CALAVERAS COUNTY WATER DISTRICT
ENGINEERING COMMITTEE MEETING

OUR MISSION

Protect, enhance, and develop Calaveras County's water resources and watersheds to provide safe, reliable, and cost-effective services to our communities.

2021-2026 Strategic Plan, Adopted April 28, 2021, can be viewed at this link

Engineering Committee
Tuesday, July 2, 2024
2:00 p.m.

Calaveras County Water District
120 Toma Court
San Andreas, California 95249

Board Chambers are open to the public and the following alternative is available to members of the public who wish to participate in the meeting virtually:

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ORDER OF BUSINESS

CALL TO ORDER / PLEDGE OF ALLEGIANCE

1. ROLL CALL

2. PUBLIC COMMENT

COMMITTEE MEMBERS

Director Davidson, Chair Russ Thomas, Director

3. **APPROVAL OF MINUTES:** For the meeting of June 4, 2024

4. **NEW BUSINESS**

4a* Fire District Operations & Maintenance
(Damon Wyckoff, Director of Operations)

4b Construction Management for Copper Tanks Construction
(Kevin Williams, Senior Civil Engineer)

4c* Arnold WWTP Improvements Construction Funding Update
(Kevin Williams, Senior Civil Engineer)

4d La Contenta WWTP Improvements Engineering Design Consultant Selection
(Kevin Williams, Senior Civil Engineer)

4e AMI Project Additional Purchases
(Kevin Williams, Senior Civil Engineer)

4f Douds Fuel Break Project Update
(John Coleman, Water Resources Manager)

5. **OLD BUSINESS**

5a* Capital Improvement Updates
(Engineering Department)

5b* Other Updates
(Engineering Department)

6.* **GENERAL MANAGER COMMENTS**

7.* **DIRECTOR COMMENTS OR FUTURE AGENDA ITEMS**

8. **NEXT COMMITTEE MEETING:** September 3, 2024

9. **ADJOURNMENT**

*No information included in packet

CALAVERAS COUNTY WATER DISTRICT
SPECIAL ENGINEERING COMMITTEE

MINUTES
June 4, 2024

Directors/Committee Members present:

Russ Thomas
Jeff Davidson

Staff present:

Michael Minkler	General Manager
Mark Rincon-Ibarra	District Engineer
Bertha Underhill	Title*
Kevin Williams	Senior Civil Engineer
Sam Singh	Senior Engineering Technician
Jared Gravette	Senior Supervisor Construction Inspection
Juan Maya	Civil Engineer*
Haley Airola	Engineering Coordinator
Kelly Gerkensmeyer	External Affairs Manager
Pat Burkhardt	Construction/Maintenance Manger*
Stacey Lollar	Human resources Manager*
Kate Jesus	Human Resources Technician*
Rebecca Hitchcock	Executive Assistance/Clerk to the board*
Jason Knick	Construction Inspector
Jeff Meyer	Director of Administrative Services*
Bana Rousan-Gedese	Water Resource Specialist*
Tiffany Burke	Administrative Technician*
Kylie Muetterties	Accountant I*
Michael Bear	Accountant II*

Others present:

Mike Castro	Member of the Public
Denise Landstedt	Landstedt Consulting*
Jennifer Nevius	Landstedt Consulting*
Franscsio De La Cruz	Member of the Public*
Matt Ospital	WGA*

CALL TO ORDER / PLEDGE OF ALLEGIANCE.

1. ROLL CALL

Director Thomas called the Engineering Committee to order at 2:02 p.m. and led the Pledge of Allegiance.

*Attended virtually

2. PUBLIC COMMENT

No Comments from the Public

3. APPROVAL OF MINUTES

The April 9, 2024, minutes were approved by a motion from Director Davidson and seconded by Director Thomas, with correction of editing noted.

4. NEW BUSINESS

4a Grant Procurement Update-Landstedt Consulting (Mark Rincon-Ibarra, District Engineer)

DISCUSSION: Mark Rincon-Ibarra, District Engineer, introduced Denise Landstedt, Landstedt Consulting, and provided a summary of agreement in place with Landstedt Consulting. Denise presented a slideshow of Grants that the District may qualify for. Any questions from the Committee were answered directly by Denise Landstedt or Mark Rincon-Ibarra.

PUBLIC COMMENT: Public Comment was given by Francisco de la Cruz and Mike Castro

4b Construction Project Lookback (Kelly Gerkensmeyer, External Affairs Manager)

DISCUSSION: Kelly Gerkensmeyer, External Affairs Manager, presented a slideshow on the District's passed projects. All questions from the Committee were answered directly by Kelly.

PUBLIC COMMENT: Public Comment was given by Francisco de la Cruz and Mike Castro

4c O'Byrne's Ferry Pipeline Extension (Kevin Williams, Senior Civil Engineer)

DISCUSSION: Kevin Williams, Senior Civil Engineer, provided an update on the project and requested to present it to the full Board. Motioned by Director Davidson and seconded by President Thomas.

PUBLIC COMMENT: No public comment given.

4d Huckleberry Lift Station Update (Kevin Williams, Senior Civil Engineer)

DISUSSION: Kevin Williams, Senior Civil Engineer, provided an update on the recently received RFP's and requested to present to the full Board. Motioned by Director Davidson and Seconded by Present Thomas.

5. OLD BUSINESS

5a Capital Improvement Updates (Engineering Department)

DISCUSSION: The engineering department provided updates on all CIP projects. Any questions from the Committee were answered by the department.

PUBLIC COMMENT: No Public comment was given

5b Other Updates (Engineering Department)

DISCUSSION: The engineering department provided updates on other projects including developer driven projects. Any questions from the Committee were answered by the department.

PUBLIC COMMENT: Public comment was given by Fransico de la Cruz.

6. GENERAL MANAGER COMMENTS

None.

7. DIRECTOR COMMENTS OR FUTURE AGENDA ITEMS

Director Davidson spoke on the Jenny Lind A-B Transmissions Pipeline Townhall Meeting scheduled for June 4, 2024

8. NEXT COMMITTEE MEETING

July 2, 2024

9. ADJOURNMENT

There being no further business, the meeting adjourned at approximately 3:18 p.m.

Respectfully submitted,

_____

Haley Airola
Engineering Coordinator

Agenda Item

DATE: July 2, 2024

TO: Engineering Committee, Calaveras County Water District
Michael Minkler, General Manager

FROM: Damon Wyckoff, Director of Operations

SUBJECT: Discussion About the Collaboration Between CCWD and Fire Protection Districts Within Our Service Areas to Maintain Fire Hydrants.

RECOMMENDED ACTION: None. Informational Only

SUMMARY:

CCWD field staff spend a considerable effort working to improve the overall condition and operational effectiveness of the fire hydrants throughout the six separate distribution systems in Calaveras County. There are 2,265 fire hydrants throughout the service areas, and at print, there are thirteen hydrants out of service. This is an improvement over past conditions and a testament to the cooperation and Teamwork of the CCWD Distribution Crews and the Utility & Construction Crews.

The reduction in the number of out of service fire hydrants is the result of focused rehabilitation and improvement efforts that occur alongside competing system priorities like service lateral repair, uni-directional flushing, and Pressure Reducing Valve (PRV) maintenance. The objective for fire hydrant maintenance is that every year the fire departments inspect, grease and static pressure test Distribution System Fire hydrants. The Fire Departments then provide a report to CCWD that describes operational deficiencies (hard to turn stems, missing caps, etc.) and inoperable hydrants found during the inspection effort. Distribution Crew Leaders then work with the Construction & Maintenance Manager to develop a plan to restore the hydrants to service.

The planning and coordination effort between the Fire Departments, the Construction/Utility Crew, and the Distribution Crews often takes time. This is for multiple reasons. CCWDs Distribution Crews are understaffed. The District, inherently, runs lean. As such, hydrant rehab work requires the support of other field crews (usually the Construction or Utility) to muster the manpower to complete the hydrant repair work safely and effectively.

Most District fire hydrants do not have isolation valves (also called guard valves) on the hydrant runner (pipe from the water main to the fire hydrant). This eliminates any ability to isolate the fire hydrant for rehab work. Instead, the installation of an isolation valve must come first, or neighboring homeowners must endure a water outage while the

hydrant is being repaired. This is often the case in emergencies, as the District has little choice and must isolate the system to mitigate an emergency issue. But, when a shut down to repair a fire hydrant can impact hundreds if not thousands of people, it is best to install a valve as the first order of business. This work then provides the Distribution Crew with an improved time frame of repair for the hydrant as customers can be placed back into water while the CCWD Team repairs/replaces the hydrant, without impacting customers.

System staffing, the lack of isolation valves, and the inordinate amount of "other" system work is why some hydrants remained out of service over multiple years in the past and why, in some years, the number of out of service hydrants increased rather than decreased.

Moreover, as crews struggle to keep up with day-to-day work efforts, It is challenging to maintain a strong valve exercising program and, as a result, the number of broken and/or difficult to operate valves can increase over time. In recent years CCWD Distribution crews have focused a concerted effort in restoring valves to an acceptable operational condition (from routine, focused exercise or from scheduled replacement). This work has provided the District with the ability to rehabilitate and replace more out of service hydrants in recent years than in years past.

It should be highlighted that the good work our crews complete is also bolstered by the great inspection work our Fire District Partners complete on an annual basis. The Fire District's inspection work is critical in working to ensure the District is aware of the condition of its fire protection infrastructure. This work also helps less experienced Firefighters gain an understanding of the challenges and unique aspects of our Distribution Systems. To improve that understanding, the District has provided training to firefighters educating them about our Distribution Systems and how they operate as well as how to effectively operate a fire hydrant without creating water quality issues or damaging the Distribution System. CCWD plans to continue this training into the future. It is critically effective in ensuring the integrity of our Distribution Systems.

The Fire Protection District's help CCWD work to ensure the protection of our Customer's Property, CCWD also works to assist the Fire Protection District's in ensuring the cost effectiveness of that protection. This is accomplished through periodic fire protection system assessments conducted by the Insurance Services Office (ISO). The ISO calculates how well equipped a Fire Protection District, or Fire Department, is prepared to protect communities from fire. The ISO provides a score called an ISO Rating (also known as a fire score or a public protection classification) measured from 1(best) to 10 (worst). This score is then provided to Insurance providers who use it to help determine insurance rates for homeowners. The better the ISO Rating, the higher the likelihood for lower homeowner insurance rates. Four main criteria make up an ISO Rating:

- 50% - Quality of the fire department. Staffing level, training, and location of the fire house are included in this component.
- 40% - Water Supply. Ther number of fire hydrants, their flow rates, and how much water is available to put out fires are included in this assessment.
- 10% - The quality of the emergency communications systems (911, notification software like Everbridge, etc.)

- A bonus 5.5% comes from community outreach, including fire prevention and safety courses.
- Any housing development more than 5 miles from the nearest fire station gets an automatic score of 10.

As you can see the water system is 40% of the overall ISO Rating. This means that the condition of CCWDs Distribution Systems plays a huge role in not only determining water quality and reliability, but also homeowners insurance costs. This fact does not escape CCWD staff in any way. As a matter of fact, ISO evaluations occur every 4 to 5 years. The District works closely with the Fire Protection Districts to assist in these evaluations and helps to improve our communities ISO Ratings.

For Example, in 2014, Ebbetts Pass Fire's ISO Rating was a 5/9Y, it is now at a 2/2Y. Calaveras Consolidated's Jenny Lind System was a 5/5Y in 2023 and is now a 3/3Y. The Copper Cove System was also assessed in the early 2020's and is now a 4/4Y. These improvements are in large part to the District's Distribution Crews working closely with firefighters to make repairs to the system as necessary and to flow test hydrants as requested by our Fire Protection Partners.

To conclude, CCWDs relationship with our Fire Protection Partners remains strong. We all understand the importance of the infrastructure and work to ensure it will be ready when needed. Moreover, we know that the value of an effective, tested, well-maintained system goes beyond incident management. It carries over into our customer's budgets and that impact can remain with our communities for years. CCWD will not waver in its work within this arena. You can anticipate our cooperative work with our partners in the fire protection discipline to only improve over time as we strive to incorporate ways to improve our water systems and improve our ability to respond to and operate within emergency situations.

FINANCIAL CONSIDERATIONS:

The District Budgets $56,625 annually to pay for the maintenance inspections of our 2,625 fire hydrants. The Capital Outlay budget for the 2025 fiscal year includes $52,500 to replace15 aged and obsolete fire hydrants.

Agenda Item

DATE: July 2, 2024

TO: Engineering Committee, Calaveras County Water District
Michael Minkler, General Manager

FROM: Kevin Williams, Senior Civil Engineer

RE: Budget Adjustment PBI Engineering Consultants
Copper Cove Clearwell and B Tank CIP #11083C

SUMMARY
PBI Engineering Consultants is requesting a Budget Amendment Increase of $145,000 for completion of the Construction Management and Special Inspection (welding and geotechnical) for the Copper Cove Clearwell and B Tank Project. The original budget for PBI was not sufficient to perform the Construction Management and the Special Inspection task.

The Project has had numerous changes, but PBI has been doing a very good job at controlling the costs and staying ahead of the Contractor. The Construction Project is currently under the budget, and we have a net credit of approximately $157K in Change Orders. The Project is also scheduled to be completed before the contractual completion date.

FINANCIAL CONSIDERATIONS

There is sufficient budget in the Project for this Budget Amendment. The Welding Inspection and Geotechnical Investigation were moved into PBI's contract as is typically done. Consultant is providing the Construction Management.

Attachments:
1) PBI Budget request

80 Blue Ravine Road, Suite 280
Folsom, CA 95630
916-608-2212

June 18, 2024

Kevin Williams
Calaveras County Water District
120 Toma Court, San Andreas, CA 95249
kevinw@ccwd.org

Subject: **Request for Budget Amendment for Copper Cove Water System Improvements – Phases 1 and 2 Tanks Project Engineering Services During Construction (Task 14)**

Dear Kevin,

We are submitting to you our budget amendment request to support the Copper Cove Water System Improvements Phases 1 and 2 Tanks Project (Project) Engineering Services During Construction (Task 14). In November 2023, Amendment 2 was executed, which created Task 14. At that time, the scope of Task 14 was expected to be limited to typical engineering tasks during construction. However, per the District's request, we have performed additional construction management services in lieu of having a dedicated Construction Manager. Thus, we have performed additional coordination with the Contractor and District to facilitate construction, as follows:

- In lieu of having a dedicated Construction Manager, PBI has coordinated with the District and the Contractor and performed construction management services to facilitate submittal responses. The original scope in Amendment 2 included technical review of submittals for conformance with the specification requirements and returning them to the District or Construction Manager.
- PBI has coordinated with the Contractor and performed construction management services to facilitate RFI responses. Additionally, PBI prepared detailed variance requests and coordinated with the District to obtain DDW approval for five pipe crossings at the Clearwell site. The original scope in Amendment 2 included reviewing and providing RFI responses to the District or Construction Manager only.
- PBI has prepared change proposal requests in response to pothole data and District requests, and has initiated potential change orders. Revisions to the design drawings have included: tie-in modifications, pipe elevations adjustments to resolve conflicts, piping elimination to simplify operations, and the existing B Tank height revision. The original scope in Amendment 2 included PBI review and recommendations in response to Contractor change order requests only.
- PBI has facilitated weekly construction meetings, with one meeting per month conducted in-person. The original scope in Amendment 2 specified bi-weekly construction meetings.

As of the most recent billing period (through April 26, 2024), the total remaining amount in the Task 14 budget is $163,150, including $100,170 for special materials testing/inspection services. The average monthly billing for Engineering Services During Construction services performed by PBI (not including special materials testing/inspection services) has been approximately $23,000/month during the period from October 2023 through April 2024. Based on the work that has been completed through April 2024, the PBI billing is expected to be reduced to approximately 65% of that amount going forward ($15,000/month).

The environmental surveys and inspection work (Task 14.7) is complete so the remaining funds of $23,200 will be reallocated to support the other subtasks. The requested amendment will supplement the budget to allow for approximately $15,000/month on average for PBI services in Task 14 going forward for the Project. In addition, electrical engineering services will be provided at an average cost of $1,000/month and special materials testing/inspection services will be provided at an average cost of $7,700/month (through May 2025).

