Dam Safety Program Guidelines	\$ 14,278.00	\$ -	\$ -	\$ 14,278.00
Annual Spillway Inspections	\$ 11,100.00	\$ 8,998.00	\$ 8,998.00	\$ 29,096.00
As-Needed Services	\$ 14,944.00	\$ 14,944.00	\$ 14,944.00	\$ 44,832.00
<b>Totals</b>	<b>\$ 107,341.00</b>	<b>\$ 87,785.00</b>	<b>\$ 87,785.00</b>	<b>\$ 282,911.00</b>

**TABLE 2**  
**GEI CONSULTANTS, INC. FEE ESTIMATE - YEAR 2024**  
**Three-Year Dam Monitoring and Surveillance Program**  
**Irvine Ranch Water District**

Cost Estimate	Staff	E Revolorio	I Ahmed	R Sanchez	L Manriquez	K Vandervort	B Emery			Subtotals		Expenses	Total Cost
	Project Engineer	Technical Advisor	Project Manager	QC Manager	Engineer	Staff Professional	Admin Support	CADD Operator	Hours	Cost	Subs		
	Grade 5 \$226.00	Grade 8 \$342.00	Grade 8 \$342.00	Grade 6 \$257.00	Grade 3 \$171.00	Grade 2 \$156.00	\$127.00	\$156.00					
<b>Rattlesnake Canyon Dam</b>													
Data Plotting and Evaluation	6	0.25	0.25		11				17.5	\$ 3,408			\$ 3,408.00
Field Inspections	4		2		4				10	\$ 2,272			\$ 2,272.00
Report Preparation	12	2	2	2	2		2	2	24	\$ 5,502			\$ 5,502.00
									0	\$ -			\$ -
<b>TASK 1 SUBTOTAL</b>	<b>22</b>	<b>2.25</b>	<b>4.25</b>	<b>2</b>	<b>17</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>51.5</b>	<b>\$ 11,182</b>	<b>\$ -</b>		<b>\$ 11,182.00</b>
<b>Sand Canyon Dam</b>													
Data Plotting and Evaluation	6	0.25	0.25		11				17.5	\$ 3,408			\$ 3,408.00
Field Inspections	4		2		4				10	\$ 2,272			\$ 2,272.00
Report Preparation	12	2	2	2	2		2	2	24	\$ 5,502			\$ 5,502.00
									0	\$ -			\$ -
<b>TASK 2 SUBTOTAL</b>	<b>22</b>	<b>2.25</b>	<b>4.25</b>	<b>2</b>	<b>17</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>51.5</b>	<b>\$ 11,182</b>	<b>\$ -</b>		<b>\$ 11,182.00</b>
<b>San Joaquin Dam</b>													
Data Plotting and Evaluation	8	0.25	0.25		11				19.5	\$ 3,860			\$ 3,860.00
Field Inspections	4		2		4				10	\$ 2,272			\$ 2,272.00
Report Preparation	12	2	2	2	2		2	2	24	\$ 5,502			\$ 5,502.00
Sediment Lab Analysis	2		1		8				11	\$ 2,162	\$ 920.00		\$ 3,082.00
<b>TASK 3 SUBTOTAL</b>	<b>26</b>	<b>2.25</b>	<b>5.25</b>	<b>2</b>	<b>25</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>64.5</b>	<b>\$ 13,796</b>	<b>\$ 920.00</b>		<b>\$ 14,716.00</b>
<b>Syphon Dam</b>													
Data Plotting and Evaluation	4	0.25	0.25		9				13.5	\$ 2,614			\$ 2,614.00
Field Inspections	4		2		4				10	\$ 2,272			\$ 2,272.00
Report Preparation	12	2	2	2	2		2	2	24	\$ 5,502			\$ 5,502.00
									0	\$ -			\$ -
<b>TASK 4 SUBTOTAL</b>	<b>20</b>	<b>2.25</b>	<b>4.25</b>	<b>2</b>	<b>15</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>47.5</b>	<b>\$ 10,388</b>	<b>\$ -</b>		<b>\$ 10,388.00</b>
<b>Santiago Creek Dam</b>													
Data Plotting and Evaluation	6	0.25	0.25		11				17.5	\$ 3,408			\$ 3,408.00
Field Inspections	4		2		4				10	\$ 2,272			\$ 2,272.00
Report Preparation	12	2	2	2	2		2	2	24	\$ 5,502			\$ 5,502.00
									0	\$ -			\$ -
<b>TASK 5 SUBTOTAL</b>	<b>22</b>	<b>2.25</b>	<b>4.25</b>	<b>2</b>	<b>17</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>51.5</b>	<b>\$ 11,182</b>	<b>\$ -</b>		<b>\$ 11,182.00</b>
<b>MWRP Floodwall</b>													
Inspection	6		6						12	\$ 3,408			\$ 3,408.00
Report Preparation	12		2	1	4	4			23	\$ 4,961			\$ 4,961.00
									0	\$ -			\$ -
									0	\$ -			\$ -
<b>TASK 6 SUBTOTAL</b>	<b>18</b>	<b>0</b>	<b>8</b>	<b>1</b>	<b>4</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>35</b>	<b>\$ 8,369</b>	<b>\$ -</b>		<b>\$ 8,369.00</b>
<b>Dam Safety Program Guidelines</b>													
Review	12	4	8		4				28	\$ 7,500			\$ 7,500.00
Report Preparation	16	2	4	2	2		2		28	\$ 6,778			\$ 6,778.00
									0	\$ -			\$ -
									0	\$ -			\$ -
<b>TASK 7 SUBTOTAL</b>	<b>28</b>	<b>6</b>	<b>12</b>	<b>2</b>	<b>6</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>56</b>	<b>\$ 14,278</b>	<b>\$ -</b>		<b>\$ 14,278.00</b>
<b>Annual Spillway Inspection for Rattlesnake Canyon Dam and Sand Canyon Dam</b>													
Documentation Review	2		2				2		6	\$ 1,448			\$ 1,448.00
Field Inspections	12		12						24	\$ 6,816			\$ 6,816.00
Exhibit Preparation	4		2				4	4	14	\$ 2,836			\$ 2,836.00
									0	\$ -			\$ -
<b>TASK 8 SUBTOTAL</b>	<b>18</b>	<b>0</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>4</b>	<b>44</b>	<b>\$ 11,100</b>	<b>\$ -</b>		<b>\$ 11,100.00</b>
<b>As Needed Support</b>													
Engineering Assistance	20	8	6	4	16	8		4	66	\$ 14,944			\$ 14,944.00
									0	\$ -			\$ -
									0	\$ -			\$ -
									0	\$ -			\$ -
<b>TASK 9 SUBTOTAL</b>	<b>20</b>	<b>8</b>	<b>6</b>	<b>4</b>	<b>16</b>	<b>8</b>	<b>0</b>	<b>4</b>	<b>66</b>	<b>\$ 14,944</b>	<b>\$ -</b>		<b>\$ 14,944.00</b>
<b>PROJECT TOTALS</b>	<b>196</b>	<b>25.25</b>	<b>64.25</b>	<b>17</b>	<b>117</b>	<b>18</b>	<b>12</b>	<b>18</b>	<b>467.5</b>	<b>\$ 106,421</b>	<b>\$ 920</b>		<b>\$ 107,341</b>

Notes:

1) Other GEI personnel will support the project as needed. Key personnel will not be reassigned without prior written approval by IRWD.