The estimated cost of additional services (in excess of the remaining budget) is $145,000. This estimate assumes the construction work will be completed as scheduled in May 2025. Services will be provided on a time and materials basis. We look forward to providing continued support for the Project. If you have any questions or desire any additional information, please do not hesitate to contact us at (916) 608-2212.

Karl Brustad, PE, MBA
President

Hannah Dunrud
Project Manager

Agenda Item

DATE: July 2, 2024

TO: Engineering Committee, Calaveras County Water District
Michael Minkler, General Manager

FROM: Kevin Williams, Senior Civil Engineer

RE: Arnold Wastewater Treatment Plant – USDA Rural Development

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SUMMARY

Staff completed and submitted the initial Grant Application with Clean Water State Revolving Fund (CWSRF) for Arnold Wastewater Treatment Plant. The Waterboard that administers the CWSRF notified the District that there are no funds available for the upcoming FY. Additionally, they have a backlog of applications that have already been submitted and approved. This Project is very critical as the existing infrastructure is failing and there is no redundancy or backup. The District does not have the luxury of being able to wait several years for possible funding through CWSRF.

Staff investigated other avenues for funding this Project. Staff had a conference call with USDA Rural Development. USDA has available funding in the form of long-term loans with a percentage of up to 43% that is forgivable, which is essentially a partial grant.

Staff have been working with our engineering and environmental consultants, HydroScience and Dewberry, respectively, to modify the Engineering and Environmental reports that were completed for the CWSRF application into the application format required by USDA. There are some USDA specific tasks that need to be complete that are not a “cut and paste” from the CWSRF application.

Additionally, the USDA has new requirements that all materials incorporated into the Project must be domestically manufactured. This is more stringent than the American Iron and Steel Requirements that have been around for years. There are advantages to having domestically manufactured equipment in a plant but oftentimes there are limited suppliers and longer lead times to acquire US manufactured equipment.

Agenda Item

DATE: July 2, 2024

TO: Engineering Committee, Calaveras County Water District
Michael Minkler, General Manager

FROM: Kevin Williams, Senior Civil Engineer

RE: La Contenta WWTP Improvements Engineering Design Consultant Selection - *Biolac and Clarifier Improvements CIP#15097*

SUMMARY:

The District issued a Request for Proposals (RFP) on March 11, 2024 for design services for the La Contenta WWTP Phase 3 Improvements (Phase 1-Intial Construction, Phase 2-Completed UV). A copy of the RFP is attached, including a project description and scope of work. Staff want the design completed by April 2025 and the Project publicly bid as early as July 2025 pending construction funding.

Phase 3 Project will improve treatment reliability and performance, add biological treatment capacity, implement nutrient removal, fully renew outdated electrical and controls, upgrade pond pumping system and address effluent hydraulic bottleneck. The Phase 3 improvements will increase the flow capacity and treatment capacity of the WWTP, allow for future expansion to buildout and reduce the effluent nitrogen levels. The District plans to solicit proposals for environmental documentation separately once the Pre-Design report is completed.

On the proposal due date May 30, 2024, the District received proposals from two (2) different engineering firms as tabulated below. Staff members including the District Engineer, Director of Operations and Senior Engineer reviewed and evaluated the proposals for considering various criteria such as qualifications and experience, content and presentation of the proposal and approach to work, completeness/variances in the proposed scope of work, allocation of staff hours to each task, general sense of value, subconsultant scope, potential scheduling issues and ability to deliver work within allowed timeframe, team organization and focus on key project issues, local representation and proximity to the project and prior performance on other District projects.

RANK	FIRM	FEE
1	HydroScience	$749,448

2	Stantec	$1,800,000

The proposal from HydroScience included $100,731 in construction assistance (to be budgeted during construction phase) and there is $114,686 identified as optional task that are the preferred alternatives. The proposal from Stantec includes $464,000 in construction assistance.

For professional services, the District is not obligated to make an award based on the lowest cost and can consider other criteria in the selection. Both Proposals were very close in the rankings with HydroScience ranking slightly higher than Stantec. The cost was revealed after the ranking of the Proposals was complete, and the higher ranked consultant, HydroScience, was also had a significantly lower cost.

FINANCIAL CONSIDERATIONS

The approved Budget for CIP #15097 includes $750,000 for FY 24-25 is sufficient for the base Project Proposal from Hydroscience of $749,448 with the consideration that $100,731 would not be spent on the construction assistance until Project goes into Construction which is anticipated in FY26-27. The overall Project cost including construction is estimated at $15,000,000.

Operations has identified the optional design task ($114,686) including the non-integrated clarifier as the desired Project. The District will also need to hire an Environmental Firm to complete the CEQA. Project Budget could be moved forward to FY24-25.

Attachments:
1) Request for Proposals, and
2) HydroScience Proposal

REQUEST FOR PROPOSALS

FOR DESIGN AND ENGINEERING SERVICES
FOR THE

LA CONTENTA WASTEWATER TREATMENT FACILITY
PHASE 3 IMPROVEMENT PROJECT

CIP 15097

Receipt of Proposals due before: 4:00 p.m. PST on May 14, 2024

CALAVERAS COUNTY WATER DISTRICT
120 Toma Court
San Andreas, California 95249
(209) 754-3543 • ccwd.org

March 11, 2024

TABLE OF CONTENTS

EXHIBITS

The **Exhibits** (proposal reference documents) have been assembled in separate Adobe pdf files. Reference documents listed in table below.

Proposal Reference Exhibits	
1.	Professional Service Agreement (PSA).
2.	La Contenta Wastewater Collection System and Wastewater Treatment Facility Phase 3 Improvement Project Predesign Report, February 11, 2024.
3.	La Contenta Wastewater Master Plan, 2017.
4.	La Contenta Wastewater Pumping, Treatment, & Storage Improvements As-Built Drawings, 1991.
5.	La Contenta Dam (LESP) As-Built Drawings, 2004.
6.	La Contenta Phase 2 Schedule 1 Disinfection, Electrical and Site Piping Improvements Record Drawings, 2007.
7.	WDR Order R5-2013-0133.

I. PROJECT BACKGROUND

Calaveras County Water District provides wastewater collection and treatment service to the community of La Contenta located in Calaveras County. District wastewater treatment service for the community is provided by the La Contenta wastewater treatment facility (facility). Facility improvements are required for continued service reliability and permit to approved planned community development. The District is seeking Consultant design services for the proposed Phase 3 Improvement Project, to be constructed at the La Contena facility.

The La Contenta facility was constructed in 1991 with the initial construction referred to as Phase 1. In 2007, Phase 2, was constructed. The Phase 2 improvement project primarily consisted of adding tertiary filter treatment capacity and the replacement of the chlorine disinfection system with an ultraviolet disinfection system. The facility is located at 1525 Campbell Court, Valley Springs, California and the site location is shown in Figure 1, attached to the end of the RFP.

II. PHASE 3 PROJECT IMPROVEMENTS

Initial details concerning the proposed improvements are described in the attached exhibit: *La Contenta Wastewater Collection and Treatment Facility Phase 3 Improvement Project Predesign Report, February 11, 2024.* Due to financial limitations, the District seeks to limit the Phase 3 improvement scope of work to the four components described below.

Secondary Treatment Improvements. A second, redundant, activated sludge treatment system similar to the existing treatment system with an average daily capacity of 0.225 *MGD*, and peak hourly capacity of 0.900 *MGD*. This system is to be comprised of the following:

1. A Parkson™ Biolac® activated sludge aeration basin, or similar.
2. Secondary effluent clarifier system.
3. RAS/WAS pump station.
4. Aeration system, or modification of existing system, required for the second d aeration basin.
5. Process piping and systems for splitting of influent, flow measurement, and piping for aeration air, influent, secondary effluent, and RAS/WAS flows.

Electrical and Instrumentation Improvements. Facility electrical and instrumentation improvements shall comprise of the following:

1. Electrical building housing the electrical service entrance, ATS, main MCC, etc. sized for facility build-out requirements.
2. Electrical improvements associated with Phase 3 equipment and operational requirements.

3. Replacement and/or relocation of existing electrical equipment located in the existing facility's Operation Room.
4. Replacement of existing SCADA system.
5. Identification and replacement, as required, of electrical equipment and/or equipment installation, not meeting current NFPA 70E, *National Electric Code* and NFPA 820, *Fire Protection in Wastewater Treatment and Collection Systems*.

Recycled Water Pipe System Improvements. A gravity flow effluent pipeline from the facility to the Lower Effluent Storage Pond (LESP). The pipeline alignment shall parallel the existing effluent pipeline alignment. Combined capacity of the two pipelines shall be a minimum of 2.0 *MGD*.

Storage Pond Drainage Improvements. Replacement of existing drain system for the Upper Effluent Storage Pond (UESP) to the existing Area (Return) pump station. The existing drain system is comprised of PVC pipe temporarily installed aboveground on the UESP west levee.

III. PROPOSED PROJECT SCHEDULE

The District anticipates the following project schedule by milestone. Significant construction at the La Contenta facility should be scheduled for a time starting in late April and ending in early November due to flowrate conditions related to rainfall.

PROJECT SCHEDULE MILESTONES

Milestone	Date
Design and Engineering Services Selection	
Project RFP	March 11, 2024
Job Walk Appointments	March 25 thru May 3, 2024
Proposal Deadline	May 14, 2024
District Review, Selection, and Staff Recommendation	June 13, 2024
Board Approval and Contract Award (FY 2024-25)	July 10, 2024
Design and Construction	
Final Design Report	October-November 2024
Final Design and Construction Documents	May 2025
Construction Bid and Award (FY 2025-26, FY 2026-27)	July 2025
Completion of Construction	September 2026
Start-up and Testing	October 2026
Record Drawings	November 2026

IV. PROJECT APPROACH AND SCOPE OF SERVICES

This Section describes the nature and scope of the engineering services to be provided and tasks to accomplish those services. The District expects the Consultant to work closely with District staff throughout the project by correspondence and regular meetings to accomplish their scope of work.

A. PROJECT MANAGEMENT

Consultant will ensure continuous control of the project in terms of staffing, budget, schedule and scope; promote communication within the project team and document key decisions. Items covered under this task include:

1. Consultant project management of project including communication, scope, schedule, deliverables, and budget.
2. Submittal of progress reports with Consultant invoices.
3. Quality assurance and quality control Implementation
4. Create and maintain Decision Log of key project decisions.

It is the responsibility of the Consultant's project manager to immediately notify the District Engineer of any District directed task/assignment/request the Consultant believes is beyond contract scope of service. Approval of additional work by the District Engineer is required prior to execution of the work. Costs related to the performance of additional work will not be paid unless first approved by the District Engineer.

Deliverables: Project progress reports and Decision Log throughout length of contract.

B. PROJECT DESIGN REPORT

The project design report will describe the project and project improvements elements/components. This report will be a refinement of the *La Contenta Wastewater Collection and Treatment Facility Phase 3 Improvement Project Predesign Report, February 11, 2024,* and shall address the following:

1. Evaluation of improvement elements and recommendations regarding proposed clarifier and RAS/WAS pump station design.
2. Estimated construction probable construction cost.
3. Recommendations concerning methods for reducing costs and/or alternative improvement solutions.
4. Recommend construction phasing to minimize impact to facility operation.
5. Preliminary hydraulic and process calculations.
6. Design criteria and preliminary equipment and material selection.
7. Preliminary scaled design concept drawings.

8. Proposed electrical and instrumentation improvements including electrical improvements associated with the existing facilities to meet NFPA 70E and NFPA 820.
9. Anticipated additional electrical loads.

Deliverables: Draft and final design report and attendance of a draft design report review meeting. The final design report shall address District comments, questions, changes, or decisions regarding draft report. Subsequent direction by District concerning the project design shall be tracked by Decision Log.

C. TOPOGRAPHIC SURVEY

Design services are to include a topographic site survey of the La Contenta facility at the location of proposed improvements. Survey shall conform to the North American Datum (NAD83), California Zone 3 and North American Vertical Datum of 1988 (NAVD88). All survey work shall be conducted under the direction of a California licensed land surveyor, or civil engineer licensed in California before January 1, 1982 (license number C33965 or below).

Survey shall include utility easements, roads, edge of paving, structures, buildings, manholes, vaults, pads, panels, walls, trees, utilities, poles, signs, fences, slopes, curbs, drop inlets, culverts, and other similar structures located at the La Contenta facility.

D. GEOTECHNICAL INVESTIGATION

Proposals shall include design and engineering services by a California licensed geotechnical engineer to prepare a project geotechnical study. Study shall include recommended methods of site excavation, allowable temporary and permanent slope design, foundation design, compaction requirements, and passive soil loads.

E. PERMIT AND ENVIRONMENTAL ASSISTANCE

The District plans to address environmental related project impacts with a California Environmental Quality Act (CEQA) mitigated negative declaration (MND). Preparation of the MND will be done by the District, or under a separate consultant contract. Project MND environmental requirements will be incorporated by the Consultant in the final bid ready construction and bid documents. The District does not anticipate the project will require an Environmental Impact Report.

F. PROJECT DESIGN

Drawings. The Consultant shall provide all necessary civil, mechanical, process, electrical, and instrumentation drawings for execution of project construction. This includes standard drawings such as: cover sheet, index of drawings, vicinity and location map, general notes, project notes, standard details, description of symbols, and abbreviations.

Deliverables: Fifty (50) percent, 90 percent 100 percent, and Bid-Ready drawings for incorporation with Project Manual. Drawing submittals shall be furnished to the District in Adobe® Acrobat™ Public Document Format (Adobe pdf) file format for reproduction as both 11"x17" (ANSI C) and 22"x34" (ANSI D) paper size. Bid-Ready drawings shall be furnished in Autodesk® AutoCAD™ format.

The 90 percent and 100 percent deliverables shall identify and detail all infrastructure to be constructed. The 100 percent drawings shall represent the final project design. The Consultant shall anticipate revisions to the 100 percent drawing based upon final District comments prior to production of final Bid-Ready set.

Project Manual. The Consultant shall prepare a project manual including front end document, technical specifications, and appendices. The manual's front-end documents shall be based on the 2018 edition of the *Engineers Joint Contract Documents Committee Standards* (EJCDC®). A copy of the standards will be furnished to the Consultant by the District. The Consultant shall edit the EJCDC® documents adding any project specific and State of California contract requirements. Consultant shall provide a bid schedule, detailed descriptions for each bid item, alternative bid items, if any, and description of sequence of work.

The technical specifications shall be based upon the Consultant's standards, or if applicable, adapted from District standards. Project Manual appendices shall include CEQA documents, geotechnical study, and other such reports.

Deliverables: Ninety (90) percent 100 percent, and Bid-Ready Project Manual.

G. CONSTRUCTION ASSISTANCE

Construction Bid Services, Addendum, and Conformed Documents. The District shall advertise and conduct the public bid. Distribution of project manual and drawings to bidders and plan holder rooms will be electronic. All correspondence with potential project bidders will be solely conducted by the District including issuing all project addendum and responds to bidder Requests for Information (RFI).

The Consultant shall attend pre-bid job walk and as requested the Consultant shall assist the District prepare addendum and answer RFIs. Addendum may be the result of errors in preparing bid ready drawings and project manual or result of bidders' questions and comments.

Upon award of construction contract and but prior to subsequent notice to proceed, the Consultant shall furnish the confirmed contract documents.

Construction Engineering. Consultant scope of services during construction shall include review of project shop drawings and submittals, answer of construction RFIs,

assistance with engineering aspects of potential construction contract change orders, site and construction meeting upon request.

Record Drawings. The Consultant shall furnish record drawings and deliver them in AutoCAD® 2018 format. Record drawings shall be based upon the contractor and District inspector marked-up drawings.

H. BASIS OF COMPENSATION

The Consultant shall be required to enter into the Professional Services Agreement (PSA) provided as **Exhibit 1**. Agreement to the PSA contract terms and conditions, including adjustment in hourly rates, per diem or incidental costs, is required for the term of the contract. Acknowledgement to the PSA contract terms shall be included in a cover letter.

V. ORGANIZATION AND CONTENT OF PROPOSAL

A. SUBMITTAL INSTRUCTIONS

Proposals shall be submitted electronically to Calaveras County Water District no later than 4:00 p.m., May 14, 2024. The Proposal shall assemble as a single Adobe® pdf file. Paginate proposal for two-sided printing at the District office. Paper size limited to 8-°1/2”x11” (ANSI B) with figures, drawing, etc. no greater than 11”x17” (ANSI C).

Proposals attached to email are limited to 50 megabytes in size. Proposal delivery using a file “cloud” sharing site, or similar, is acceptable provided the District receives a HTTP or FTP link and download instructions. The District will notify the Consultant upon receipt and successful download. No hard “printed” copy of the proposal is required.

Email proposal, or link for file download to the attention of:

Kevin Williams, P.E.
Senior Civil Engineer
kevinw@ccwd.org
office: (209) 754-3184
cell: (209) 419-3979

B. ORGANIZATION AND CONTENT

Contents of proposal shall be organized in the sections listed in the table below.

PROPOSAL ORGANIZATION

Section	Content	Page Length
Cover Letter	Statement of interest and qualifications including agreement to PSA requirements.	1 to 2
A	Project Overview	1 to 3
B	Understanding and Approach	1 to 4
C	Team Organization	1 to 2
D	Project Schedule	1 to 2
E	Representative Project Experience	1 to 5
F	Labor Estimate	1 to 2
G	Project Team Resumes	as required

Cover Letter. Cover letter shall include both a state of interest and statement of qualification. Acknowledgement and acceptance of the terms and requirements of the District Professional Service Agreement shall be included.

Project Overview. Provide a narrative description of the project based on the scope of services and proposed schedule presented in this Request for Proposal (RFP). The District will assess your understanding of all aspects of the project based on the overview.

Understanding and Approach. Provide a detailed description of the proposed approach to the project as described in the RFP. The description shall include details to implement the tasks described in the scope of service and any recommended revisions to the list of tasks. The approach should recognize, address, and provide for resolution of all aspects of the project.

Team Organization. The proposed consultant team shall be identified including project manager, and project engineer. Key tasks and the associated personnel shall be identified. The percentage of time devoted to this project for these key personnel shall be stated and guaranteed. A consultant team organization diagram shall be included.

The geographic location of the firm and key personnel shall be identified. Any proposed subcontractors shall be identified; tasks assigned, and experience included similarly to the firm's own project personnel. The successful Consultant should be comfortable working in a structured team setting with District Staff.

Project Schedule. A project schedule for the project shall be submitted with the proposal. All major outputs and meetings shall be included in the schedule. Time shall be allocated for District review, typically three weeks for each deliverable.

Representative Project Experience. Provide a summary of experience of similar projects that the firm and the proposed team have completed. The description of each project should include the year(s) during which the work was performed and a description of process design components. The firm's role in the project should also be described (predesign, design construction management, etc.). Include the name, title, and phone number of the primary contact person at each facility or project location listed.

Staff Labor Estimate. Provide a staff estimate of time for each task to permit the District to determine the level of detail and the number of management, engineering, technical, drafting and support personnel hours envisioned for each task. Estimates of hours for each staff classification shall be provided for each task.

Project Team Resumes. A resume of key team members shall be included. Each resume should include a description of projects in related areas. At minimum, resumes of the Consultant's project manager and those of the engineering staff shall be included.

VI. EVALUATION AND SELECTION CRITERIA

Consultant proposals will be evaluated by District staff members including the District Engineer, Director of Operations, Operations Manager, General Manager, and Senior Engineer. Proposals will be evaluated by each reviewer with each proposal receiving a weighted score. Each evaluator's weighted score will be tabulated and the firm with the highest combined score will be selected and recommended to the District Board. If two or more proposals are similarly ranked, and no clear decision can be made, the District will request interviews before final selection.

PROPOSAL EVALUATION WEIGHTED CRITERIA TABLE.

Criteria	Evaluator's Score (0 to 5)	Score Weight (Multiplier)	Evaluator's Weighted Score
Project Understanding and Approach		5 *(25%)*	
Project Management		3 *(15%)*	
Project Team and Staff Qualifications		4 *(20%)*	
Related Project Experience		3 *(15%)*	
Schedule and Production Capability		5 *(25%)*	

Maximum weighted score = 100.

*** END OF RFP ***

FIGURE 1

LOCATION MAP

La Contenta Wastewater Treatment Facility

Calaveras County Water District / La Contenta Request for Proposals
February 2024

FIGURE 1

Design and Engineering Services for the

La Contenta Wastewater Treatment Facility Phase 3 Improvement Project

PROPOSAL | MAY 30, 2024

Prepared for:
Calaveras County Water District

Prepared by:
HydroScience Engineers

HydroScience

HydroScience
Strategic Water Solutions

HydroScience Engineers, Inc.
10569 Old Placerville Road
Sacramento, CA 95827
916.364.1490

May 30, 2024

Kevin Williams, P.E.
Senior Civil Engineer
Calaveras County Water District
120 Toma Ct.
San Andreas, CA 95249

Subject: Proposal for Design and Engineering Services for the La Contenta Wastewater Treatment Facility (WWTF) Phase 3 Improvement Project

Dear Mr. Williams:

HydroScience is pleased to submit this proposal to develop a design and support the bidding and construction of process, electrical, and controls improvements at the La Contenta WWTF. The upgraded facility will add biological treatment and secondary clarification capacity, improve nutrient removal, add effluent conveyance capacity, and comprehensively replace and upgrade the electrical power supply and distribution, master control panel, and SCADA system.

Our proposed team will be led by Project Manager Bill Slenter, PE, who you are already working with on the Arnold and Copper Cove wastewater facility improvements. He has demonstrated an ability to collaborate effectively with the District to implement complex treatment projects. Bill will be supported by a comprehensive multi-disciplinary team who will work cohesively to develop a well-coordinated set of bid documents that will result in a predictable construction phase resulting improvements that provide high long-term value.

Our in-house team of civil, process, mechanical, electrical, instrumentation, and controls engineers will be supplemented by specialty subconsultants providing structural engineering, surveying, and geotechnical services. These are firms we have worked effectively with on countless prior projects. Additionally, we have included PCSG to perform independent third-party cost estimating and optional constructability review services. We collaborated with PCSG in a similar fashion on the Arnold project and look forward to leveraging their construction industry knowledge to provide detailed and accurate estimates on this project.

The enclosed proposal details our team, extensive related wastewater treatment experience, our proposed approach and work plan, our schedule, and our labor estimate for completing the project. We have also presented our “early and often” approach for effective collaboration with the District to streamline reviews and arrive at a completed project that is well-tailored to your goals, objectives, and long-term needs.

HydroScience will execute the District’s standard professional services agreement that was attached to the RFP. HydroScience is the right-sized firm with the people, experience, and client-focused work culture needed to exceed your goals. Should you have any questions about our proposal, please contact me at bslenter@hydroscience.com or (916) 273-6035.

Sincerely yours,
HYDROSCIENCE ENGINEERS

Bill Slenter, PE
Vice President

Section A

PROJECT OVERVIEW

This Section presents HydroScience's overview of the project goals, upgrade elements, key driving issues, and schedule objectives. This overview is based on our thorough review of the Request for Proposals (RFP) and supporting materials, discussions at the March 6, 2024 Engineering Committee Meeting, a visit to the facility and discussion with engineering and operations & maintenance (O&M) staff, our experience with similar projects, and our understanding of Calaveras County Water District (District) priorities.

HydroScience and our key proposed project team have been working with the District since 2021 on two similar wastewater upgrade projects: the Arnold and Copper Cove Wastewater Treatment Facility (WWTF) improvement projects. These projects have many similarities to La Contenta, which are highlighted in Section E. This experience enhances our understanding of District priorities and procedures and will provide significant efficiencies on this project.

The La Contenta WWTF, constructed in 1991 and subsequently upgraded in 2007 (Phase 2 project) treats wastewater from the community of La Contenta to disinfected tertiary recycled water standards. This effluent is held in two seasonal storage reservoirs and delivered to the La Contenta Golf Club for irrigation use. The facility is permitted under Order R5-2013-0133 as amended by R5-2018-0062. The treatment train consists of a mechanical bar screen, Biolac activated sludge treatment basin with an integral secondary clarifier, continuous backwash sand filtration, ultraviolet (UV) disinfection, sludge lagoon and belt press, two unlined storage ponds, conveyance piping, and supporting systems.

The District issued a design report (La Contenta Wastewater Collection System Improvement Project and Wastewater Treatment Facility Phase 3 Improvement Project Predesign Report, February 11, 2024) which updated certain assumptions and findings of the prior 2018 Master Plan and presented a recommended Phase 3 Project including design criteria and preliminary layout drawings. The RFP seeks engineering services to implement a subset of these. The planned improvements are summarized as follows:

Element	Purpose	Notes
Second Parkson Biolac or similar activated sludge aeration basin	Provide process redundancy, increase treatment capacity, implement nutrient removal capability, allow for future improvement of existing basin, improve performance	If integral clarifier selected for cost reasons, implement latest Parkson design for improved clarification and scum removal performance versus existing
Secondary clarifier	If funding allows, construct an independent circular clarifier to serve new Biolac and potentially both	Recommend evaluating option to size clarifier to serve both Biolacs
RAS/WAS pump station	If funding allows, construct a separate RAS/WAS pump station to serve the new circular clarifier	Recommend evaluating option to size RAS/WAS pump station to serve both Biolacs
Aeration blowers	Increase capacity of existing aeration blower system, or construct a new system	Two available spaces in existing blower room can be used
Process piping and flow splitting	Construct required buried yard piping and flow splitting structure to serve a two-train biological process	Consider approach taken on similar Arnold WWTF project
New electrical building with service entrance, ATS, MCC. New diesel standby generator. Upgraded utility power service and transformer.	Full replacement of existing obsolete components and relocation to a dedicated building.	Size room, pads, and main bus for buildout expansion. Preliminary sizing of buildout loads required. Sequenced construction required.

This Phase 3 Improvement Project will improve treatment reliability and performance, add biological treatment capacity, implement nutrient removal, fully renew the electrical power and PLC/SCADA control systems, upgrade a pond pumping system, and address an effluent hydraulic bottleneck. The upgrades will address the capacity needed to satisfy current development commitments and make allowance for future expansion to buildout conditions. They will also improve effluent quality to position the facility for future regulations.

The Phase 3 Improvement Project will increase the flow capacity and treatment capabilities of the WWTP, and allow for future expansion to Buildout, as follows:

Parameter	Current	Phase 3 (This Project)	Buildout
Service Area (EDU)	1,110	1,577	2,250
Influent Flow (MGD)	ADWF: 0.2 AAF: 0.24 MDF: 1.0	ADWF: 0.338 AAF: 0.45 MDF: 1.25	ADWF: 0.45 AAF: 0.625 MDF: 1.78
Influent Strength (mg/L)	BOD: 225 TSS: 225	BOD: 200/300 TSS: 200/300 TKN: 50	BOD: 200/300 TSS: 200/300 TKN: 50

Values are approximate and based on existing WWTF drawings, discharge permit, March 6, 2024 presentation to Engineering Committee, and District's Predesign Report. The effluent storage capacity currently limits ADWF to 0.20 MGD and AAF to 0.24 MGD (89 MG/365 d). HydroScience will confirm design flows at an early stage of the Project.

ADWF = Average Dry Weather Flow; AAF = Annual Average Flow; MDF = Peak Day Flow; BOD & TSS values are presented as Average/Max Month

Current and anticipated effluent limitations driving the project design are as follows:

Parameter	Current	Anticipated
Effluent BOD (mg/L)	40/80	40/80
Total Nitrogen as N (mg/L)	22	10
Turbidity (NTU)	2/5/10 (Title 22)	2/5/10 (Title 22)

Parkson's proposal indicates an effluent BOD of 10 mg/L is achievable.

The District anticipates that future permits will reduce the effluent nitrogen limitation from 22 to 10 mg/L. This is based on a 10 mg/L groundwater quality limit. Monitoring wells below the unlined storage basins do not currently show impairment, but positioning the WWTF for better nutrient removal will eliminate a risk of future more stringent regulations. This will also position the facility better for a potential future surface water discharge to Cosgrove Creek, should this be pursued to resolve seasonal storage limitations for future flow increases.

The Project will examine options for both an integral clarifier as part of the new Biolac unit (least expensive option) or a separate circular clarifier (more costly but better performing). The District prefers a circular clarifier if it is deemed affordable, given that it has experienced inadequate performance from

the existing integral clarifier including solids resuspension, poor scum control, poor RAS flow control with the airlift pump, and lack of clarifier isolation and drain features.

Effluent is primarily stored in the 172 acre-foot (AF) Lower Effluent Storage Pond (LESP) and supplemented by the 49 AF Upper Effluent Storage Pond (UESP) which serves as backup storage and provides retention time for any effluent not meeting Title 22 recycled water standards. All effluent in the UESP is pumped back to headworks for retreatment via a temporary pump station using conveyance piping routed on the surface to the headworks return (drain) pump station.

A 3,700-foot 8" gravity pipe conveys flow from the effluent side of the WWTP around the UESP to the LESP. The District calculated the capacity of this line at 0.69-1.04 MGD depending on LESP water level. The Project will increase the capacity of this pipeline to a minimum of 2.0 MGD. A portion of the pipeline is located in an existing 15-ft wide easement, part of which is off-road. Generally the pipeline is shallow buried but a segment of it passes through a ridge at depths of up to 20-ft. Hard rock may be present in the area.

There is not adequate funding in the 5-year CIP to complete construction. The District intends to fund the completion of design resulting in shovel-ready contract documents that can be publicly bid when developer fees associated with committed projects become available. There are currently 100 EDUs of capacity left in the existing system, and development commitments comprise an additional 600 EDUs.

Our approach, proposed scope of work, and schedule for planning and implementing best-value improvements to the La Contenta WWTF through a collaborative process are described in the next section.

Section B

UNDERSTANDING AND APPROACH

HydroScience will implement the same collaborative approach successfully used on the Arnold and Copper Cove projects to tailor project improvements to District needs, standards, and budgetary constraints: (1) regular meetings and communications with District management, engineering, operations, and maintenance staff; (2) comprehensive data collection and evaluation; (3) validation of key design criteria; (4) inform confident decision-making; (5) identify creative solutions to maximize long-term value and system reliability.

The District will be a key part of the collaborative process. The best value project approach will conform to your operating strategies and standards, maximize and extend the value of existing assets, facilitate operational simplicity and flexibility, provide robust long-term service, and balance robustness with affordability. Our design approach will consider future expansion to address buildout flows and possible changes to recycled water storage and discharge strategies. By involving District staff early and often, we will facilitate design consensus, streamline your milestone reviews, adhere to the schedule, and deliver a best-value final product.

HydroScience's in-house civil, mechanical, process, electrical, instrumentation and controls engineers, working in concert with our trusted structural subconsultant, VE Solutions, and informed by the work of our investigative subconsultants O'Dell (surveying) and Blackburn (Geotechnical), will efficiently advance a cohesive and well-coordinated design.

Our approach implements continuous project cost management informed by timely and accurate estimating. A lesson we learned on the Arnold project is that the District finds benefit to involving a third party cost estimating consultant on complex treatment facility improvement projects. This maximizes the accuracy of estimates and incorporates the very latest construction cost trends. Given the recent volatility in bid pricing, we have decided to delegate cost estimating to PSCG as a subconsultant to HydroScience and optionally have them provide constructability reviews. We previously worked with PSCG (contracted with the District) on the Arnold project and have a solid working relationship.

Unit Process Upgrades Approach

This section describes our understanding and potential design approaches to key unit process upgrades, building upon our understanding of existing facilities and District goals, and our prior successes and lessons learned on similar projects including Arnold and Copper Cove.

Activated Sludge Basin and Blowers

A new Parkson Biolac or equivalent activated sludge treatment system will operate in parallel with the existing unit, creating a two-train biological and clarification process. A new splitter box and flow metering facility will be constructed to intercept raw wastewater from the headworks and split the flow between the existing and new basins. Our flow splitting and metering design for the Arnold facility will serve as a template for this item.

HydroScience has reviewed Parkson's proposal (District Predesign Report Appendix P) and met with Parkson. Our approach to configuring and specifying this system will build upon District lessons learned, utilize the latest Parkson or equivalent product design, maximize flexibility and reliability, and evaluate a stand-alone clarifier option.