**TABLE 3**  
**GEI CONSULTANTS, INC. FEE ESTIMATE - YEAR 2025**  
**Three-Year Dam Monitoring and Surveillance Program**  
**Irvine Ranch Water District**

Cost Estimate	Staff	E Revolorio	I Ahmed	R Sanchez	L Manriquez	K Vandervort	B Emery			Subtotals		Expenses	Total Cost
	Project Engineer	Technical Advisor	Project Manager	QC Manager	Engineer	Staff Professional	Admin Support	CADD Operator	Hours	Cost	Subs		
	Grade 5 \$226.00	Grade 8 \$342.00	Grade 8 \$342.00	Grade 6 \$257.00	Grade 3 \$171.00	Grade 2 \$156.00	\$127.00	\$156.00					
<b>Rattlesnake Canyon Dam</b>													
Data Plotting and Evaluation	4	0.25	0.25		9				13.5	\$ 2,614			\$ 2,614.00
Field Inspections	4		2		4				10	\$ 2,272			\$ 2,272.00
Report Preparation	12	2	2	2	2		2	2	24	\$ 5,502			\$ 5,502.00
									0	\$ -			\$ -
<b>TASK 1 SUBTOTAL</b>	<b>20</b>	<b>2.25</b>	<b>4.25</b>	<b>2</b>	<b>15</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>47.5</b>	<b>\$ 10,388</b>	<b>\$ -</b>		<b>\$ 10,388.00</b>
<b>Sand Canyon Dam</b>													
Data Plotting and Evaluation	4	0.25	0.25		9				13.5	\$ 2,614			\$ 2,614.00
Field Inspections	4		2		4				10	\$ 2,272			\$ 2,272.00
Report Preparation	12	2	2	2	2		2	2	24	\$ 5,502			\$ 5,502.00
									0	\$ -			\$ -
<b>TASK 2 SUBTOTAL</b>	<b>20</b>	<b>2.25</b>	<b>4.25</b>	<b>2</b>	<b>15</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>47.5</b>	<b>\$ 10,388</b>	<b>\$ -</b>		<b>\$ 10,388.00</b>
<b>San Joaquin Dam</b>													
Data Plotting and Evaluation	6	0.25	0.25		9				15.5	\$ 3,066			\$ 3,066.00
Field Inspections	4		2		4				10	\$ 2,272			\$ 2,272.00
Report Preparation	12	2	2	2	2		2	2	24	\$ 5,502			\$ 5,502.00
Sediment Lab Analysis	2		1		8				11	\$ 2,162	\$ 920.00		\$ 3,082.00
<b>TASK 3 SUBTOTAL</b>	<b>24</b>	<b>2.25</b>	<b>5.25</b>	<b>2</b>	<b>23</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>60.5</b>	<b>\$ 13,002</b>	<b>\$ 920.00</b>		<b>\$ 13,922.00</b>
<b>Syphon Dam</b>													
Data Plotting and Evaluation	4	0.25	0.25		9				13.5	\$ 2,614			\$ 2,614.00
Field Inspections	4		2		4				10	\$ 2,272			\$ 2,272.00
Report Preparation	12	2	2	2	2		2	2	24	\$ 5,502			\$ 5,502.00
									0	\$ -			\$ -
<b>TASK 4 SUBTOTAL</b>	<b>20</b>	<b>2.25</b>	<b>4.25</b>	<b>2</b>	<b>15</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>47.5</b>	<b>\$ 10,388</b>	<b>\$ -</b>		<b>\$ 10,388.00</b>
<b>Santiago Creek Dam</b>													
Data Plotting and Evaluation	4	0.25	0.25		9				13.5	\$ 2,614			\$ 2,614.00
Field Inspections	4		2		4				10	\$ 2,272			\$ 2,272.00
Report Preparation	12	2	2	2	2		2	2	24	\$ 5,502			\$ 5,502.00
									0	\$ -			\$ -
<b>TASK 5 SUBTOTAL</b>	<b>20</b>	<b>2.25</b>	<b>4.25</b>	<b>2</b>	<b>15</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>47.5</b>	<b>\$ 10,388</b>	<b>\$ -</b>		<b>\$ 10,388.00</b>
<b>MWRP Floodwall</b>													
Inspection	6		6						12	\$ 3,408			\$ 3,408.00
Report Preparation	12		2	1	4	4			23	\$ 4,961			\$ 4,961.00
									0	\$ -			\$ -
									0	\$ -			\$ -
<b>TASK 6 SUBTOTAL</b>	<b>18</b>	<b>0</b>	<b>8</b>	<b>1</b>	<b>4</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>35</b>	<b>\$ 8,369</b>	<b>\$ -</b>		<b>\$ 8,369.00</b>
<b>Annual Spillway Inspection for Rattlesnake Canyon Dam and Sand Canyon Dam</b>													
Field Inspections	12		12						24	\$ 6,816			\$ 6,816.00
Exhibit Preparation	4		1			4		2	11	\$ 2,182			\$ 2,182.00
									0	\$ -			\$ -
<b>TASK 8 SUBTOTAL</b>	<b>16</b>	<b>0</b>	<b>13</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>2</b>	<b>35</b>	<b>\$ 8,998</b>	<b>\$ -</b>		<b>\$ 8,998.00</b>
<b>As Needed Support</b>													
Engineering Assistance	20	8	6	4	16	8		4	66	\$ 14,944			\$ 14,944.00
									0	\$ -			\$ -
									0	\$ -			\$ -
									0	\$ -			\$ -
<b>TASK 9 SUBTOTAL</b>	<b>20</b>	<b>8</b>	<b>6</b>	<b>4</b>	<b>16</b>	<b>8</b>	<b>0</b>	<b>4</b>	<b>66</b>	<b>\$ 14,944</b>	<b>\$ -</b>		<b>\$ 14,944.00</b>
<b>PROJECT TOTALS</b>	<b>158</b>	<b>19.25</b>	<b>49.25</b>	<b>15</b>	<b>103</b>	<b>16</b>	<b>10</b>	<b>16</b>	<b>386.5</b>	<b>\$ 86,865.00</b>	<b>\$ 920</b>		<b>\$ 87,785</b>

Notes:  
1) Other GEI personnel will support the project as needed. Key personnel will not be reassigned without prior written approval by IRWD.

**TABLE 4**  
**GEI CONSULTANTS, INC. FEE ESTIMATE - YEAR 2026**  
**Three-Year Dam Monitoring and Surveillance Program**  
**Irvine Ranch Water District**

Cost Estimate	Staff	E Revolorio	I Ahmed	R Sanchez	L Manriquez	K Vandervort	B Emery			Subtotals		Expenses	Total Cost
	Project Engineer	Technical Advisor	Project Manager	QC Manager	Engineer	Staff Professional	Admin Support	CADD Operator	Hours	Cost	Subs		
	Grade 5 \$226.00	Grade 8 \$342.00	Grade 8 \$342.00	Grade 6 \$257.00	Grade 3 \$171.00	Grade 2 \$156.00							
<b>Rattlesnake Canyon Dam</b>													
Data Plotting and Evaluation	4	0.25	0.25			9			13.5	\$ 2,614			\$ 2,614.00
Field Inspections	4		2			4			10	\$ 2,272			\$ 2,272.00
Report Preparation	12	2	2	2		2		2	24	\$ 5,502			\$ 5,502.00
									0	\$ -			\$ -
<b>TASK 1 SUBTOTAL</b>	<b>20</b>	<b>2.25</b>	<b>4.25</b>	<b>2</b>		<b>15</b>	<b>0</b>	<b>2</b>	<b>47.5</b>	<b>\$ 10,388</b>	<b>\$ -</b>		<b>\$ 10,388.00</b>
<b>Sand Canyon Dam</b>													
Data Plotting and Evaluation	4	0.25	0.25			9			13.5	\$ 2,614			\$ 2,614.00
Field Inspections	4		2			4			10	\$ 2,272			\$ 2,272.00
Report Preparation	12	2	2	2		2		2	24	\$ 5,502			\$ 5,502.00
									0	\$ -			\$ -
<b>TASK 2 SUBTOTAL</b>	<b>20</b>	<b>2.25</b>	<b>4.25</b>	<b>2</b>		<b>15</b>	<b>0</b>	<b>2</b>	<b>47.5</b>	<b>\$ 10,388</b>	<b>\$ -</b>		<b>\$ 10,388.00</b>
<b>San Joaquin Dam</b>													
Data Plotting and Evaluation	6	0.25	0.25			9			15.5	\$ 3,066			\$ 3,066.00
Field Inspections	4		2			4			10	\$ 2,272			\$ 2,272.00
Report Preparation	12	2	2	2		2		2	24	\$ 5,502			\$ 5,502.00
Sediment Lab Analysis	2		1			8			11	\$ 2,162	\$ 920.00		\$ 3,082.00
<b>TASK 3 SUBTOTAL</b>	<b>24</b>	<b>2.25</b>	<b>5.25</b>	<b>2</b>		<b>23</b>	<b>0</b>	<b>2</b>	<b>60.5</b>	<b>\$ 13,002</b>	<b>\$ 920.00</b>		<b>\$ 13,922.00</b>
<b>Syphon Dam</b>													
Data Plotting and Evaluation	4	0.25	0.25			9			13.5	\$ 2,614			\$ 2,614.00
Field Inspections	4		2			4			10	\$ 2,272			\$ 2,272.00
Report Preparation	12	2	2	2		2		2	24	\$ 5,502			\$ 5,502.00
									0	\$ -			\$ -
<b>TASK 4 SUBTOTAL</b>	<b>20</b>	<b>2.25</b>	<b>4.25</b>	<b>2</b>		<b>15</b>	<b>0</b>	<b>2</b>	<b>47.5</b>	<b>\$ 10,388</b>	<b>\$ -</b>		<b>\$ 10,388.00</b>
<b>Santiago Creek Dam</b>													
Data Plotting and Evaluation	4	0.25	0.25			9			13.5	\$ 2,614			\$ 2,614.00
Field Inspections	4		2			4			10	\$ 2,272			\$ 2,272.00
Report Preparation	12	2	2	2		2		2	24	\$ 5,502			\$ 5,502.00
									0	\$ -			\$ -
<b>TASK 5 SUBTOTAL</b>	<b>20</b>	<b>2.25</b>	<b>4.25</b>	<b>2</b>		<b>15</b>	<b>0</b>	<b>2</b>	<b>47.5</b>	<b>\$ 10,388</b>	<b>\$ -</b>		<b>\$ 10,388.00</b>
<b>MWRP Floodwall</b>													
Inspection	6		6						12	\$ 3,408			\$ 3,408.00
Report Preparation	12		2	1		4	4		23	\$ 4,961			\$ 4,961.00
									0	\$ -			\$ -
									0	\$ -			\$ -
<b>TASK 6 SUBTOTAL</b>	<b>18</b>	<b>0</b>	<b>8</b>	<b>1</b>		<b>4</b>	<b>4</b>	<b>0</b>	<b>35</b>	<b>\$ 8,369</b>	<b>\$ -</b>		<b>\$ 8,369.00</b>
<b>Annual Spillway Inspection for Rattlesnake Canyon Dam and Sand Canyon Dam</b>													
Field Inspections	12		12						24	\$ 6,816			\$ 6,816.00
Exhibit Preparation	4		1				4	2	11	\$ 2,182			\$ 2,182.00
									0	\$ -			\$ -
<b>TASK 8 SUBTOTAL</b>	<b>16</b>	<b>0</b>	<b>13</b>	<b>0</b>		<b>0</b>	<b>4</b>	<b>0</b>	<b>35</b>	<b>\$ 8,998</b>	<b>\$ -</b>		<b>\$ 8,998.00</b>
<b>As Needed Support</b>													
Engineering Assistance	20	8	6	4		16	8		66	\$ 14,944			\$ 14,944.00
									0	\$ -			\$ -
									0	\$ -			\$ -
									0	\$ -			\$ -
<b>TASK 9 SUBTOTAL</b>	<b>20</b>	<b>8</b>	<b>6</b>	<b>4</b>		<b>16</b>	<b>8</b>	<b>0</b>	<b>66</b>	<b>\$ 14,944</b>	<b>\$ -</b>		<b>\$ 14,944.00</b>
<b>PROJECT TOTALS</b>	<b>158</b>	<b>19.25</b>	<b>49.25</b>	<b>15</b>		<b>103</b>	<b>16</b>	<b>10</b>	<b>386.5</b>	<b>\$ 86,865.00</b>	<b>\$ 920</b>		<b>\$ 87,785</b>

Notes:  
1) Other GEI personnel will support the project as needed. Key personnel will not be reassigned without prior written approval by IRWD.

**FEE SCHEDULE**

<u>Personnel Category</u>	<i>Hourly Billing Rate</i> <u>\$ per hour</u>
Staff Professional – Grade 1	\$ 141
Staff Professional – Grade 2	\$ 156
Project Professional – Grade 3	\$ 171
Project Professional – Grade 4	\$ 191
Senior Professional – Grade 5	\$ 226
Senior Professional – Grade 6	\$ 257
Senior Professional – Grade 7	\$ 306
Senior Consultant – Grade 8	\$ 342
Senior Consultant – Grade 9	\$ 417
Senior Principal – Grade 10	\$ 417
-----	
Senior Drafter and Designer	\$ 171
Drafter / Designer and Senior Technician	\$ 156
Field Professional	\$ 128
Technician, Word Processor, Administrative Staff	\$ 127
Office Aide	\$ 99

**PAYMENT TERMS**


Invoices will be submitted monthly or upon completion of a specified scope of service, as described in the accompanying contract (proposal, project, or agreement document that is signed and dated by GEI and CLIENT).

Payment is due upon receipt of the invoice. Interest will accrue at the rate of 1% of the invoice amount per month, for amounts that remain unpaid more than 30 days after the invoice date. All payments will be made by either check or electronic transfer to the address specified by GEI and will include reference to GEI's invoice number.

October 16, 2023

Prepared by: S. Choi

Submitted by: K. Burton

Approved by: Paul A. Cook 

## ENGINEERING AND OPERATIONS COMMITTEE

### SECURITY SERVICES AGREEMENT

#### SUMMARY:

The safety and security of IRWD properties and people is critical for the continuity of operations of the District. As such, multiple layers of security have been implemented, including access control to facilities, perimeter fencing and gates, CCTV monitoring, and security guard and patrol services. The current agreement for security guard and patrol services will soon be expiring and staff recommends that the Board authorize the General Manager to execute a Security Services Agreement with Securitas Security Services, Inc. for a three-year term ending in 2026 in the amount of \$3,048,196.86 with an option for two, one-year extensions.

#### BACKGROUND:

In April 2015, a Security and Vulnerability Assessment was conducted by TelSec, Inc. that identified security risks to IRWD facilities. Many of the recommendations from this report were implemented, including access control to IRWD facilities, securing the perimeter of IRWD facilities with fencing and locked gates, reconfiguring the lobbies of Sand Canyon Headquarters and the Operations Center, implementing CCTV cameras, and retaining security guard and patrol services. The addition of security guards and patrol services in 2017 also provided security support for special events, after-hours services for employees responding to various facility issues, and immediate response to security-related issues.