An earthen basin lined with shotcrete (matching existing) will maximize service life and simplify cleaning and maintenance. A biological nutrient removal (BNR) configuration will be specified to achieve enhanced denitrification for an effluent

HydroScience will achieve a predictable outcome that provides high long-term value by approaching this project as follows:

Minimizing Unexpected Costs	Maximizing Long-Term Project Value
• Strategic geotechnical and potholing exploration locations and extent • Well defined rock clause and hard rock line item in bid schedule • Emphasize plans and specs that are clear, concise, accurate, and coordinated • Independent internal QA/QC of all deliverables • Utilize independent third party construction estimator for estimates and reviews	• Name multiple manufacturers and materials to increase pricing competition • Minimize complexity of concrete structures • Minimize the area and depth of excavations where shallow hard rock exists • Choose equipment with a history of successful installation, District familiarity, and a robust and responsive support network • Choose construction materials that will provide a long service life

Total Nitrogen of less than 10 mg/L to address anticipated discharge requirements. This will consist of alternating aerobic and anoxic zones and advanced dissolved oxygen (DO) controls.

Given that this will be a public bid, Biolac alternates will be considered. Bioworks offers a similar extended aeration product. A key difference is that the diffusers float on top of the liquid. HydroScience will contact the product vendor, solicit a budgetary proposal, and carefully vet this offering in comparison to the Biolac to determine if it is a true equal. We will also contact recent operating installations for both products to better understand operating experience, benefits, pitfalls, and technical/feature considerations for the specifications. We will draft a technical specification laying out performance requirements/guarantees, materials, technologies, features, and minimum qualifications and make a recommendation to District regarding which products to allow.

The original 1991 KASL as-builts and the District Predesign Report place this second basin west of the existing. This site is currently functioning as a water treatment sludge drying basin. The District intends to decommission and relocate this pond prior to Project construction. The site topography is similar to the existing basin, facilitating flow split hydraulics. The hill to the north will need to be laid back at presumably a 3:1 slope to create a flat area for construction and perimeter access paths.

The new activated sludge system will require an expansion of blower capacity. These can be supplied by Parkson or separately procured by the Contractor. The existing blowers, likely supplied by Parkson, are located in a blower room in the existing treatment plant building. Space and connection points for two additional blowers is available, and a 12" Air stubout is located outside of the building to supply the second basin. We will validate the ability of these provisions to accommodate the additional air supply required, and the air control requirements for operating the new basin in BNR mode in conjunction with the existing non-BNR basin. If space in this room is insufficient, we will evaluate the adjacent unused chemical room to house blowers.

Clarifier and RAS/WAS Pumping

Figure 1 (next page) illustrates the clarification options that will be considered in our preliminary design report. Our base scope includes design of an integral clarifier to maximize cost-effectiveness. It will utilize Parkson's latest generation "EZClear" clarifier design which includes improvements that help address some of District's difficulties with the existing unit, including improved inflow hydraulics. HydroScience will carefully review and, where feasible and appropriate, enhance the clarifier specification to address the District's lessons learned with the existing one. Both the existing clarifier design and the EZClear system utilize airlift pumps; however, Parkson does offer a mechanical RAS pumping option. The District has had difficulty managing turndown with the existing airlift system. HydroScience will review the newest Parkson airlift design versus their mechanical pump option across the desired flow range, compare costs, and make a recommendation in consideration of past challenges and product improvements.

Optionally, HydroScience will specify the activated sludge basin without an integral clarifier and instead design a new separate circular clarifier to clarify mixed liquor from this process train. The new clarifier would be expected to use a similar configuration to the design used on Arnold. During preliminary design, we will evaluate the costs and merits of upsizing the clarifier diameter to provide the flexibility to also treat flow from the existing Biolac, at least dry weather flow. This may be achievable with a modest additional construction cost to upsize the clarifier and hydraulically link the activated sludge basins. The final decision on clarification approach will depend on cost. We will present the comparative costs of both options in our Project Design Report. Optionally, we can set up a tour with Parkson and District staff to visit operating EZClear installations to enhance our understanding and comfort level with that option.

If a separate clarifier is designed, then HydroScience will also design a separate RAS/WAS pump station for this clarifier. A single pump station with a motorized 3-way valve for periodic wasting is anticipated. At Arnold, we evaluated submersible chopper pumps, progressing cavity, and self-priming double-disc pumps. Double-disc pumps were selected due to staff familiarity, reduced installation costs (requires no wet well), better turndown, and ability to pass solids and grit that may have bypassed the headworks. We will conduct the same evaluation for this facility, considering site-specific conditions, flow ranges, and input from operations and engineering.

The activated sludge basin and clarifier designs will include, to the extent feasible, efficient means to drain process tanks for maintenance. The ability to gravity drain tanks to the existing return pump station will be explored, and other possible approaches will be identified and vetted with District staff. A design goal will be to allow operators to transition from one process train to the other or both as efficiently as possible, and to maximize the ability to take tanks offline for heavy maintenance.

Effluent Pipeline Improvements

Increasing the capacity of effluent conveyance from the WWTP to the LESP is anticipated to involve construction of a new pipeline running parallel to the existing 8" TE pipe. The combined capacity shall be 2.0 MGD. The District calculated the existing pipe capacity at 1.04 MGD. A new 8 or 10 inch pipe is anticipated to provide this capacity. The new pipe will be intertied to the buried manifold downstream of the Parshall flume and fitted with a motorized control valve similar to existing. The new pipe will be installed adjacent to the existing in the UESP levee, then cross-country to the access road intersection, then within or adjacent to the road until it reaches the LESP. We anticipate the new pipe

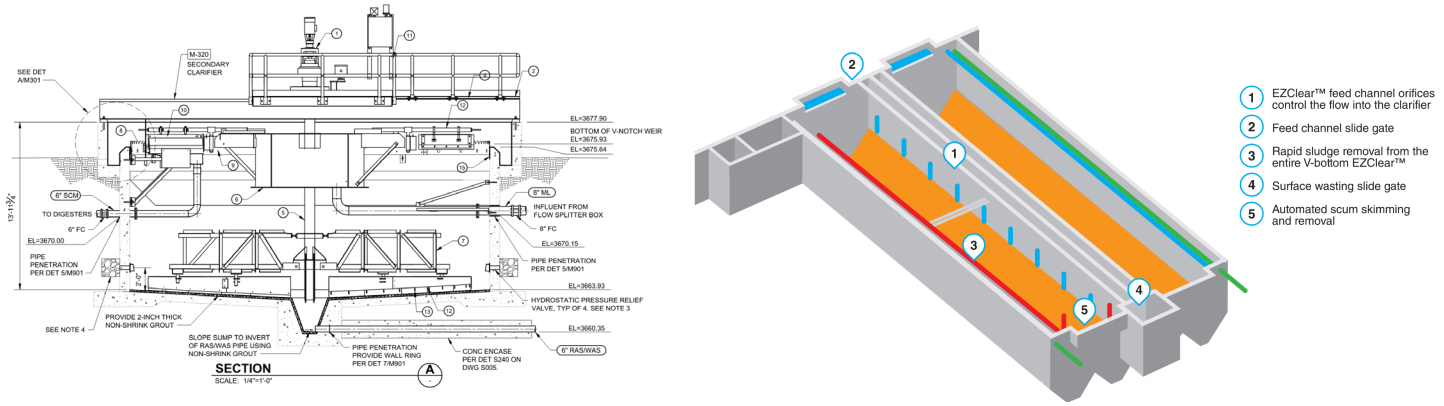


Figure 1. *HydroScience will evaluate two options for secondary clarification: a stand-alone circular clarifier (similar to our Arnold WWTF design) or an integral clarifier (Parkson Biolac EZClear or equal). The EZClear can be configured as a redundant pair or a single clarifier per basin. The clarifier can be oriented as shown or rotated 90 degrees, similar to the existing. We will recommend a path forward based on budgetary and operational priorities.*

would discharge on the inner bank at a high elevation that can be installed without draining the LESP. We will evaluate hydraulics and operating strategies for the two pipes during design.

A portion of the 8" TE alignment is within what appears to be a 15' easement. Our base survey scope does not resolve the boundary but includes a conceptual boundary. Should the clearances required for new pipe installation be marginal, we may recommend a fully resolved boundary survey at additional cost.

Hard rock is believed to exist in this alignment. The minimum cover on the pipeline is 36" although the deepest section is approximately 20' deep. At these depths, presence of hard rock becomes a significant risk to cost. Our geotechnical investigation scope described below seeks to address that risk with sufficient exploration followed by careful crafting of the project specifications and bidding requirements.

UESP Drainage Improvements

This project element will replace the existing portable pump and hose arrangement with a permanent pumping facility and piping to convey UESP water back to the treatment process. HydroScience will evaluate two approaches: a submersible pump wet well configuration, or self-priming pumps sitting on or adjacent to the levee on a concrete pad. Similar alternatives can also be considered, such as horizontal centrifugal pumps at the levee toe with a flooded suction pipe. We will meet with the District early to understand the options and timing for lowering the water level in UESP. If this is very limited or infeasible, we will carefully consider this factor in comparing suitable approaches. The self-priming pump option does not require embedding a deep suction pipe in the levee, while the others do. We have successfully used self-priming pumps on other pond facility projects.

Electrical & Controls Upgrades

The electrical upgrades design is expected to involve similar elements to the Arnold project. We will coordinate service size and transformer location with PG&E in consideration of Phase 3 loads and allowances for Buildout. A new masonry electrical building will be designed to house new MCC equipment that will power existing and new facilities with space for future. This building will be located near the transformer. New ductbanks and junction boxes will be located at existing and new process units.

Construction Phasing Strategy

A carefully crafted construction staging strategy will be specified to make process interties and complete functional and performance testing, and to transition processes from the old MCC and control panel to the new, with temporary power backfeed provisions to facilitate the transition with minimal interruption. We will interview plant staff to understand maximum outage durations and incorporate these limitations in the specifications. When complete, the existing MCC will be demolished and this will create a safer and more spacious working environment in the existing operations and lab room.

We worked through all the same issues on the Arnold project, and will use that knowledge as a starting roadmap for developing the La Contenta phasing strategy, carefully customized to the specific needs, risks, and constraints at this facility. We fully appreciate the attention to detail needed to properly guide a general contractor through this process while avoiding undue risks or change orders.

Project Management

HydroScience will manage the project with an emphasis on diligence, tracking and verification, efficiency, effective communication, and delay avoidance. Project Manager Bill Slenter will leverage his long history of managing complex wastewater projects to foresee and collaboratively address

challenges before they impact the schedule or budget.

Bill and the team will maintain regular phone, email, and written communication. At all times the District will be well informed of the status of the project and the questions and issues that are coming. We will visit the site and collaborate through in-person and screen-share calls. In respect of staff time, we will boil down all communications to the key issues by doing our homework first and communicating in a concise and focused manner.

The workshop format will be used to communicate with the District at key milestones and solicit input. Every workshop will include handouts and visual aids in order to move quickly through the presentation portion, fully inform District staff, and encourage productive discussion. Agendas will be prepared for all meetings and distributed one week in advance, and summary minutes will be distributed within three days of every meeting. Monthly budget, schedule, and work progress status reports will be prepared and included with every invoice.

A log will be developed to prioritize issues and document decisions, and this will be distributed to the District at meetings and monthly. The decision log will be referenced during every design decision to ensure that District comments are addressed.

The District will be informed at all times as to the status of the project, decisions that need to be made, the input needed to make those decisions, and the anticipated final product.

Scope Clarifications

HydroScience will implement the scope of work described in the RFP, as modified and enhanced below. If selected for this Project, we will prepare a consolidated formal scope of work melding the requirements of the RFP with these modifications for inclusion in the contract.

Meetings and Collaboration: HydroScience has included an on-site kickoff meeting, 5 design milestone workshops, and bi-weekly meetings over a 39-week period in our budget.

Project Design Report (PDR): HydroScience will prepare a report that validates and details the recommendations of the District Predesign Report, and attach 30% drawings. Format and level of detail will be similar to the Arnold PDR (November 2021). Our sizing calculations will rely on the flow and load projections made by the District, though we will complete a cursory check of the design criteria based on the data presented. Since that report looked at data up to end of 2023, it is very recent and should not need further updating. Any process data or additional sampling required to support the project will be collected by the District at their expense. Allowances will be made in the load calculation and pipe sizing for the Buildout condition as defined in the District Predesign Report and based on discussions with District staff. Both the integral clarifier and separate clarifier plus RAS/WAS pump station will be evaluated. The integral clarifier is assumed for the design base scope.

Survey: Limits of survey capture the entire WWTP site including the UESP and the proposed location of the new process units and electrical building, and a 100-ft wide strip along the 8" TE pipeline alignment from the WWTP to the LESP. Cross section surveys of the alignment will be made at 100-ft intervals. Conceptual (non-resolved) boundary mapping will be included. This is conditional upon finding sufficient corners set by previous surveys.

Geotechnical: Subsurface exploration consists of two 15-ft borings and two 30-ft borings covering the WWTP improvements, subject to presence of competent rock, utilizing a truck mounted drilling rig. For the pipeline alignment, four 12-ft deep test pits will be excavated with a rubber-tired backhoe. A seismic refraction survey consisting of four lines along the pipeline alignment will be used to supplement the test pits.

Design: HydroScience will develop the design for the improvements described in the RFP and our overview (Section A) and submit review sets at 50%, 90%, and 100% milestones. The bid-ready set will incorporate final bidding requirements and signatures. All submittals will be electronic (PDF and native file formats). Changes in the design are expected to be minimal at the 90% submittal stage. District review is mainly to capture minor edits or changes in the notes.

The electrical upgrades design for existing process units will be limited to connecting new conductors at the existing field motor disconnects. Our scope excludes modifications to existing process equipment (panels, motors, etc.) to meet current codes or for other reasons.

Permit and Environmental Assistance: The District will prepare any required CEQA and RWB permitting documentation. HydroScience will provide project-specific descriptions, data, and figures to support this effort.

Bidding and Construction Assistance: HydroScience's scope will be in accordance with the RFP scope description. HydroScience has based our effort for this phase on the following quantities: 3 addenda, 35 RFI reviews, 75 submittals plus resubmittal responses, virtual attendance at 8 construction meetings, and 4 site visits. Construction management, inspection, and materials testing will be by others.

Optional Services: The fee includes the following optional items which can be added to the base scope if desired or required:

- Resolved boundary survey
- Optional three additional geotechnical borings for a separate clarifier, RAS/WAS wet well, and UESP wet well style pump station. It is assumed the UESP is not under DSOD jurisdiction.
- Optional structural design of separate secondary clarifier.

Section C

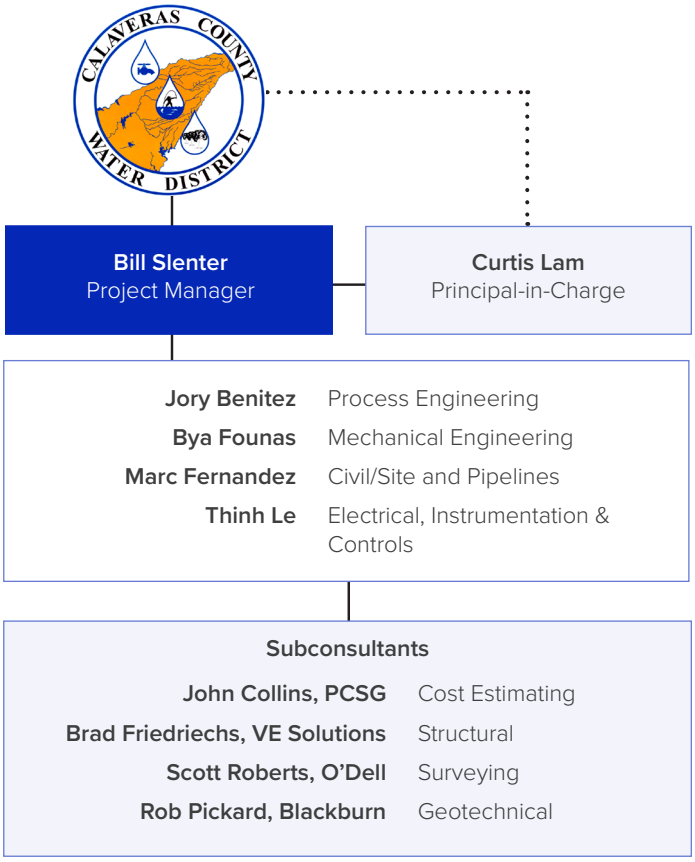
TEAM ORGANIZATION

Proposed Project Staffing

HydroScience has committed a comprehensive team of engineers with extensive experience in wastewater treatment infrastructure, including two recent treatment plant upgrades for Calaveras County Water District. These team members have successfully worked together on many wastewater facility upgrade projects throughout Northern California, and they bring their experience and lessons learned to the District. The team brings the following benefits:

- **Local Presence.** Our proposed project manager and most team members are based in Sacramento, including our in-house electrical engineers. Our subconsultants are also local. Many of the core team members are familiar to the District, having worked together on the Arnold WWTF project and the Copper Cove WWTF project. Our proximity and familiarity will enhance data collection, coordination, and project optimization to best fit District needs.
- **Experience Tailored to Your Needs.** Our focused and versatile team gives the District the needed expertise, while remaining responsive and flexible to the project's unique requirements. As a firm devoted entirely to water and wastewater projects, we take the time to listen to our clients and deliver highly personalized service that will meet your specific needs and expectations.
- **Single Point of Contact.** Our proposed project manager, Bill Slenter, PE, is a principal with HydroScience and will be your dedicated point of contact throughout the entire project. Bill is a wastewater infrastructure expert based in our Sacramento office, less than an hour's drive from the District offices. He served as HydroScience's lead on both the Arnold and Copper Cove projects. He will be available when you need him.