In March 2023, JL Group, Inc. was retained to conduct a comprehensive security staffing analysis and determine if the current number and deployment of security guards was appropriate to effectively safeguard IRWD employees and infrastructure. The analysis assessed:

- Expectations and duties performed by the security guards including patrol check mandates;
- Data captured when security guards scan Near Field Communication (NFC) tags located at their patrol routes to validate frequency of visits;
- Current security staffing model;
- Calls for service to District properties by law enforcement;
- Threat and vulnerability assessment reports relating to water infrastructure;
- Observations made during site visits;
- Employee survey data;
- Discussions with District management; and
- Interviews with current security guards.

Based on the findings of the analysis and staff review of the report, security patrol staffing levels will be slightly reduced, and the use of CCTV cameras will be expanded to implement a more optimized hybrid model of real-time detection and response.

Security Firm Selection Process:

In August 2023, staff issued an RFP for Security Guard Services to four firms: Securitas Security Services, Inc., Allied Universal Security Services, Star Pro Security, Inc., and PacWest Security Services. All but PacWest Security Services submitted proposals due to its inability to provide armed security services. Staff evaluated the proposals based on the content requirements, ability to provide armed security guards, ability to support special requests, ability to provide optional services such as 24/7 remote camera monitoring and other security-related technologies, and quality of references.

Allied and Securitas were ranked similarly based on their qualifications, but staff determined Securitas to be the best qualified due to the breadth of services provided including onsite, mobile, and remote guarding services. This includes a cost-effective technology package that allows for real-time remote camera monitoring that calls down to trespassers and notifies the security guard on duty to respond in a timely manner. As the current security services provider, Securitas has been very responsive and continuously demonstrates a high level of customer service to both IRWD employees and the customers it serves. The consultant evaluation matrix is attached as Exhibit "A", and Securitas' proposal is attached as Exhibit "B".

FISCAL IMPACTS:

Funding for Security Guard Services is included in the FY 2023-24 and FY 2024-25 Operating Budget.

ENVIRONMENTAL COMPLIANCE:

This project is not subject to the California Environmental Quality Act (CEQA).

RECOMMENDATION:

That the Board authorize the General Manager to execute a Security Services Agreement with Securitas Security Services, Inc. to provide security guard services for a three-year term ending 2026 in the amount of \$3,048,196.86 with an option for two, one-year extensions.

LIST OF EXHIBITS:

Exhibit "A" – Security Services Selection Matrix

Exhibit "B" – Securitas Security Services, Inc. Proposal



Exhibit "A"  
Security Services Selection Matrix

	Weight	Allied Universal	Star Pro	Securitas
Proposal Contents Met	30%	1	3	2
Ability to Provide Armed Officers	15%	2	3	1
Ability to Support Special Requests (e.g., special events, employee escorts, additional Security Office personnel for emergency service, etc.)	20%	2	3	1
Ability to Provide 24/7 Remote Camera Monitoring Services & other Security-Related Technologies	20%	2	3	1
Quality of References	15%	2	3	1
<i>Forced Ranking System:</i>				
<i>1- Best, 2- Second Best, etc.</i>				
Weighted Score		1.70	3.00	1.30
<b>FIRM RANKING</b>		<b>2</b>	<b>3</b>	<b>1</b>

**Proposed Fee**

	<b>Fee</b>	<b>Fee</b>	<b>Fee</b>
Year 1	\$1,233,009	\$944,862.50	\$970,298.28
Year 2	\$1,261,067	\$921,276	\$1,015,686.42
Year 2	\$1,289,426	\$943,324	\$1,062,212.16
<b>Total</b>	<b>\$3,783,502</b>	<b>\$2,809,462.50</b>	<b>\$3,048,196.86</b>

Note: This page is intentionally left blank.

Exhibit "B"

## Securitas Security Services USA, Inc

# A Security Program Solution for Irvine Ranch Water District

Jamar Austin, Area Vice President

(310) 678--0979 | [Corina.Ospina@Securitasinc.com](mailto:Corina.Ospina@Securitasinc.com)



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September 5, 2023

Irvine Ranch Water District  
Steve Choi  
3512 Michelson Drive  
Irvine, CA 92612

**Re: Security Service Proposal for IRWD**

Dear Mr. Choi,

Thank you for the opportunity to continue our security and safety partnerships. I understand the importance of selecting a dynamic solution-based security provider for your world class organization. Our operating efficiencies and technological advancements afford us the opportunity to provide best in class service and reliability. We are proud of our long-standing presence in the Orange County area. We feel confident that the enclosed proposal will demonstrate our value approach and capabilities

Our partnership over the last 6 years, in our opinion, and we hope you agree with our sentiment, has been one of mutual respect and appreciation. Recently, we've acquired Stanley Security, one of the largest Technology Security Companies. This enables us to continue to support and expand our technology service throughout your portfolio.

**Resources** – Securitas USA employs 15,000 thousand security officers in California. This allows us to have large contingency based support for future growth and or emergency needs. Our ability to immediately deploy strategic resources to your properties is unmatched for any, emergency or special event/temporary coverage requirements you may have.

**Experience** – Our local experience with sophisticated growing clients in this market has prepared us to give you the best possible service when it comes to the protection of your properties.

**Training** – Securitas USA provides each security officer with a clear training path. Our approach is based on three key perspectives. First, principles and techniques, such as those dealing with observation, safety, reporting, interpersonal relations, and Securitas USA policies. Secondly, individual clients such as yours may have unique situations that require additional specialized training. Therefore, we provide both general and client-specific training. Third, we meet the need for meaningful ongoing professional development to keep skills sharp through several innovative programs, which will continue to be developed into a site-specific curriculum by your Securitas District Manager.

These Securitas USA's strengths will help us provide you with the best service possible and the knowledge and commitment to maintain its quality level:

- We believe that Empowerment leads to Specialization in security expertise.
- Our District Managers are our security experts who become experts in your business.
- The Innovation of our technological offerings such as Securitas Connect helps us bridge our Innovation with your need for accountability and efficiency.
- Our ability to leverage partnerships result in unique value-added offerings.



Thank you for the opportunity to provide this proposal for the ultimate, professional security services. Please contact me if you have any questions or require further information. I look forward to speaking with you soon.

Sincerely,

A handwritten signature in black ink, consisting of a large loop followed by a horizontal stroke and a short vertical stroke at the end.

Jamar Austin, Area Vice President  
Securitas Security Services, USA



## Firm Overview

The parent company of Securitas USA is Securitas AB, the world's largest provider of security services. Securitas AB has three business segments: Security Services North America, Security Services Europe and Security Services Ibero-America. The publicly owned company is headquartered in Stockholm, Sweden has approximately 370,000 employees worldwide, with established operations in 48 markets with the ability to provide services in approximately 90 countries worldwide (<https://www.securitas.com/en/about-us/our-organization/>). Securitas AB has subsidiaries with business operations in North America, Europe, Latin America, the Middle East, Asia and Africa with 2020 revenues were \$13.17 billion. Our Headquarters is in Parsippany, New Jersey.

The security profession continues to expand, evolve, and diversify. At Securitas, we listen carefully to our clients to explore, discover and offer alternative methods for providing services and resources that enhance security, increase safety, improve efficiencies and result in cost savings. The Irvine Ranch Water District mission can be accomplished by leveraging the multiple services of Securitas Security Services USA, Inc. (Securitas).

As part of the leading international organization specializing in protective services based on people, technology and knowledge, Securitas offers a full spectrum of security services under the banner of **Securitas Protective Services**.

We are committed to providing security services for Irvine Ranch Water District, and to helping keep your people and property safe with a variety of tools. We feature The New Guarding with true solutions that create efficiency while saving both time and money.

Securitas understands the need to manage costs without compromising security. That's why we've developed The New Guarding, a three-dimensional approach to security. This innovative solution or any combination of On-site Guarding, Remote Guarding and Mobile Guarding provides the most efficient, cost-effective solution for your security requirements.

### Global Leader

We recognize that the primary objective of Irvine Ranch Water District is the selection of a security officer services provider. While Securitas' core competency is providing these services, we believe it also important to highlight our total solutions capabilities in order to demonstrate the value that Securitas will bring to Irvine Ranch Water District.

To make it as easy as possible for our clients, Securitas is now a single point of contact for their entire security solution. This includes On-site Guarding, Mobile Guarding, Remote Guarding, Electronic Security, Fire & Safety, and Corporate Risk Management – all offered by one company, a global leader in protective services, Securitas.

Securitas Protective Services offers:

- Security officers screened and trained to your requirements.
- The depth of knowledge and breadth of expertise you expect from your Protective Services partner.

### Local Focus

These services are managed by our geographic regions that guide and support our nearly 550 district managers and 90,000 security officers (123,000+ total employees). With district locations in every state, Securitas is by far the most locally-focused security company in the U.S.

Securitas is the only organization that offers this spectrum of guarding services and technology resources while providing a single point of contact for the client.

**Local Office** - Our Anaheim Office is the main office and primary location of our support services for IRWD. This Branch office will support our recruiting, hiring, and training efforts. Each of our District Managers in Anaheim operates with a dedicated operations team. They manage a portfolio of specific clients limited in size and specified by vertical market or geographic location. Setting up our business this way allows us to work closely with each client, listening carefully and then apply the





knowledge learned to create security alternatives that address the rising costs of the security profession. Securitas USA has 15 Offices in Southern California that will supports our Anaheim branch office.

## World Class

It is Securitas' ongoing goal to set the industry standard and continually raise the bar so that every employee, service and product surpass that standard for quality. To this end, we have implemented a comprehensive Total Quality Management approach. Measuring and improving client satisfaction is emphasized throughout our organization. To help ensure promised quality, annual quality assurance surveys, part of our Excellence in Service program are distributed from division level management.

We not only strive to solve your initial security issues, but also to leverage our knowledge to allow us to anticipate and prevent future exposures to your business risks. Pointing out issues is easy; preventing them, working with you proactively, will be our mission at Irvine Ranch Water District.

## Protective Service Offerings

Our goal is to drive efficiencies within a client's security program and offer solutions. Protective Services includes On-site Guarding, Mobile Guarding, Remote Guarding, Electronic Security, Fire & Safety, and Corporate Risk Management. All are offered by one company, Securitas, with a single point of contact.

### On-site Guarding

We know that every business environment has different security needs, which is why we have leveraged our knowledge and expertise to develop a variety of guarding functions to meet your requirements. After performing a Risk Assessment, we recommend services that best fit your situation. These include:

- Reception/concierge services
- Console operations
- Special event guarding
- Fire patrol and equipment checks
- Alarm and emergency response
- Facilities badging and identification services
- Transportation and parking coordination services
- Customized and site-specific security functions

Through **SecuritasConnect**, you can have full visibility and control over your security program. This is your window to view your site's security, at any time of the day or night. **SecuritasVision** saves time and confirms compliance of your security operations, policies and best practices, as well as improving communication and officer accountability.

### Mobile Guarding

Mobile Guarding allows sites of all sizes to have access to the world-class protection, high-caliber officers and advanced technologies that make Securitas the knowledge leader in security.

**Mobile Guarding Officers** - Specially-trained, vigilant and helpful officers check in at random but regimented times to fulfill post orders, inspect the property and assist staff as necessary.

**Alarm Response** - Mobile Guarding officers can respond to alarms and react with the appropriate response required by the situation.



## Remote Guarding

When you have Remote Guarding managed by Securitas, we act on incidents in real-time and can deter trouble before it happens. The combination of smart technology and our security expertise creates unprecedented efficiency to help protect your facility 24/7.

Real-time security programs are achieved when video cameras, video analytics, monitoring centers and security officers work together as one integrated force. Potential threats are spotted by cameras and automatically analyzed based on predefined criteria. When necessary, an operator is alerted who then takes immediate action to prevent or minimize damage. We continually identify areas for creating efficiencies both in preventing incidents and lowering resource demand.

**Alarm Verification** - Gives you the shortest possible response time when an incident occurs. Cameras will scan your premises and parking lots for unauthorized activity and potential threats, advise status and deliver an audible message that security is monitoring in real-time.

**Remote Employee Escort** - Utilizes live video surveillance with audio notification to provide a safe environment as employees arrive and depart the area. In other situations, we can monitor visitors who have access to a building and follow their progress throughout the building.

**Remote Entry/Exit Management** - Provides on-demand processing of employees and contract workers who require access to your facility. We can verify their identity, confirm authorization for entry/exit, track and record activity and report any exceptions.

**Remote Perimeter Protection** – Leverages customized intelligent video analytics for each unique location to recognize potential threats and alert operators the moment there is suspicious activity.

## Electronic Security

The advantage of working with Securitas is that you will have one point of contact for the design, installation and service of your equipment. Securitas gives you state-of-the-art security in innovative and cost-effective packages. Securitas Electronic Security Solutions provides a simple approach to your security system needs. We can:

- Help you understand how to best utilize your current system
- Update outdated or broken parts of the system
- Replace the system with a more efficient and effective design

Our engineers can provide expertise on Access Control, Video Security Solutions, Design and Installation, and Maintenance. Our Technology Service Centers (TSCs) are the hub of our technology activity. While technicians and service managers are deployed and ready to work across the country, the TSCs coordinate the activity to help provide quick action.

## Fire & Safety

We will work with you to develop a fire service plan to meet the specific needs of your facility. Certain industries that Securitas protects, such as the petrochemical, aerospace/defense, and energy industries, are more prone to fire hazards at their facilities. To strengthen our supportive relationship with these industries, we developed a specialized group to expertly fight fires, handle hazardous materials scenarios, and mitigate fire hazards that may threaten business operations.

Through Securitas Critical Infrastructure Services (SCIS), we bring you experience in assessing your facility and possible scenarios to find cost-effective ways to enhance the overall fire service program.

### Incident Response:

- Fire suppression
- Emergency medical response



- Rescue operations
- Arson investigation
- Confined space operations

#### Fire Prevention:

- Pre-development/fire pre-plans
- Uniform fire code enforcement
- Life safety code enforcement
- Public education programs

## Corporate Risk Management

Over 150 years, the Pinkerton name has evoked memories of America's first detective agency and the man who founded it - Allan Pinkerton. His legacy continues to this day with a force of Pinkerton investigators and security specialists who maintain the same reputable dedication and commitment to helping protect clients and their assets worldwide.

Pinkerton's tradition of excellence continues with the experience you can trust, and the integrity you can rely on which as a respected leader in the security consulting and investigation practice. Pinkerton offers organizations comprehensive security services, a consultative approach to identifying risks and the professional expertise to partner in effective solutions. With offices located in North America, Latin America, Europe and Asia, you can depend on an organization with a rich history and a dynamic future. Services include:

- Security consulting
- Corporate investigations
- Computer forensics
- Electronic discovery
- Executive protection
- Crisis management

## Integrated Guarding

We continually seek methods to meet each client's unique security requirements while keeping the client's business goals and budget in mind. We are dedicated to using our resources and experience to create security solutions that address the rising costs of the security profession.

Securitas Integrated Guarding balances the expertise and innovation of two or more core security services — On-site Guarding, Remote Guarding, Mobile Guarding and Electronic Security— to cater optimal protection to your organization and unique security needs.