Project Team Organization



The structure and reporting relationships of our team are shown in the organization chart. Brief qualifications and role descriptions for each of the team members can be found below and on the following page. Resumes for all proposed staff, including subconsultants, are included in the final section.

Bill Slenter, PE – Project Manager

Our proposed project manager, Bill Slenter, PE, managed both the District's Arnold WWTF Improvements and the Copper Cove WWTF Tertiary and Pond 6 Utilities Upgrades projects. Bill's strengths include strong leadership, client focus, flexibility, creativity, and commitment to a successful outcome.

Bill is a civil engineer and principal of HydroScience with 32 years of experience, including complex upgrades to wastewater treatment and collection infrastructure. He served as project manager for the District's recent Arnold and Copper Cove WWTF improvement projects.

Project Commitment: 20% **Location:** Sacramento

Key Tasks: Overall project delivery, scope, and project management. Bill will be the District's main point of contact and will be involved in day-to-day project activities, providing the vision the project requires and working with key personnel to ensure the project's overall success.

Curtis Lam, PE – Principal-in-Charge and QA/QC

As Principal of the Berkeley office, Curtis has 30 years of experience in the areas of wastewater treatment plant process optimization, water recycling, and water resources.

Project Commitment: 2% **Location:** Berkeley

Key Tasks: Dedicate and commit staffing resources, monitor project progress and conformance to the agreement, and will provide backup support to Bill as needed. He will also provide QA/QC services for the project. Curtis will be a secondary point of contact for the District.

Jory Benitez, Grade T2 – Process Engineering

Jory has five years of experience in the planning and design of water, recycled water, and wastewater conveyance and treatment systems. Jory is designing the tertiary treatment and pumping facilities for Copper Cove and worked with Bill on several other recent tertiary wastewater treatment design projects. She has an M.S. in Water Engineering from Cal Poly San Luis Obispo and is a Grade T2 Water Treatment Operator.

Project Commitment: 30% **Location:** Sacramento

Key Tasks: Develop calculations, equipment selections, and design for biological and clarification processes. Prepare plans and specifications.

Bya Founas – Mechanical Engineering

Bya has 15 years of experience in planning, design, and construction of water and wastewater treatment plants, pipelines, and pump stations, including both the Copper Cove and Arnold WWTFs for the District. She brings international experience and expertise in a wide variety of wastewater process designs.

Project Commitment: 30% **Location:** Berkeley

Key Tasks: Develop calculations, equipment and piping selections, and design for pumping, flow splitting, and yard piping. Perform mechanical piping layouts and the hydraulic profile. Prepare plans and specifications.

Marc Fernandez – Civil/Site and Pipelines

Marc has 19 years of experience in planning, design, agency coordination, and field support for pipelines, pump stations, and related water/wastewater infrastructure. He also has experise in roadway design including grading, street improvement, drainage, and related permitting. He is assisting with civil grading design on the Copper Cove WWTF.

Project Commitment: 25% **Location:** Sacramento

Key Tasks: Develop civil grading and paving sheets and the design of the recycled water pipeline to the LESP.

Thinh Le – Electrical, Instrumentation & Controls

Thinh has 21 years of experience as EI&C engineer on complex WWTP improvements. He has an extensive working knowledge of electrical project development including analysis, SCADA systems, network and communication security, industrial automation controls, emergency and standby power, and electrical power systems. He worked on both the Arnold and Copper Cove projects.

Project Commitment: 15% **Location:** Sacramento

Key Tasks: Oversee preparation of electrical, instrumentation & controls (EIC) plans and specifications and develop a construction sequencing plan to perform upgrades around existing operations.

Note: Electrical and drafting support staff represent an additional 55% labor commitment.

Subconsultants

HydroScience has supplemented the project team with four subconsultant firms, all of which have worked with HydroScience recently. We know these firms to be dependable and perform high-quality work. Resumes for subconsultant team leads can be found in the appendix.

PCSG – Cost Estimating

Pre-Construction Services Group, LLC (PCSG) is an Estimating, Consulting and Construction Management firm located in Northern Nevada and serving the western United States. PCSG is a licensed contractor with the knowledge of cost estimation, construction management, design evolution, permitting, public relations, and construction expertise to provide immediate value and cost savings on projects both large and small. PCSG's President, John Collins, has been in the construction industry for over 28 years. PCSG has worked directly with the District to perform an independent estimate for the Arnold project.

VE Solutions – Structural Engineering

VE Solutions is a full service structural engineering firm that designs cost-effective engineering solutions for steel, concrete, prestressed concrete, masonry and wood buildings and structures, as well as rehabilitation of existing damaged structures. Brad Friederichs has 38 years of experience as a structural enigneer and regularly provides subconsultant services to HydroScience on wastewater treatment projects.

O'Dell Engineering – Surveying

O'Dell Engineering will provide surveying services for the project. Founded in 1994, O'Dell offers civil engineering, land surveying, landscape architecture, and land use entitlement & land planning divisions. The firm is a California Certified Small Business and has offices in Modesto, Fresno, Merced, Pleasanton, and Palo Alto. Scott Roberts has 13 years of exprience in land surveying.

Blackburn Consulting – Geotechnical Engineering

Blackburn Consulting provides geotechnical and geo-environmental consulting, materials testing, construction inspection, and forensic engineering services. Blackburn is a certified small business with offices in West Sacramento, Auburn, and Fresno. Robert Pickard is a senior engineering geologist with 22 years of experience.

Section D

PROJECT SCHEDULE

HydroScience has developed this preliminary detailed project schedule based on RFP requirements, the District's schedule objectives, and our recent experience with similar projects.

The RFP indicates notice to proceed on July 10, 2024. HydroScience will conduct an all-hands project kickoff meeting and facility visit at the project site and District offices. Field investigations will be initiated alongside of the PDR development and alternatives evaluation activities. Two workshops are planned during PDR development to vet preliminary results with District staff and ask questions. This will be supplemented by bi-weekly coordination meetings as required.

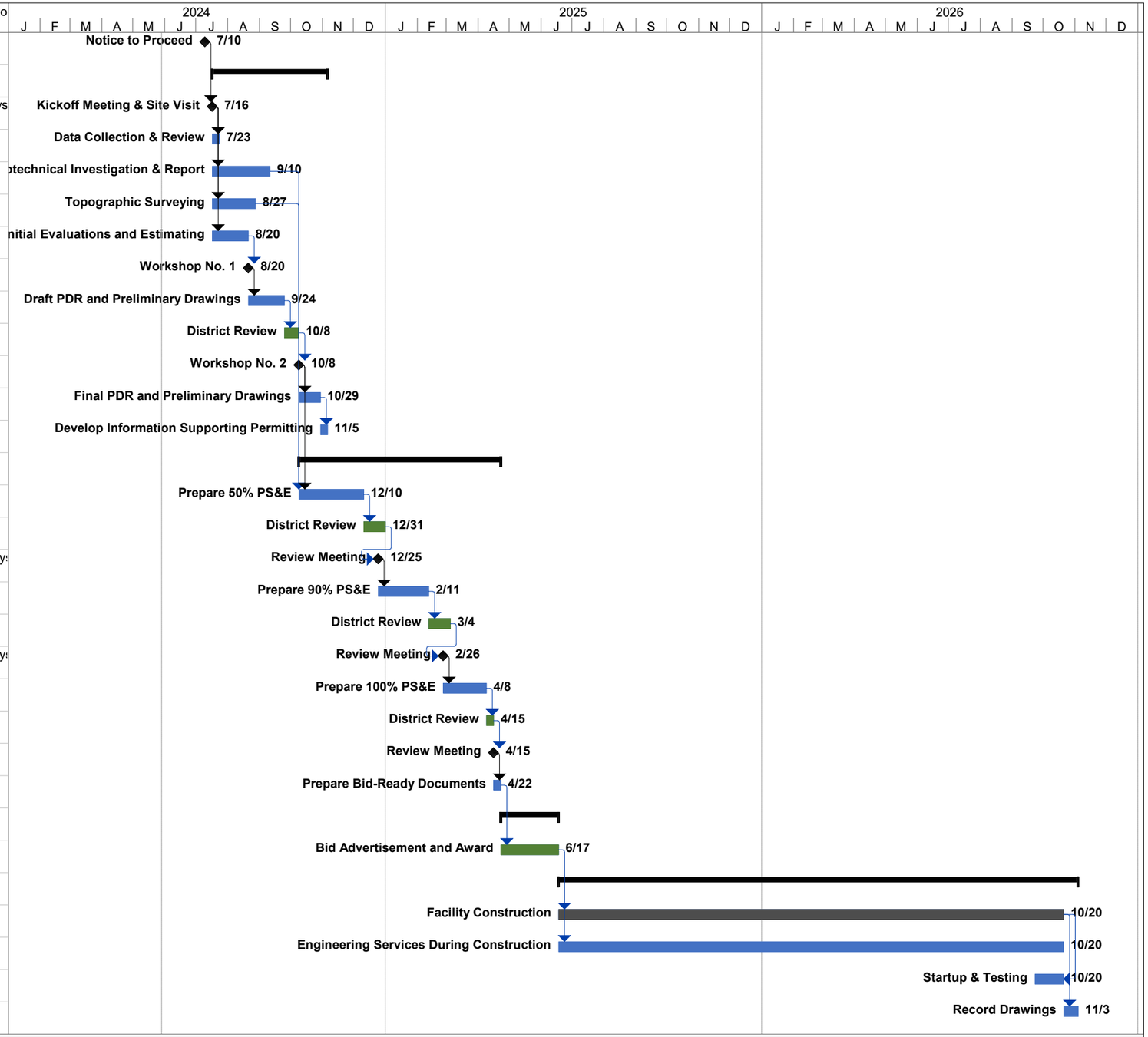
The 50% design can begin while the PDR is being finalized incorporating District comments. Each design milestone will include a review meeting/workshop to discuss District comments and confirm the path forward. We anticipate completing bid-ready documents by April 2025, one month earlier than shown in the RFP schedule.

Project bidding would occur between May and June 2025. Long lead items such as electrical panels, the standby generator, and the control panel are anticipated to take around 60 weeks for submittals, fabrication, and shipping. We have allotted 72 weeks in this schedule for construction, encompassing the 2026 dry season.

Not shown in the schedule are Regional Water Board permitting and CEQA clearance. We understand these are being handled by others but have included hours to supply technical project definition information to both activities and review drafts. We antipcate these will progress in parallel with our work, and we will set the project definition early in the 50% design timeline. We can add these outside activities to our master schedule once they are defined.

Project Schedule

ID	Task Name	Duration	Start	Finish	Predecesso
1	Notice to Proceed	0 days	Wed 7/10/24	Wed 7/10/24	
2	**Preliminary Design Phase**	**80 days**	**Tue 7/16/24**	**Tue 11/5/24**	
3	Kickoff Meeting & Site Visit	0 days	Tue 7/16/24	Tue 7/16/24	1FS+5 days
4	Data Collection & Review	5 days	Wed 7/17/24	Tue 7/23/24	3
5	Geotechnical Investigation & Report	40 days	Wed 7/17/24	Tue 9/10/24	3
6	Topographic Surveying	30 days	Wed 7/17/24	Tue 8/27/24	3
7	Initial Evaluations and Estimating	25 days	Wed 7/17/24	Tue 8/20/24	3
8	Workshop No. 1	0 days	Tue 8/20/24	Tue 8/20/24	7
9	Draft PDR and Preliminary Drawings	25 days	Wed 8/21/24	Tue 9/24/24	8
10	District Review	10 days	Wed 9/25/24	Tue 10/8/24	9
11	Workshop No. 2	0 days	Tue 10/8/24	Tue 10/8/24	10
12	Final PDR and Preliminary Drawings	15 days	Wed 10/9/24	Tue 10/29/24	11
13	Develop Information Supporting Permitting	5 days	Wed 10/30/24	Tue 11/5/24	12
14	**Detailed Design Phase**	**140 days**	**Wed 10/9/24**	**Tue 4/22/25**	
15	Prepare 50% PS&E	45 days	Wed 10/9/24	Tue 12/10/24	11,5,6
16	District Review	15 days	Wed 12/11/24	Tue 12/31/24	15
17	Review Meeting	0 days	Wed 12/25/24	Wed 12/25/24	16FS-5 days
18	Prepare 90% PS&E	35 days	Wed 12/25/24	Tue 2/11/25	17
19	District Review	15 days	Wed 2/12/25	Tue 3/4/25	18
20	Review Meeting	0 days	Wed 2/26/25	Wed 2/26/25	19FS-5 days
21	Prepare 100% PS&E	30 days	Wed 2/26/25	Tue 4/8/25	20
22	District Review	5 days	Wed 4/9/25	Tue 4/15/25	21
23	Review Meeting	0 days	Tue 4/15/25	Tue 4/15/25	22
24	Prepare Bid-Ready Documents	5 days	Wed 4/16/25	Tue 4/22/25	23
25	**Bid Phase**	**40 days**	**Wed 4/23/25**	**Tue 6/17/25**	
26	Bid Advertisement and Award	40 days	Wed 4/23/25	Tue 6/17/25	24
27	**Construction Phase**	**360 days**	**Wed 6/18/25**	**Tue 11/3/26**	
28	Facility Construction	70 wks	Wed 6/18/25	Tue 10/20/26	26
29	Engineering Services During Construction	70 wks	Wed 6/18/25	Tue 10/20/26	26
30	Startup & Testing	20 days	Wed 9/23/26	Tue 10/20/26	28FF
31	Record Drawings	10 days	Wed 10/21/26	Tue 11/3/26	28



CCWD La Contenta WWTF Improvem
Proposed Project Schedule
5/30/2024

Task | Milestone | Summary | District Task | Contractor Task

Section E

REPRESENTATIVE PROJECT EXPERIENCE

Experience Overview

This section includes descriptions of recent, related projects designed by HydroScience. We show the process design elements, HydroScience's role, a client reference, and the overlapping team members. We encourage the District to reach out to our references about their experiences with HydroScience, as they can attest to the ability of these team members to apply expertise and creativity to deliver optimized infrastructure solutions that meet our clients' long-term objectives.

Similarities among the projects featured in this section include:

- **Local knowledge and understanding.** HydroScience is based in Northern California and has worked on several recent projects in this region including the District's Arnold Wastewater Treatment Facility and Copper Cove Wastewater Treatment Facility. We understand District standards and priorities, which means we will be able to start work immediately, collaborate effectively, and navigate the challenges of this project without a learning curve, ultimately saving the District time and money.
- **Experience with complex WWTP process design improvements.** Wastewater treatment infrastructure design is one of HydroScience's core services. We have designed treatment process upgrades to large and small wastewater treatment facilities across California. We work closely with our client's project managers and O&M staff to optimize project cost, incorporate O&M flexibility, strategically sequence construction activities, and avoid unexpected changes or delays.
- **Key staff participation.** Every project featured in this section was completed by key members of our proposed team. Our team works together very effectively and has developed the knowledge and experience needed to find creative solutions to efficiently execute this project.