Securitas' strong focus and commitment to Integrated Guarding solutions is demonstrated by our on-going investment in the growth and capabilities of our technology services and solutions support team. Through our coast-to-coast footprint, Securitas and its affiliates can offer an all-inclusive approach, and provide not just the officers and the technology, but a flexible security plan to handle all aspects of your organization's security objectives.

The benefits of Integrated Guarding include:

- Cost efficiencies without compromising your security program
- Flexibility with customized security solutions
- A single provider for all your security services



## Department of Homeland Security Designation (SAFETY Act)

After an extensive review by the Department of Homeland Security (DHS) of the service standards adopted and followed by Securitas Security Services USA, the DHS awarded Securitas and certain of its affiliates, Designation from the DHS on September 29, 2020, with an expiration date of September 30, 2025.

Congress passed the Support Anti-terrorism by Fostering Effective Technologies Act (SAFETY Act) as part of the Homeland Security Act of 2002 to encourage the developments of anti-terrorism products and services by limiting liability from claims brought as a result of a DHS-designated terrorist attack where approved anti-terror technology or services are deployed.

Briefly, here is what this protection means to our valued customers:

- When applicable, the SAFETY Act should extend the protection to all parties in the supply chain, including all of Securitas USA's government and private sector customers and subcontractors.

*\* For more information about the Department of Homeland Security and the SAFETY Act, visit <https://www.safetyact.gov/>*



## Company History

*Securitas Security Services USA, Inc. (Securitas) is the leading international company specialized in protective services based on people, technology, and knowledge. Securitas has over 550 district managers and employs approximately 123,000 people in North America. Securitas' revenues in 2020 were \$5.83 billion.*

### Overview

The parent company of Securitas USA is Securitas AB, the world's largest provider of security services. Securitas AB has three business segments: Security Services North America, Security Services Europe and Security Services Ibero-America. The publicly owned company is headquartered in Stockholm, Sweden has approximately 370,000 employees worldwide, with established operations in 48 markets with the ability to provide services in approximately 90 countries worldwide (<https://www.securitas.com/en/about-us/our-organization/>). Securitas AB has subsidiaries with business operations in North America, Europe, Latin America, the Middle East, Asia and Africa with 2020 revenues were \$13.17 billion.

### About Securitas AB

Securitas AB had a visionary approach to security. The company had high ideals and set the standards for quality, service and professionalism that revolutionized the field. In 1934, when Securitas AB's founder, Erik Philip-Sörensen, established the forerunner of Securitas AB, a private security firm in Helsingborg, Sweden, he created a model for Western Europe of how a guarding company should operate. He pioneered training and developed a cooperative effort with the fire department to ensure that his guards possessed firefighting skills. In the late 1940s, after the two world wars, the demand for more advanced security services increased. Securitas Alarm was formed to offer technology as a complement to the guarding services. In 1972, all of Philip-Sörensen's companies were combined under the collective name of Securitas AB, the Latin word for security. Securitas AB's high ethical nature is another distinguishing characteristic of the company.

The firm's core values are summarized in three words – Integrity, Vigilance and Helpfulness. These are the guiding principles for Securitas AB and subsidiary employees. A logo with three red dots, representing each of the values, was created. It became the recognized symbol for Securitas AB in Sweden, and later throughout the world.

### About Securitas Security Services USA, Inc.

In 1999, when Securitas AB entered the U.S. market by acquiring Pinkerton, the company became the largest security firm in the world. At the time, Securitas AB was already the leading protective services company in Europe, but few in America were aware of the firm's stature in the industry or the respect associated with its name.

Like Securitas AB, Pinkerton had a rich history dating back to 1850 in Chicago, when Allan Pinkerton, the "**original private eye**," founded the Pinkerton National Detective Agency. Pinkerton was employed to protect railroad property and first gained fame for exposing the activities of a band of counterfeiters. In 1861, he achieved national recognition when he uncovered and foiled a plot to assassinate Abraham Lincoln. Soon after the outbreak of the Civil War, Pinkerton helped organize a federal secret service, of which he became chief. His pursuits of notorious outlaws such as Jesse James, the Reno brothers and the Wild Bunch (a group of bandits led by Butch Cassidy and the Sundance Kid) brought extraordinary visibility to his agency.

In 2000, Securitas AB acquired the American private security firm, Burns International. Founded in 1909, the William J. Burns Detective Agency was also headquartered in Chicago. Burns was a man of integrity who had served as a national crime watchdog. During his career, he was known as "the greatest detective the U.S. had ever produced." In 1921, he was appointed director of the newly formed Bureau of Investigation that later became the FBI. Burns' drive, determination and commitment to service helped his company grow from a small detective agency to the second largest security provider in the U.S. That



same year, Securitas AB made a number of other U.S. acquisitions. First Security, American Protective Services, Doyle Protective Service, Smith Security, and APG Security were all purchased, giving the company a strong American foundation. The acquisitions also positioned Securitas USA as the market leader in the United States.

In July 2003, all the U.S. guarding operations of Securitas AB united under the single name of Securitas Security Services USA, Inc.

## Acquisition Timeline

### **FE Moran Security Solution 2020**

Securitas acquires FE Moran Security Solutions, a top 30 alarm monitoring and electronic security systems integration. The company will strengthen and complement Securitas' current alarm monitoring and electronic security.

### **Global Elite Group 2019**

Securitas acquires Global Elite Group is a leading security services provider to the aviation industry in the US. The company will strengthen and complement Securitas' current aviation organization in North America, and our combined network, footprint, licenses, and know-how will increase the value we bring to existing and new customers.

### **Kratos' Public Safety & Security Division 2018**

Securitas acquires Kratos which is to be combined with Securitas Electronic Security, Inc., aligns well with Securitas Electronic Security's current operations and strategic focus. The acquisition will expand Securitas' electronic security platform in the United States by strengthening field operation capabilities and adding local district infrastructure with highly skilled employees. It supports Securitas' strategy of providing protective services across the entire Securitas North American customer base and brings increased value to our customers.

### **Electronic Security 2015**

Securitas AB acquires the electronic assets of Diebold, a leader in electronic security. Its roots trace back to its founding in 1859 as a manufacturer of safes and vaults for banks. Diebold's North American Electronic Security business, based in Uniontown, OH, is the third largest commercial electronic security provider in North America. For more than 70 years, Diebold's North American Electronic Security business has brought together technology innovations, security expertise and quality services to become a leading provider of comprehensive electronic security solutions and services to business customers.

### **Remote Guarding by Securitas 2014**

Securitas purchases a quarter of Iverify, one of the leading remote video services organizations in the United States and operator of a state-of-the-art remote video operations monitoring center, the largest of its kind, headquartered in Charlotte, North Carolina.

### **Guarding by Securitas USA 2003**

All the U.S. guarding operations of Securitas AB are united under the single name of Securitas Security Services USA, Inc.

### **Security Officers 2000**

Securitas AB acquired the American private security firm, Burns International. Founded in 1909, the William J. Burns Detective Agency was also headquartered in Chicago. During his career, Burns was known as "the greatest detective the U.S. had ever produced." In 1921, he was appointed director of the newly formed Bureau of Investigation (FBI). Burns' drive, determination and commitment to service helped his company grow from a small detective agency to the second largest security provider in the U.S.



## Risk Management 1999

Securitas Acquires Pinkerton. Like Securitas AB, Pinkerton had a rich history dating back to 1850 in Chicago, when Allan Pinkerton, the “original private eye,” founded Pinkerton’s National Detective Agency. In 1861, he achieved national recognition when he uncovered and foiled a plot to assassinate Abraham Lincoln. Pinkerton helped organize a federal secret service, of which he became chief. Today, Pinkerton is the industry’s leading provider of risk management services.

## Past Experience

As demonstrated in this proposal, Securitas has the organizational capacity both accomplishing all the tasks specified in IRWD RFP. Having performed successfully on armed and unarmed contracts of similar size and scope, Securitas is the best and safest choice for IRWD to continue servicing this contract. All the experienced management and supporting team members are in place to successfully manage this contract.

An example of meeting the needs of the commission addressing tasks, when the LA County Sheriff’s awarded Securitas the Facilities and Healthcare contract, we only received a portion of the contract. It was their intention to have multiple primes on their contract to ensure success. When the other primes failed, the LA County Sheriffs asked Securitas to step in and take over the other portions of the contract. Ultimately, Securitas ended up servicing the entire contract. This included the most difficult sites to staff and supervise in the most remote parts of LA County.

Unlike other guard companies proposing their services, that will have to build an entirely new structure to support a contract of this size, Securitas is prepared from day one of the contract award. We have built a dedicated management team and support structure for this contract. There are many “guard companies”, but there are none that have the security resources of Securitas.

While this contract is just for security officers, you will find that is just one piece of the requirements to provide a secure environment at each of the IRWD facilities. Everyday our clients ask us to help them with additional security needs. The following is just some of our many security capabilities:

Most security companies in Southern California are having a difficult time hiring qualified security officers and are leaving their clients with numerous open posts. If you look at job posting ads for security officers in Orange County, you will typically find 20 to 30 companies advertising open positions. Smaller security companies desperately try to fill open posts. While finding qualified security officers is difficult, with an officer force of our size, we have the best manpower resources to fill those posts.

Securitas’ Service Delivery approach for this contract is based on our experience providing security service to similar contracts. Our history in servicing our clients, provides us with a strong working knowledge of the scope of work and contract. Additionally, our strong working relationship with the Public Safety Team makes Securitas the natural choice for this contract.



## Account Management

### Anthony Sanchez, Account Manager

The account manager interfaces with the security manager at Irvine Ranch Water District on security services delivery, and is responsible for all Securitas personnel and services at Irvine Ranch Water District. The account manager promotes teamwork, cooperation and consistency among shifts, and is fully trained and thoroughly knowledgeable of all post orders, operating logs, procedures, practices and site interior/exterior layout.

### Kery Velazquez, Shift Supervisor

Shift supervisors are responsible for the supervision of officers on their respective shifts. They build teamwork, cooperation and consistency on their shifts, and are fully trained and thoroughly knowledgeable of all post orders, operating logs, procedures, practices and site interior/exterior layout. They work under the direct supervision of a site manager, while working closely with Irvine Ranch Water District security management personnel.

### Jamar Austin, Area Vice President (AVP)

The AVP helps to ensure the delivery of high-quality client service through regular contact with clients, evaluates service quality, supports area and district offices in maintaining a consistent focus on high quality client service, and provides guidance in the retention of business. The AVP also assists in the orientation of area and district managers, helps to see that area offices and districts have well qualified individuals who are properly trained to carry out Securitas' mission, coaches area and district managers in strengthening their competencies and developing and retaining business, and facilitates teamwork and the implementation of progressive change.

### Jorge Moreno, District Manager

The district manager and primary point of contact person, actively manages all client sites in his/her area. The district manager facilitates decisions to meet the needs of Irvine Ranch Water District. The district manager meets regularly with the client contact at Irvine Ranch Water District to evaluate service levels, and implement and refine our ongoing service plan.

Some of the responsibilities of our district managers include:

**Client visits:** A Securitas district manager schedules regular visits with Irvine Ranch Water District to ensure contract compliance and satisfaction with our service.

**On-site training:** The district manager conducts both on-site and follow-up training in all basic and advanced security subjects as necessary.

**Maintaining contact:** District managers meet as necessary with client representatives to assist in performing the duties of our regular and special post orders.

**Site development:** District managers supervise, monitor and respond to security officers' requests for assistance, support and development. It is the responsibility of every district manager to strive to see that the security officers working at Irvine Ranch Water District have the skill sets, training, equipment, supplies and support necessary to fulfill their security responsibilities.

### Field Supervisors

Spearheading field supervision and training for each district office are the field supervisors, who function as non-resident supervisors. Field supervisors administer continuing training of the officers assigned to each facility. Since they are an





important extension of the management team, proper selection and training are important. We have developed formal programs that include seminars, classroom training, video instruction and manuals designed specifically for field supervisors. Some of the responsibilities of our field supervisors include:

**Field supervisor visits:** A Securitas supervisor schedules visits with each post, and monitors the quality of the security officers' performance and appearance.

**Field supervisor on-site training:** Field supervisors are available to conduct on-site and follow-up training in all security matters.

**Field supervisor contact:** Field supervisors meet frequently with a client representative to assist reviewing service levels.

**Inspection reports:** Field supervisors, when requested, inspect and leave reports on-site for the client's designated representative.

**Incident reports:** Field supervisors must respond to security officer requests for assistance and review each Incident Report. An "Action Taken Report" on the incident is left on-site for review by your management representative.

### Jessica Hendricks, Human Resources Manager

The human resources manager leads the hiring and selection process for all employees; personally interviews each candidate for selection to work at Irvine Ranch Water District; and manages benefits, employee relations and recruiting.

### Adriana Ponce, Recruiter

The recruiter actively promotes the employment opportunities at Securitas through numerous sources and works with state and local placement agencies to offer employment opportunities to qualified individuals. These sources include college and university groups, placement services and government agencies.

### Training Manager

The training manager guides the introduction process, site-specific training and continuous training program development; is responsible for the preparation of training materials, classroom presentation and site-specific training; reviews all operations at Irvine Ranch Water District to determine the best methods of delivering the training; identifies the appropriate training materials; schedules and conducts the training; and is responsible for supervisory and refresher training.

### Roberto Dominguez, Scheduling Manager

The scheduling manager ensures that all hours paid to the security officers balance with the invoice amounts billed to the client, tracks the hours billed to client specifications, and maintains client/employee data to ensure proper payroll and billing.

### Jacqueline Robles, Accounts Payable/Accounts Receivable

This individual works with the client representative when a billing discrepancy arises, researches any billing issues, and tracks timely payment of all outstanding invoices. District office payables and invoices are also processed for approval and payment.

### Flex Force

Securitas typically uses the flex force system to fill unscheduled vacancies (e.g., illness, vacation) at your facility. Additional officers are trained at each of our clients' sites to become fully knowledgeable of the required duties. They are on call 24 hours a day to be ready to respond to vacancies that may occur at your facility. Should the need arise for a large number of additional officers at a particular site, Securitas offices assist with a reserve force.



## Region Support Teams

Securitas consists of five geographic regions. The purpose of the region office is to guide and support the local district offices that, in turn, support our officers at client sites. Placing resources at the local level, where they can be used most effectively, is part of our mission as the industry leader to add value by being closer to our clients and to our security officers.

While supervisors are the first point of contact for the security officer, they will, on rare occasions, have questions that need to be escalated to the region level by their supervisors.

Securitas Pacific region support includes:

### John Campbell, Region President (RP)

The Region President is essentially the chief executive officer for the region, providing the leadership and vision that drives the quality of our service and promotes the success of the region. The RP directly oversees each of the area vice presidents in their support of the local district offices. The RP develops client relationships, grows Securitas' business, and studies the industry. RPs work to improve both the financial performance of the region, as well as the level of service the region provides to its clients and officers.

### David Gil, Region Vice President (RVP)

The RVP is responsible for initiating and maintaining professional-level contacts with prospective clients. The RVP carries the Securitas message to promote Securitas' reputation in the security industry and engage prospective clients, as well as looking for best operating practices and networking to identify prospective clients.