Copper Cove WWTF Tertiary and Pond 6 Utilities Upgrades

Calaveras County Water District, Calaveras County

YEARS THE WORK WAS PERFORMED
2022 – ongoing

PROCESS DESIGN COMPONENTS
- Filtration pre-treatment (suspended air flotation)
- Continuous backwash sand filtration
- Belt press sludge dewatering
- Horizontal centrifugal pump station
- Submersible centrifugal pump station
- New utility power service and power distribution equipment
- New diesel standby generator
- PLC and SCADA controls

FIRM'S ROLE
Preliminary and Final Design, Construction Support, Funding Assistance, CEQA

PRIMARY CONTACT
Mark Rincon-Ibarra, *District Engineer*
Calaveras County Water District
(209) 754-3175
markr@ccwd.org

TEAM MEMBERS
Bill Slenter, *Project Manager*
Curtis Lam, *Principal-in-Charge & QA/QC*
Jory Benitez, *Project Engineer*
Bya Founas, *Project Engineer*
Marc Fernandez, *Civil/Site and Pipelines*
Thinh Le, *Electrical Engineer*
VE Solutions, *Structural*

The Calaveras County Water District (CCWD) Copper Cove Wastewater Treatment Facility serves approximately 2,000 sewer connections in the communities of Copper Cove, Conner Estates, Copper Meadows, Saddle Creek, and Lake Tulloch. The facility treats mostly domestic wastewater in a series of aerated ponds and storage ponds. Secondary effluent is stored in a large effluent storage pond, Pond 6. Water from this pond is treated to Title 22 tertiary recycled water standards using a Trident Microfloc filter, disinfected in a single-channel UV disinfection process, and delivered to the Saddle Creek Golf Course for irrigation reuse with a portion discharged to wetlands. These discharges are regulated by WDR and NPDES discharge permits.

The filter is approaching the end of its useful life, and typically performs well under design capacity due to high algae load from the pond which requires high chemical doses and frequent backwashing and reduces the UV transmittance (UVT) of filter effluent. Pond 6 also does not have sufficient storage to provide adequate seasonal storage for proposed future development in the area.

HydroScience is preparing a final design to replace the existing filter unit with a continuous backwash sand filtration process, add algae removal pretreatment utilizing suspended air floatation, add a belt press for dewatering tertiary sludge, and relocate pumps and piping at the base of the dam to allow for dam enlargement under a separate construction contract. HydroScience's electrical design team is designing electrical upgrades to support the new facilities including an upgraded power utility service and diesel standby generator. CEQA documentation is also being completed under HydroScience's oversight.

HydroScience is developing the design in close collaboration with CCWD engineering, operations, and maintenance staff. Onsite bench scale testing was performed to validate treatment technology options under very challenging algae load conditions. Expandability provisions for future buildout conditions are being incorporated into the design where appropriate. The construction sequencing strategy to implement the upgrades around ongoing facility operations is a key project element. The project is being funded by the US Army Corps of Engineers under Section 219 of the Water Resource Development Act (WRDA). HydroScience is assisting with this coordination.

Arnold Wastewater Treatment Facility Improvements

Calaveras County Water District, Calaveras County

YEARS THE WORK WAS PERFORMED
2021 – ongoing

PROCESS DESIGN COMPONENTS
- Mixed liquor flow measurement and flow splitting structure
- Circular secondary clarifier
- Double disc WAS/RAS pump station
- Vertical turbine effluent pump
- Aerobic digesters with mechanical mixers and diffusers
- Positive displacement blowers
- New utility power service and power distribution equipment
- New diesel standby generator
- PLC and SCADA controls

FIRM'S ROLE
Preliminary and Final Design, Funding Support, Bidding and Construction Support

PRIMARY CONTACT
Mark Rincon-Ibarra, *District Engineer*
Calaveras County Water District
(209) 754-3175
markr@ccwd.org

TEAM MEMBERS
Bill Slenter, *Project Manager*
Curtis Lam, *Principal-in-Charge, QA/QC*
Bya Founas, *Design Support/Estimating*
Thinh Le, *Electrical Instrumentation and Controls*
VE Solutions, *Structural*

HydroScience provided preliminary and final design of improvements to the Arnold Wastewater Treatment Facility (WWTF) for the Calaveras County Water District (CCWD). The Arnold WWTF is a 175,000 gallons per day (gpd) facility that uses an oxidation ditch, secondary clarifier, pressure filter, and chlorine disinfection to treat to secondary standards. Effluent is discharged to land via both spray irrigation and subsurface infiltration. Sludge is processed in two aerobic digesters and dewatered using a belt press, followed by solar drying. The facility serves 835 equivalent single-family units (ESFUs) and is covered under the General Order for Small Domestic Treatment Systems (WQ-2014-153-DWQ-R5190). The facility lacked unit process redundancy and had insufficient capacity to reliably treat peak wet weather flows. The electrical power distribution was over 35 years old and did not have sufficient capacity to serve an expanded facility.

HydroScience developed the design in close collaboration with CCWD engineering, operations, and maintenance staff. Project improvements include a new 30-ft circular secondary clarifier, a new cast-in-place flow measurement and splitter box with provisions for a future second oxidation ditch, two new aerobic digesters with mechanical mixers and diffusers, a new bank of positive-displacement blowers to feed air to digestion, a new Return Activated Sludge/Waste Activated Sludge (RAS/WAS) pump station using double-disc pumps and control valves, and a new effluent pump station to serve the new clarifier. CCWD decided to expand the project scope by adding complete replacement of the utility power feed, motor control center, SCADA system, and PLC control panel which was completed as a collaborative effort with District staff and their preferred controls engineer.

A new masonry utility building will be constructed to house all new electrical gear including service entrance and MCC. Existing loads will be carefully transitioned to the new MCC through a detailed set of sequencing steps. An upgraded power utility service will be installed to serve the increased loads. A new diesel standby generator will be installed and the existing will be decommissioned.

Following completion of design, CCWD determined that the project could be eligible for State Revolving Fund (SRF) grant funding. As an additional service, HydroScience is preparing the SRF Technical Report and overseeing CEQA documentation development to support funding eligibility.

Memorial Park Wastewater Treatment and Infrastructure Replacement

San Mateo County, California

YEARS THE WORK WAS PERFORMED
2017 – 2021

PROCESS DESIGN COMPONENTS
- Influent lift station with submersible cutter pumps and flow metering
- Influent screening (mechanically cleaned 2mm bar screen)
- 50,000 gpd Sequencing Batch Reactor (SBR) secondary treatment system providing 30 mg/L BOD and TSS effluent with 50% reduction of Total Nitrogen
- Effluent pump station with submersible grinder pumps
- Disinfection using sodium hypochlorite
- New utility power service and power distribution equipment
- New diesel standby generator
- PLC and SCADA controls

FIRM'S ROLE
Planning, Preliminary and Final Design, Engineering Services During Construction, Construction Management and Inspection

PRIMARY CONTACT
Anthony Lum, PE, *Associate Civil Engineer*
County of San Mateo
(650) 599-1491
alum@smcgov.org

TEAM MEMBERS
Bill Slenter, *Project Manager*
Curtis Lam, *Principal-in-Charge*
Thinh Le, *Electrical Instrumentation and Controls*
VE Solutions, *Structural*

Memorial County Park is a family and group campground facility operated by the County of San Mateo and located in the Santa Cruz Mountains. The 500-acre site features dense redwoods, Pescadero Creek, hiking trails, and hosts up to 2,000 visitors per day. The campground is equipped with plumbed restrooms, showers, and limited staff housing.

Wastewater generated within the park is collected in two separate collection systems, with total length of approximately 1.8 miles of 4- to 8-inch gravity sewer. Most of the wastewater flowed to a 30,000 gallon per day (gpd) extended aeration Wastewater Treatment Plant (WWTP). Wastewater was treated to secondary standards, disinfected, and discharged to a dedicated spray field with an unlined retention lagoon to handle larger flows. The remainder of the wastewater flowed to a septic tank and leach field system. The collection system and WWTP were over 50 years old. Due to age, poor performance, reliability concerns, and high maintenance requirements, HydroScience was retained to plan, design, and oversee construction for a new, modern WWTP, rehabilitation of the collection systems, and a new sewer force main and pump station to connect the two collection systems, so that all of the wastewater will be treated by the new WWTP.

HydroScience provided engineering services during construction as well as full time onsite construction management and construction inspection and acted as the Owner's representative on site. Engineering services included submittal, RFIs, and contract change order review. Onsite construction management and inspection included coordination with the Contractor on schedule and construction progress. Construction inspection included quality control of work performed by the contractor, inspection of the work site to maintain environmental compliance, and coordination with HydroScience's subcontractors to perform special inspections such as material inspection of concrete and rebar and earthwork compaction testing. HydroScience helped facilitate the inclusion of a new SCADA system into the design and construction of the wastewater treatment plant at the behest of the Owner after construction had commenced. HydroScience helped the Owner through a two-phase startup of the new wastewater treatment plant: for operations without the SCADA system and then integrated in the SCADA system once installed. Due to the remote nature of the project site and limited real time communications available, emphasis was placed on regularly schedule project meetings to review progress, schedule, and other construction issues.

HydroScience developed a collaborative, forward-looking project approach that provides reliable operation and permit compliance in a small, low-impact footprint, and that reduces the cost and staff time to operate and maintain.

Wastewater Treatment Plant Reliability Improvements

Silicon Valley Clean Water, Redwood City, California

YEARS THE WORK WAS PERFORMED
2018 – 2021

PROCESS DESIGN COMPONENTS
- Aeration turbo blowers, piping, and control valves
- Horizontal centrifugal high flow backwash pumps
- Fan press solids dewatering units with conveyor system
- Electrical, instrumentation, and control panels

FIRM'S ROLE
Design engineer on a design-build team

PRIMARY CONTACT
Arvind Akela, *Engineering Director*
(650) 832-6485
aakela@svcw.org

HydroScience served as engineer-of-record on a design-build team for this project which provided plant reliability improvements for Silicon Valley Clean Water's 24 MGD WWTP in Redwood Shores, California. Work included upgrading the aeration basin blower system to high-speed turbo blowers with all new distribution piping and control valves, correcting basin flow split issues starting with a hydraulic profile study, installing a fan press solids dewatering system and conveyors, adding backup water for generators, and replacing their granular media filter backwash pumps.

Replacement of the backwash pumps was particularly challenging given the large size of the pumps (8,000 gpm), limited shutdown window available, their location in a below-grade gallery, and the custom large-diameter discharge manifold that needed to be replaced to accommodate new pumps.

The D/B project included a highly collaborative process with plant staff. One of the key features of our approach was the partnering atmosphere, which we established at the project kickoff. Client collaboration included a series of all-hands workshops to review findings, select preferred design alternatives, gather feedback on design deliverables, and coordinate construction activities. Installation and testing of improvements were performed in close coordination with plant operations and maintenance staff to sequence the work around ongoing operations while facilitating completion of the contract requirements.

Davis Secondary and Tertiary Improvements

City of Davis, California

YEARS THE WORK WAS PERFORMED
2014 – 2017

PROCESS DESIGN COMPONENTS
- Chlorine contact basin
- Utility water pump station
- Effluent reaeration system
- Commissioning engineering for all facilities including secondary, tertiary, solids handling

FIRM'S ROLE
Design engineer on a design-build team

PRIMARY CONTACT
Art O'Brien, *Advisor for City of Davis*
(916) 714-1801
aobrien@robertson-bryan.com

HydroScience provided process design, coordination, and commissioning assistance as part of a design-build (DB) team for the construction of secondary and tertiary wastewater treatment improvements at the City of Davis WWTP. The peak treatment capacity was increased to 18 MGD by the project. This $70M comprehensive upgrade of this existing WWTP modernized the facility and brought it into compliance with current discharge regulations. Having recently served as the lead engineer on the City's Rehabilitation and Replacement (R&R) project, which upgraded the influent pumping, headworks, grit handling, and primary clarification unit processes, HydroScience contributed a deep working knowledge of existing plant systems and O&M requirements to the DB team.

HydroScience developed a preliminary design, which was subsequently optimized in a team effort with the City, their Owner's Representative, and outside expert peer reviewers. The resulting project definition was then executed in the detailed design phase. The project includes design and construction of activated sludge secondary treatment facilities (aeration and clarification), tertiary disc filters, chlorine disinfection, post-aeration, effluent pumping, flood control facilities, and a new administration building.

The project successfully achieved the City's goal of obtaining a cost-effectively and reliable WWTP upgrade that meets new discharge regulations and is flexible for future regulations while remaining operator-friendly, operationally efficient, and environmentally sustainable.

Section F

LABOR ESTIMATE

Task	Description	Curtis Lam PIC and QA/QC	Bill Slenter Project Manager	Jory Benitez Process Engineering	Marc Fernandez Civil/Site and Pipelines	Bya Founas Mecanical Engineering	Thinh Le Electrical/EIC Lead	Electrical EIC Support	Drafting	Hours	PCSG Cost Estimating	VE Solutions Structural	Blackburn Geotechnical	O'Dell Surveying	Total Project Hours
	Labor Classification	Prin	Prin	E-II	E-III	E-III	E-IX	E-III	CAD						
A	**Project Management/QAQC**	**18**	**40**	**18**	**0**	**5**	**5**	**0**	**0**	**86**	**0**		**0**	**0**	**86**
	General Project Management/Tracking	2	20	8						**30**					**30**
	Bi-Weekly Status Calls		20	10		5	5			**40**					**40**
	QA/QC	16								**16**					**16**
B	**Project Design Report**	**0**	**44**	**71**	**105**	**23**	**62**	**103**	**49**	**457**	**14**		**0**	**0**	**485**
	Kickoff meeting/Comprehensive Site Visit		8	8			8			**24**					**24**
	Data request, review, and collection		1	2	14		20	32		**69**					**69**
	Evaluation and Alternatives		10	20	30					**60**					**60**
	PDR Cost Estimating		1	2	1	1	1	2		**8**	14				**22**
	Workshop 1		4	3		2	1	3		**13**					**13**
	Prepare Preliminary Drawings		2	8	24		12	32	45	**123**					**123**
	Prepare Draft PDR		10	16	24	20	10	26		**106**					**106**
	Workshop 2		4	4			4			**12**					**12**
	Prepare Final PDR		4	8	12		6	8	4	**42**					**42**
	Structural Engineering - Predesign Phase									**0**		14			**14**
C	**Topographic Surveying**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		**0**	**174**	**174**
	Prepare Topographic Survey									**0**				174	**174**
D	**Geotechnical Investigation**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		**130**	**0**	**130**
	Field Investigation and Geotechnical Report									**0**			130		**130**
E	**Permit and Environmental Assistance**	**0**	**6**	**0**	**12**	**0**	**0**	**0**	**0**	**18**	**0**		**0**	**0**	**18**
	Develop Project Description and Data Tables		6		12					**18**					**18**
F	**Project Design**	**0**	**119**	**339**	**173**	**397**	**70**	**333**	**266**	**1697**	**91**		**0**	**0**	**1471**
	Prepare 50% Plans and Draft Technical Specifications		40	140	80	160	12	100	110	**642**					
	Design Review Meeting		4	3		2	1	3		**13**					**13**
	Prepare 90% Plans and Specifications		40	100	60	130	30	160	90	**610**					**610**
	Design Review Meeting		4	3		2	1	3		**13**					**13**
	Prepare 100% Plans and Specifications		24	80	24	100	20	60	40	**348**					**348**
	Design Phase Cost Estimating		1	3	1	1	3	1	2	**12**	91				**103**
	Design Review Meeting		2	2		2	1	2		**9**					**9**
	Prepare Bid-Ready Plans and Specifications		4	8	8		2	4	24	**50**					**50**
	Structural Engineering - Design Phase									**0**		325			**325**
G	**Construction Assistance**	**0**	**36**	**67**	**48**	**72**	**36**	**124**	**24**	**407**	**0**		**0**	**0**	**464**
	Site Visits (4)		8	8			4	8		**28**					**28**
	Construction Meetings (8)		6	4		4	2	4		**20**					**20**
	RFI Responses (35)/General Support		16	16	30	4	10	50		**126**					**126**
	Submittal Responses (75)		4	35	16	60	16	60		**191**					**191**
	Change Order Assistance		2	2		4	4	2		**14**					**14**
	Record Drawings			2	2				24	**28**					**28**
	Structural Engineering Support									**0**		57			**57**
OVERALL BASE SERVICES		**18**	**245**	**495**	**338**	**497**	**173**	**560**	**339**	**2665**	**105**	**396**	**130**	**174**	**2828**
OPTIONAL SERVICES															
	Separate secondary clarifier, RAS/WAS PS		8	24	16	40	4	8	28	**128**		280	7		**415**
	Headwall for UESP suction		2		12				4	**18**		43	3		**64**
	Record of Survey									**0**				105	**105**
	PCSG constructability review		1	2		2	1	2		**8**	29				**37**

Section G

PROJECT TEAM RESUMES

TEAM MEMBER	ROLE	PAGE
Bill Slenter, PE	Project Manager	
Curtis Lam, PE	Principal-in-Charge / QA/QC	
Jory Benitez, EIT, Grade T2	Process Engineering	
Bya Founas, CEng MICE	Mechanical Engineering	
Marc Fernandez	Civil/Site and Pipelines	
Thinh Le, PE	Electrical, Instrumentation & Controls	
John Collins, PCSG	Cost Estimating	
Brad Friedriechs, VE Solutions	Structural Engineering	
Scott Roberts, O'Dell Engineering	Surveying	
Rob Pickard, Blackburn Consulting	Geotechnical Engineering	

Bill Slenter, PE

Project Manager

HydroScience

Bill is a civil engineer with 32 years of experience. His areas of expertise include permitting, funding, planning, design, and construction support of wastewater, water, and recycled water systems, including wastewater treatment facilities producing tertiary effluent. A principal with HydroScience, he has served as principal, project manager and project engineer on a wide range of water-related projects.