### Sarah Jingco, Vice President of Human Resources (VPHR)

This team member oversees all aspects of human resources for the region. The VPHR is the first point of contact for all benefits, compensation and general employee welfare questions that cannot be resolved by the district office. The VPHR works closely with corporate employee relations staff and is a key point of contact for government agencies. Compliance, standards and auditing of personnel records are additional areas of responsibility.

### Virginia Hidalgo, Regional Director of Training and Development (RDTD)

The RDTD not only delivers training, but also trains the trainers. The RDTD meets with clients to help identify training needs, listens to suggestions and oversees all employee development programs in the region. In addition, RDTDs promote career development, administer the sweepstakes coupon program, and support all aspects of the "Excellence in Service" program.

### Ian Macdonald, Region Controller (RC)

This individual reviews the financial status of every Securitas client, and prescribes corrective measures, when necessary, based on the findings. However, far more often the RC acts proactively to build and maintain a quality business portfolio, robust offices, and strong regions. Many of the questions asked are directly related to compensation. By working to improve Securitas' financial management, the region controller helps to support everyone at Securitas.

**Jorge Moreno**

District Manager, Securitas Security Services USA, Inc.

**Representative Assignments**

- District Manager, Securitas USA, Orange County Area, September 2006-Present
- Client Service Manager, Securitas USA, Paramount California, 1999-2006
- Field Supervisor, Securitas USA, Paramount California, 1997-1999
- Account Manager, Securitas USA, Torrance California, 1995-1997
- Security Officer, Securitas USA, Torrance California, 1994-1995

**Education/Training/Licensing**

- District Manager Training Program, Securitas USA, Orange California, 2003-2004
- Securitas Security Management Program (Levels 1-4)

**Professional Affiliations**

- American Society for Industrial Security (ASIS)
- Building and Office Management Association (BOMA)
- California Association of Community Managers (CACM)
- Community Associations Institute/ Orange County



## **Jamar Austin, Area Vice President**

Area Vice President, Securitas Security Services USA, Inc.

### **Experience Summary**

As Area Vice President, Jamar Austin oversees all operations for the Long Beach / South Bay / Orange County Area. Jamar has a proven track record of success and a dynamic leadership style where he has demonstrated the ability to develop strong relationships. Jamar brings over ten years of security management experience as he ensures that the Area and its Branch Offices maintain a consistent focus on quality services for each Client site. He also is involved deeply with the orientation of District Managers and ensures that they have qualified individuals who are properly trained to carry out the statement of work as outlined. He facilitates teamwork in all ways needed along with implementation of progressive change for continued betterment of service.

### **Representative Assignments**

- Area Vice President, Securitas Security Services USA, Long Beach/ Orange County
- District Manager, Securitas Security Services USA, San Francisco
- Account Manager, Securitas Security Services USA, Las Vegas
- Assistant Director, New York City

### **Education / Training / Licensing**

- Bachelor of Science, Business Administration, California Coast University
- Executive Leadership Program, University of Oxford
- Business Analytics Certificate, The Wharton School
- Emergency Management, Department of Homeland Security

**REQUEST FOR PROPOSAL**  
**2023 SECURITY GUARD SERVICES**  
**BID SHEET – YEAR 1**

Company Name: Securitas Security Services USA, Inc.

**Year 1 Security Guard Services**

Lump Sum Bid Amount: \$ 970,298.28 per year

To also include at a minimum:

Mid-Size SUV (Quantity: 3)

ATV (Quantity: 1)

Camera Equipment (Quantity: 7) & Remote Monitoring

**Officer**

Armed	<u>\$ 47.82</u> Regular	<u>\$ 64.23</u> OT	<u>\$ 47.82</u> Weekend	<u>\$ 64.23</u> Holiday
Unarmed	<u>\$ 31.20</u> Regular	<u>\$ 46.80</u> OT	<u>\$ 31.20</u> Weekend	<u>\$ 46.80</u> Holiday

**REQUEST FOR PROPOSAL**  
**2023 SECURITY GUARD SERVICES**  
**BID SHEET – YEAR 2**

Company Name: Securitas Security Services USA, Inc.

**Year 2 Security Guard Services**

Lump Sum Bid Amount: \$1,015,686.42 per year

To also include at a minimum:  
Mid-Size SUV (Quantity: 3)  
ATV (Quantity: 1)  
Camera Equipment (Quantity: 7) & Remote Monitoring

**Officer**

Armed	<u>\$49.90</u> Regular	<u>\$74.85</u> OT	<u>\$49.90</u> Weekend	<u>\$49.90</u> Holiday
Unarmed	<u>\$33.18</u> Regular	<u>\$49.77</u> OT	<u>\$33.18</u> Weekend	<u>\$49.77</u> Holiday

**REQUEST FOR PROPOSAL**  
**2023 SECURITY GUARD SERVICES**  
**BID SHEET – YEAR 3**

Company Name: Securitas Security Services USA, Inc.

**Year 3 Security Guard Services**

Lump Sum Bid Amount: \$ 1,062,212.16 per year

To also include at a minimum:  
Mid-Size SUV (Quantity: 3)  
ATV (Quantity: 1)  
Camera Equipment (Quantity: 7) & Remote Monitoring

**Officer**

Armed	<u>\$ 52.08</u> Regular	<u>\$ 78.12</u> OT	<u>\$ 52.08</u> Weekend	<u>\$ 78.12</u> Holiday
Unarmed	<u>\$ 35.42</u> Regular	<u>\$ 53.13</u> OT	<u>\$ 35.42</u> Weekend	<u>\$ 53.13</u> Holiday

**REQUEST FOR PROPOSAL**  
**2023 SECURITY GUARD SERVICES**  
**BID SHEET**


Company Name: Securitas Security Services USA, Inc.

Three-Year Grand Total Lump Sum Bid Amount: \$ 3,048,196.70  
(Sum of Year 1, 2, & 3)

**Bid Submitted by:**

Name: Jamar Austin

Title: Area Vice President

Signature: 

Date: 08/31/23





# Pricing

<b>YEAR 1</b>				
POSITION	Monthly Hours	Pay Rate	Bill Rate	Monthly Cost
Armed Officer	486	\$23.00	\$41.63	\$20,232.18
Account Manager	173	\$31.50	\$56.70	\$9,809.10
Armed Officer II	762	\$25.50	\$46.16	\$35,170.11
Unarmed Officer	242	\$20.00	\$31.20	\$7,550.40
Shift Supervisor	173	\$26.00	\$46.80	\$8,096.40

**\$80,858.19**

\$970,298.28 Annual

<b>YEAR 2</b>				
POSITION	Monthly Hours	Pay Rate	Bill Rate	Monthly Cost
Armed Officer	486	\$24.00	\$43.68	\$21,228.48
Account Manager	173	\$32.50	\$58.83	\$10,176.73
Armed Officer II	762	\$26.50	\$48.23	\$36,751.26
Unarmed Officer	242	\$21.00	\$33.18	\$8,029.56
Shift Supervisor	173	\$27.00	\$48.87	\$8,454.51

**\$84,640.54**

\$1,015,686.42 Annual

<b>YEAR 3</b>				
POSITION	Monthly Hours	Pay Rate	Bill Rate	Monthly Cost
Armed Officer	486	\$25.00	\$45.75	\$22,234.50
Account Manager	173	\$33.50	\$60.97	\$10,547.81
Armed Officer II	762	\$27.50	\$50.33	\$38,347.65
Unarmed Officer	242	\$22.00	\$35.42	\$8,571.64
Shift Supervisor	173	\$28.00	\$50.96	\$8,816.08

**\$88,517.68**

\$1,062,212.16 Annual

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