EDUCATION
B.S., Civil Engineering, San Francisco State University

REGISTRATION
Civil Engineer, California, Registration No. 57640

AFFILIATIONS
California Water Environment Association (CWEA)

Central Valley Clean Water Association – Outreach Committee Chairperson

Former Chairperson, CWEA San Francisco Bay Section Communications Committee

CWEA Sacramento Area Section

SELECT PROJECT EXPERIENCE

Copper Cove WWTF Tertiary and Pond 6 Utilities Upgrades

Calaveras County Water District, California

Project Manager. The Copper Cove Wastewater Treatment Facility treats mostly domestic wastewater in a series of aerated ponds and storage ponds. Secondary effluent is stored in a large effluent storage pond, Pond 6. Water from this pond is treated to Title 22 tertiary recycled water standards using a Trident Microfloc filter, disinfected in a single-channel UV disinfection process, and delivered to the Saddle Creek Golf Course for irrigation reuse with a portion discharged to wetlands. HydroScience is preparing the design to replace the aging and poorly performing existing filter unit with a continuous backwash sand filtration process, add algae removal pretreatment utilizing suspended air floatation, add solids dewatering for treating tertiary sludge, and relocate pumps and piping. CEQA documentation is also being completed under HydroScience's oversight. Expandability provisions for future buildout conditions are incorporated into the design, and the construction sequencing will implement the upgrades around ongoing facility operations. A separate design package also being prepared by HydroScience will relocate buried piping and two pump stations to make room for enlargement of the Pond 6 dam. HydroScience is also assisting with US Army Corps of Engineers (USACE) grant funding coordination.

Arnold WWTF Improvements

Calaveras County Water District, California

Project Manager. HydroScience provided preliminary and final design of improvements to the Arnold Wastewater Treatment Facility (WWTF) for the Calaveras County Water District (CCWD). The Arnold WWTF is a 175,000 gpd facility that uses an oxidation ditch, secondary clarifier, pressure filter, and chlorine disinfection to treat to secondary standards. The facility currently serves 835 equivalent single-family units (ESFUs) and is covered under the General Order for Small Domestic Treatment Systems (WQ-2014-153-DWQ-R5190). The facility lacked unit process redundancy and experiences reduced clarification performance under peak wet weather flows. The existing electrical power distribution equipment was over 35 years old and did not have sufficient capacity to serve an expanded facility. HydroScience developed the design in close collaboration with CCWD engineering, operations, and maintenance staff. The project added a second secondary clarifier, improved mixed liquor flow control with provisions for a future second oxidation ditch, increased aerobic digestion capacity, replaced the return and waste activated sludge pump station, and upgraded effluent pumping. CCWD decided to expand the project scope by adding complete replacement of the utility power feed, motor control center, SCADA system, and PLC control panel, which was completed as a collaborative effort with District staff and their preferred controls engineer. The design is complete and HydroScience is assisting CCWD with securing State Revolving Fund (SRF) grant funding by preparing a technical report and overseeing completion of CEQA.

Memorial Park Wastewater Treatment Facilities Improvements

County of San Mateo, California

Project Manager. Memorial County Park is a family and group campground facility. Wastewater generated within the park is collected in two separate collection systems, with a total length of approximately 1.8 miles of 4- to 8-inch gravity sewer. Most of the wastewater flowed to a 30,000 gallon per day (gpd)

Bill Slenter, PE

HydroScience

extended aeration WWTP. Wastewater is treated to secondary standards, disinfected, and discharged to a dedicated spray field with an unlined retention lagoon to handle larger flows. The remainder of the wastewater flows to a septic tank and leach field system. The collection system and WWTP were over 50 years old. Due to age, poor performance, reliability concerns, and high maintenance requirements, the County retained HydroScience to plan, design, and oversee construction for a new, modern 50,000 gpd sequencing batch reactor WWTP. The design also included new yard piping and modifications to the existing WWTP, to repurpose it as a new sewer lift station. Site drainage improvements included in the design help to mitigate ponding issues. HydroScience developed a collaborative, forward-looking project approach that provides reliable operation and permit compliance in a small, low-impact footprint, and that reduces the cost and staff time to operate and maintain.

Wastewater Treatment Plant Reliability Improvements

Silicon Valley Clean Water, Redwood City, California

Principal-in-Charge and QA/QC. HydroScience was the engineer-of-record for the Overaa/HydroScience design-build team for this design-build project to provide plant reliability improvements for Silicon Valley Clean Water's 24 MGD WWTP in Redwood Shores, California. Work included upgrading the aeration basin blower system to high speed turbo blowers with all new distribution piping and control valves, correcting basin flow split issues, installing a fan press solids dewatering system and conveyors, and replacing their granular media filter backwash pumps. Electrical improvements included installing new VFDs and turbo blower, enhancing the aeration control, installing new rotary presses with an integrated control scheme that allowed for redundant control/ power systems, replacing 125 HP Dual Media Filter Backwash Pump with more efficient pump while maintaining the existing power draw and updating the process control narratives.

Wastewater Treatment Plant Rehabilitation and Replacement

City of Davis, California

Principal-in-Charge. HydroScience provided design and construction support services for the City's WWTP Rehabilitation and Replacement Project. The project included significant upgrades to the existing dry pit influent pumps, which were oversized for current flows and had significant O&M challenges. The improvements included revised suction piping, new pumps, and a revised discharge piping arrangement. The improved facility operates at a higher efficiency with flow turndown and reduced incidence of clogging. Headworks improvements include new bar screens and washer/compactors, as well as modifications to existing influent channels to improve scour velocity to reduce maintenance and corrosion. Primary clarifier improvements include new chain and flight scrapers equipment.

Davis WWTP Secondary and Tertiary Improvements

City of Davis, California

Principal-in-Charge. HydroScience provided process design, coordination, and commissioning assistance as part of a design-build team for the construction of secondary and tertiary improvements at the City's WWTP. The peak treatment capacity is 18 MGD. This $70M upgrade modernized the facility and brought it into compliance with current discharge regulations. The project included design and construction of activated sludge secondary treatment facilities (aeration and clarification), tertiary disc filters, chlorine disinfection, post-aeration, effluent pumping, flood control facilities, and a new administration building. HydroScience's core areas of responsibility on this project included the chlorine contact basin, chemical mixers, chlorine residual monitors, utility water systems, effluent reaeration system, field instrumentation, leading roles on commissioning and process transitioning, and support for plant tie-ins and owner coordination.

St. Helena WWTRP Upgrades

City of St. Helena, California

QA/QC. The City of St. Helena was issued a CDO containing effluent limitations the City could not reliably obtain with their existing pond treatment plant. The City commissioned HydroScience Engineers to develop a Conceptual Design Report (CDR) to analyze treatment alternatives that would comply with the new NPDES effluent discharge limitations, while also modernizing the facility's treatment process. HydroScience identified a packaged MBR treatment system as the preferred WWTRP upgrade alternative, and developed the design around this approach. The WWTRP will maintain its permitted capacity of 0.5 MGD with the flexibility to operate the plant at a peak day hydraulic capacity of 1.33 MGD. This new system will result in tens of millions of dollars in cost savings when combined with repurposing four of the existing WWTRP ponds for use as flow equalization. The design is modular so that the City can cost-effectively expand the new system to meet anticipated build-out flows, if necessary. The RWQCB accepted the CDR findings without comment. Construction is nearly completed.

Wastewater Treatment and Effluent Management Facilities

Lytton Rancheria, Sonoma County, California

Design Manager. As part of a design/build team, HydroScience completed design of a Membrane Bioreactor (MBR) Wastewater Treatment Facility to serve a new tribal residential development in Sonoma County. The design includes an administration building, UV disinfection, solids dewatering system, effluent storage pond, and recycled water pump station. The design was developed through a collaborative progressive design build process. Construction is completed and the facility is being commissioned.

Curtis Lam, PE

Principal-in-Charge and QA/QC

HydroScience

Curtis Lam has 30 years of experience in the design of recycled water and potable water distribution system infrastructure, wastewater treatment and collection system design, and the master planning of water, wastewater, and recycled water infrastructure. A Principal with HydroScience, Curtis has served as Principal-in-Charge, Project Manager and Project Engineer on a wide range of water, wastewater, and recycled water projects.

EDUCATION

M.S., Civil and Environmental Engineering, University of California, Berkeley (1996)

B.S., Civil Engineering, University of California, Berkeley (1995)

REGISTRATION

Civil Engineer, California, Registration No. 59049 (1999)

AFFILIATIONS

WateReuse Association, Representative to the Board of Trustees, 2017 - 2020

WateReuse Association, President, 2015 - 2016

WateReuse Association, Vice-President, 2013 - 2014

WateReuse Association, Program Chair, 2011 - 2013

WateReuse, Chair, 2013 California Annual Conference

California Water Environment Association

Water Environment Federation

SELECT PROJECT EXPERIENCE

Copper Cove WWTF Tertiary and Pond 6 Utilities Upgrades

Calaveras County Water District, California

Principal-in-Charge & QA/QC. The Copper Cove Wastewater Treatment Facility treats mostly domestic wastewater in a series of aerated ponds and storage ponds. Secondary effluent is stored in a large effluent storage pond, Pond 6. Water from this pond is treated to Title 22 tertiary recycled water standards using a Trident Microfloc filter, disinfected in a single-channel UV disinfection process, and delivered to the Saddle Creek Golf Course for irrigation reuse with a portion discharged to wetlands. HydroScience prepared a preliminary and final design to replace the existing filter unit with a continuous backwash sand filtration process, add algae removal pretreatment utilizing dissolved air floatation, add solids dewatering for treating tertiary sludge, and relocate pumps and piping. CEQA documentation was also completed under HydroScience's oversight. Expandability provisions for future buildout conditions were incorporated into the design, and the construction sequencing implemented the upgrades around ongoing facility operations.

Arnold WWTF Improvements

Calaveras County Water District, California

Principal-in-Charge & QA/QC. HydroScience provided preliminary and final design of improvements to the Arnold Wastewater Treatment Facility (WWTF) for the Calaveras County Water District (CCWD). The Arnold WWTF is a 175,000 gpd facility that uses an oxidation ditch, secondary clarifier, pressure filter, and chlorine disinfection to treat to secondary standards. The facility currently serves 835 equivalent single-family units (ESFUs) and is covered under the General Order for Small Domestic Treatment Systems (WQ-2014-153-DWQ-R5190). The facility lacked unit process redundancy and experiences reduced clarification performance under peak wet weather flows. The existing electrical power distribution equipment was over 35 years old and did not have sufficient capacity to serve an expanded facility. HydroScience developed the design in close collaboration with CCWD engineering, operations, and maintenance staff. The project added a second secondary clarifier, improved mixed liquor flow control with provisions for a future second oxidation ditch, increased aerobic digestion capacity, replaced the return and waste activated sludge pump station, and upgraded effluent pumping. CCWD decided to expand the project scope by adding complete replacement of the utility power feed, motor control center, SCADA system, and PLC control panel, which was completed as a collaborative effort with District staff and their preferred controls engineer. The design is complete and HydroScience is assisting CCWD with securing State Revolving Fund (SRF) grant funding by preparing a technical report and overseeing completion of CEQA.

Memorial Park Wastewater Treatment Facilities Improvements

County of San Mateo, California

Principal-in-Charge. Memorial County Park is a family and group campground facility. Wastewater generated within the park is collected in two separate collection systems, with a total length of approximately 1.8 miles of 4- to 8-inch gravity sewer. Most of the wastewater flows to a 30,000 gallon per day (gpd) extended aeration WWTP. Wastewater is treated to secondary standards, disinfected, and discharged to a dedicated spray field with an unlined retention lagoon to handle larger flows. The remainder of the

Curtis Lam, PE

HydroScience

wastewater flows to a septic tank and leach field system. The collection system and WWTP are over 50 years old. Due to age, poor performance, reliability concerns, and high maintenance requirements, HydroScience planned, designed, and oversaw construction for a new, modern 50,000 gpd sequencing batch reactor WWTP. The design included new yard piping and modifications to the existing WWTP, to repurpose it as a new sewer lift station. HydroScience developed a collaborative, forward-looking project approach that provides reliable operation and permit compliance in a small, low-impact footprint, and that reduces the cost and staff time to operate and maintain.

St. Helena WWTRP Upgrades

City of St. Helena, California

Project Manager. The City of St. Helena was issued a CDO containing effluent limitations the City could not reliably obtain with their existing pond treatment plant. The City commissioned HydroScience Engineers to develop a Conceptual Design Report (CDR) to analyze treatment alternatives that would comply with the new NPDES effluent discharge limitations, while also modernizing the facility's treatment process. HydroScience identified a packaged MBR treatment system as the preferred WWTRP upgrade alternative, and developed the design around this approach. The WWTRP will maintain its permitted capacity of 0.5 MGD with the flexibility to operate the plant at a peak day hydraulic capacity of 1.33 MGD. This new system will result in tens of millions of dollars in cost savings when combined with repurposing four of the existing WWTRP ponds for use as flow equalization. The design is modular so that the City can cost-effectively expand the new system to meet anticipated build-out flows, if necessary. The RWQCB accepted the CDR findings without comment.

Wastewater Treatment Plant Upgrades

City of Greenfield, California

Project Manager. The City of Greenfield WWTP provides wastewater services to 3,800 connections. In order to meet RWQCB's recently adopted waste discharge requirements, the aging plant requires a new wastewater treatment process. Recent studies recommended a prepackaged 2.0 MGD MBR system that would replace the existing secondary treatment process. The City retained HydroScience to perform the planning, design, obtain $60M in CWSRF external funding, and construction phase services for this groundbreaking project on the Central Coast. Design of this project will be completed during 2024, with constructed scheduled for 2026.

Wastewater Treatment and Effluent Management Facilities

Lytton Rancheria, Sonoma County, California

Design Quality Manager/Design Principal. As part of a design/build team, HydroScience completed design and is in the process of completing construction of wastewater and recycled water facilities serving a new tribal residential development in Sonoma County. The Lytton Rancheria project consists of construction of new homes, a community center, and a retreat center. HydroScience designed a complete Membrane Bioreactor (MBR) Wastewater Treatment Facility utilizing shop-fabricated treatment units to treat 250,000 gpd of peak dry weather flow. The design includes an administration building, UV disinfection, solids dewatering system, effluent storage pond, and recycled water pump station. The design was developed through a collaborative progressive design build process.

Package MBR Wastewater Treatment Plant

Chicken Ranch Rancheria of Me-Wuk Indians, Tuolumne County

Project Manager. HydroScience was recently retained by Chicken Ranch Rancheria to design a new MBR WWTP capable of producing disinfected tertiary recycled water suitable for unrestricted reuse. Dry weather flows into the plant are expected to increase from 104,000 gpd during Phase 1 to 165,000 gpd at buildout. Components of the new WWTP will include an influent pump station a Cloacina M300-200 membrane bioreactor wastewater treatment plant, a Drypac sludge dewatering press, UV disinfection reactors, an effluent pump station, and a SCADA control system. This project was implemented by a design build team with Fluid Resource Management as the Contractor and HydroScience as the Engineer-of-Record.

Tule River Tertiary Wastewater System Facilities

Tule River Tribe, Porterville, California

Project Manager. HydroScience has been retained by the Tule River Tribe to design and provide permitting and funding support for a new Water Recycling Treatment Plant, recycled water storage and conveyance infrastructure, and offsite wastewater collection system improvements in the City of Porterville, California. The project objective is to offset the potable water demand associated with the Tribe's proposed Eagle Mountain Casino and Resort Relocation Project in accordance with mandated CEQA requirements. The City of Porterville currently does not treat wastewater to tertiary standards therefore; an agreement between the Tribe and City will permit the production of recycled water using the City's existing WWTP outfall. The project includes the design and construction of a new 0.308 MGD ultrafiltration plant, 0.5 MG steel storage tank, 900 gpm vertical turbine pump station, 7,000 linear feet of 12 inch PVC recycled water distribution piping, electrical and SCADA improvements, civil site improvements including a new access road, and the irrigation retrofit of the City's existing sports complex for permitted reuse of recycled water. Offsite improvements include the replacement of two existing sanitary sewer lift stations and collection system improvements. Challenges include a fast-track schedule and the need to streamline the permitting process.

Jory Benitez, EIT, Grade T2

Process Engineering

HydroScience

EDUCATION

M.S., Engineering with a Specialization in Water Engineering, California Polytechnic State University, San Luis Obispo

B.S., Environmental Engineering, California Polytechnic State University, San Luis Obispo

REGISTRATION

Engineer-in-Training, California, Registration No. 151168

Grade T2 Water Treatment Operator, No. 40518, California

AFFILIATIONS

American Water Works Association since 2019
Member No. 03560224

National Association of Lambda Alumnae

Jory is a support engineer with five years of experience in the planning and design of water, recycled water, and wastewater conveyance and treatment systems. Her educational experience includes planning and design of water wells and pump stations as well as agricultural irrigation systems. Jory has had key roles in chlorine disinfection system tracer studies, regulatory compliance, wastewater feasibility studies, and recycled water pipeline planning and design. Her software experience includes AutoCAD and ArcGIS.

SELECT PROJECT EXPERIENCE

Copper Cove WWTF Tertiary and Pond 6 Utilities Upgrades

Calaveras County Water District, California

Project Engineer. The Copper Cove Wastewater Treatment Facility treats mostly domestic wastewater in a series of aerated ponds and storage ponds. Secondary effluent is stored in a large effluent storage pond, Pond 6. Water from this pond is treated to Title 22 tertiary recycled water standards using a Trident Microfloc filter, disinfected in a single-channel UV disinfection process, and delivered to the Saddle Creek Golf Course for irrigation reuse with a portion discharged to wetlands. HydroScience is preparing the design to replace the aging and poorly performing existing filter unit with a continuous backwash sand filtration process, add algae removal pretreatment utilizing suspended air floatation, add solids dewatering for treating tertiary sludge, and relocate pumps and piping. CEQA documentation is also being completed under HydroScience's oversight. Expandability provisions for future buildout conditions are incorporated into the design, and the construction sequencing will implement the upgrades around ongoing facility operations. A separate design package also being prepared by HydroScience will relocate buried piping and two pump stations to make room for enlargement of the Pond 6 dam. HydroScience is also assisting with US Army Corps of Engineers (USACE) grant funding coordination.

St. Helena WWTRP Upgrades

City of St. Helena, California

Project Engineer. The City of St. Helena was issued a CDO containing effluent limitations the City could not reliably obtain with their existing pond treatment plant. The City commissioned HydroScience Engineers to develop a Conceptual Design Report (CDR) to analyze treatment alternatives that would comply with the new NPDES effluent discharge limitations, while also modernizing the facility's treatment process. HydroScience identified a packaged MBR treatment system as the preferred WWTRP upgrade alternative, and developed the design around this approach. The WWTRP will maintain its permitted capacity of 0.5 MGD with the flexibility to operate the plant at a peak day hydraulic capacity of 1.33 MGD. This new system will result in tens of millions of dollars in cost savings when combined with repurposing four of the existing WWTRP ponds for use as flow equalization. The design is modular so that the City can cost-effectively expand the new system to meet anticipated buildout flows, if necessary. The RWQCB accepted the CDR findings without comment. Construction is nearly completed.

Wastewater Treatment and Effluent Management Facilities

Lytton Rancheria, Sonoma County, California

Support Engineer. As part of a design/build team, HydroScience completed design of wastewater and recycled water facilities serving a new tribal residential development in Sonoma County. The Lytton Rancheria project consists of construction of new homes, a community center, and a retreat center. HydroScience designed a complete Membrane Bioreactor (MBR) Wastewater Treatment Facility utilizing shop-fabricated treatment units to treat 250,000 gpd of peak dry weather flow. The design includes an administration building, UV disinfection, solids dewatering system, effluent storage pond, and recycled water pump station. The design was developed through a collaborative progressive design build process.

Jory Benitez, EIT, Grade T2

HydroScience

Water Treatment and Storage Facility

Lytton Rancheria, Sonoma County, California

Support Engineer. HydroScience is providing design engineering and engineering support of construction for new groundwater wells, groundwater treatment, treated water storage, and booster pumping facility to serve the Lytton Rancheria Project, a tribal residential development located near Windsor, CA. HydroScience's role is design engineer-of-record as part of a design/build project team. The facility will produce an average day flow of approximately 120K gpd at buildout. New wells will deliver raw water to a water treatment system to reduce concentrations of arsenic and manganese in the groundwater to below primary maximum contaminant levels. The treatment process will include pH adjustment, oxidation, coagulation/filtration, post-filtration adsorption, and backwash thickening. Dosing of sodium hypochlorite followed by storage in on-site welded steel storage tanks will follow. A booster pump station consisting of banks of low and high flow pumps followed by a hydropneumatic tank will deliver water to the distribution system for residential demands and fire flows. The treatment and pumping equipment will be housed in a new CMU building, which will also contain an operations office, lab, power distribution, and control systems. The design phase has been completed and HydroScience will provide construction phase support including review of RFIs and submittals, field visits, and commissioning support.

Red Hawk Casino Wastewater Treatment Plant Expansion Project Wastewater Feasibility Study

Shingle Springs Rancheria, El Dorado County, California

Project Engineer. Jory developed the wastewater feasibility study which included: researching existing site and operational conditions and design parameters of facilities; estimating additional flows from expansion project; developing a water balance to determine the existing capacity of the recycled water and wastewater treatment plant distribution system; analyzing the existing demands of the disposal sites for recycled water; and, developing a report and providing a summary of findings and recommendations.

Tule River Tertiary Wastewater System Facilities

Tule River Tribe, City of Porterville, California

Project Engineer. HydroScience has been retained by the Tule River Tribe to design and provide permitting and funding support for a new Water Recycling Treatment Plant, recycled water storage and conveyance infrastructure, and offsite wastewater collection system improvements in the City of Porterville, California. The project objective is to offset the potable water demand associated with the Tribe's proposed Eagle Mountain Casino and Resort Relocation Project in accordance with mandated CEQA requirements. The City of Porterville currently does not treat wastewater to tertiary standards therefore; an agreement between the Tribe and City will permit the production of recycled water using the City's existing WWTP outfall. The project includes the design and construction of a new 0.308 MGD ultrafiltration plant, 0.5 MG steel storage tank, 900 gpm vertical turbine pump station, 7,000 linear feet of 12 inch PVC recycled water distribution piping, electrical and SCADA improvements, civil site improvements including a new access road, and the irrigation retrofit of the City's existing sports complex for permitted reuse of recycled water. Offsite improvements include the replacement of two existing sanitary sewer lift stations and collection system improvements. Challenges include a fast-track schedule and the need to streamline the permitting process.

Recycled Water Packaged Membrane Treatment System

City of Hayward, California

Project Engineer. HydroScience provided detailed design, bid, and construction phase support for a new microfiltration and chlorine disinfection tertiary treatment plant, which supplies up to 0.5 MGD of disinfected tertiary treated water to the City's recycled water distribution system. The facilities consist of a feed pump station, microfiltration system, sodium hypochlorite storage and feed system, recycled water disinfection and storage, and electrical and control systems.

Water Supply Assessment

City of Foster City/Estero Municipal Improvement District, California

Project Engineer. The City of Foster City received a proposal for construction of a new, four-story life sciences office building and associated site improvements at the former El Torito restaurant at the intersection of Vintage Park Drive and Chess Drive at the municipal boundary between Foster City and San Mateo. The proposed project will need to comply with the requirements of the California Environmental Quality Act (CEQA) and the City has elected to also conduct a Water Supply Assessment (WSA) in accordance with the requirements of Senate Bill 610 (SB 610).

2020 Urban Water Management Plan

City of Santa Clara, California

Project Engineer. HydroScience prepared the 2020 Urban Water Management Plan (UWMP) Update for the City of Santa Clara. HydroScience worked with the City to examine its current and projected water supplies, demands, and sources; coordinate with BAWSCA; outline the City's conservation efforts; and comprehensive update of the water shortage contingency plan for compliance with new, more prescriptive legislative requirements. HydroScience prepared the announcements for public notification, documentation necessary for submittal to the Department of Water Resources (DWR) and completed online submittal of data through DWR's online submittal tool.

Bya Founas, CEng MICE

Mechanical Engineering

HydroScience

Bya is a project engineer with 15 years of experience in planning, design and construction of water and wastewater treatment plants, pipelines, pump stations and storage tanks as well as pipeline hydraulic studies. She also has worked on major international water and conveyance projects and has a wide experience on different water and wastewater process designs. Bya has experience leading multidisciplinary teams to overcome design and construction challenges and meet tight deadlines and budgets.

EDUCATION
MSc Civil Engineering for Development, University of Southampton, United Kingdom

BEng Civil Engineering, University of Brighton, United Kingdom

BEng Civil Engineering, University of Joseph Fourier, France

REGISTRATION
CEng MICE, 61482771, Chartered Member of the ICE

AFFILIATION
North California Pipe User Group (PUG)

SELECT PROJECT EXPERIENCE

Copper Cove WWTF Tertiary and Pond 6 Utilities Upgrades

Calaveras County Water District, California

Project Engineer. The Copper Cove Wastewater Treatment Facility treats mostly domestic wastewater in a series of aerated ponds and storage ponds. Secondary effluent is stored in a large effluent storage pond, Pond 6. Water from this pond is treated to Title 22 tertiary recycled water standards using a Trident Microfloc filter, disinfected in a single-channel UV disinfection process, and delivered to the Saddle Creek Golf Course for irrigation reuse with a portion discharged to wetlands. HydroScience is preparing the design to replace the aging and poorly performing existing filter unit with a continuous backwash sand filtration process, add algae removal pretreatment utilizing suspended air floatation, add solids dewatering for treating tertiary sludge, and relocate pumps and piping. CEQA documentation is also being completed under HydroScience's oversight. Expandability provisions for future buildout conditions are incorporated into the design, and the construction sequencing will implement the upgrades around ongoing facility operations. A separate design package also being prepared by HydroScience will relocate buried piping and two pump stations to make room for enlargement of the Pond 6 dam. HydroScience is also assisting with US Army Corps of Engineers (USACE) grant funding coordination.

Arnold WWTF Improvements

Calaveras County Water District, California

Design Support / Estimating. HydroScience provided preliminary and final design of improvements to the Arnold Wastewater Treatment Facility (WWTF) for the Calaveras County Water District (CCWD). The Arnold WWTF is a 175,000 gpd facility that uses an oxidation ditch, secondary clarifier, pressure filter, and chlorine disinfection to treat to secondary standards. The facility currently serves 835 equivalent single-family units (ESFUs) and is covered under the General Order for Small Domestic Treatment Systems (WQ-2014-153-DWQ-R5190). The facility lacked unit process redundancy and experiences reduced clarification performance under peak wet weather flows. The existing electrical power distribution equipment was over 35 years old and did not have sufficient capacity to serve an expanded facility. HydroScience developed the design in close collaboration with CCWD engineering, operations, and maintenance staff. The project added a second secondary clarifier, improved mixed liquor flow control with provisions for a future second oxidation ditch, increased aerobic digestion capacity, replaced the return and waste activated sludge pump station, and upgraded effluent pumping. CCWD decided to expand the project scope by adding complete replacement of the utility power feed, motor control center, SCADA system, and PLC control panel, which was completed as a collaborative effort with District staff and their preferred controls engineer. The design is complete and HydroScience is assisting CCWD with securing State Revolving Fund (SRF) grant funding by preparing a technical report and overseeing completion of CEQA.

Wastewater Treatment Plant Upgrades

City of Greenfield, California

Civil/Mechanical Design. The City of Greenfield WWTP provides wastewater services to 3,800 connections. In order to meet RWQCB's recently adopted waste discharge requirements, the aging plant requires a new

Bya Founas, CEng MICE

HydroScience

wastewater treatment process. Recent studies recommended a prepackaged 2.0 MGD MBR system that would replace the existing secondary treatment process. The City retained HydroScience to perform the planning, design, obtain $60M in CWSRF external funding, and construction phase services for this groundbreaking project on the Central Coast. Design of this project will be completed during 2024 and , with constructed scheduled for 2026.

Package MBR Wastewater Treatment Plant

Chicken Ranch Rancheria of Me-Wuk Indians, Tuolumne County

Project Engineer. HydroScience was recently retained by Chicken Ranch Rancheria to design a new MBR WWTP capable of producing disinfected tertiary recycled water suitable for unrestricted reuse. Dry weather flows into the plant are expected to increase from 104,000 gpd during Phase 1 to 165,000 gpd at buildout. Components of the new WWTP will include an influent pump station a Cloacina M300-200 membrane bioreactor wastewater treatment plant, a Drypac sludge dewatering press, UV disinfection reactors, an effluent pump station, and a SCADA control system. This project was implemented by a design build team with Fluid Resource Management as the Contractor and HydroScience as the Engineer-of-Record.

St. Helena WWTRP Upgrades

City of St. Helena, California

Design Engineer. The City of St. Helena was issued a CDO containing effluent limitations the City could not reliably obtain with their existing pond treatment plant. The City commissioned HydroScience Engineers to develop a Conceptual Design Report (CDR) to analyze treatment alternatives that would comply with the new NPDES effluent discharge limitations, while also modernizing the facility's treatment process. HydroScience identified a packaged MBR treatment system as the preferred WWTRP upgrade alternative, and developed the design around this approach. The WWTRP will maintain its permitted capacity of 0.5 MGD with the flexibility to operate the plant at a peak day hydraulic capacity of 1.33 MGD. This new system will result in tens of millions of dollars in cost savings when combined with repurposing four of the existing WWTRP ponds for use as flow equalization. The design is modular so that the City can cost-effectively expand the new system to meet anticipated buildout flows, if necessary. The RWQCB accepted the CDR findings without comment.

Tule River Tertiary Wastewater System Facilities

Tule River Tribe, City of Porterville, California

Process Design Lead Engineer. HydroScience has been retained by the Tule River Tribe to design and provide permitting and funding support for a new Water Recycling Treatment Plant, recycled water storage and conveyance infrastructure, and offsite wastewater collection system improvements in the City of Porterville, California. The project objective is to offset the potable water demand associated with the Tribe's proposed Eagle Mountain Casino and Resort Relocation Project in accordance with mandated CEQA requirements. The City of Porterville currently does not treat wastewater to tertiary standards therefore; an agreement between the Tribe and City will permit the production of recycled water using the City's existing WWTP outfall. The project includes the design and construction of a new 0.308 MGD ultrafiltration plant, 0.5 MG steel storage tank, 900 gpm vertical turbine pump station, 7,000 linear feet of 12 inch PVC recycled water distribution piping, electrical and SCADA improvements, civil site improvements including a new access road, and the irrigation retrofit of the City's existing sports complex for permitted reuse of recycled water. Offsite improvements include the replacement of two existing sanitary sewer lift stations and collection system improvements. Challenges include a fast-track schedule and the need to streamline the permitting process.

Facility Master Agreement, San José-Santa Clara Regional Wastewater Facility

City of San José, California

Civil Support. HydroScience is providing on-call planning, evaluation, detailed design, and construction support services under a multi-year Master Services Agreement (MSA) with the City of San José. The Regional Wastewater Facility (RWF) is a 167 MGD secondary and tertiary wastewater treatment plant. HydroScience is working directly with the RWF's engineering, operations, and maintenance staff to implement studies and designs on an on-call basis throughout the facility. HydroScience has completed condition assessments and evaluations for the outfall bridge, major pond gates, and HVAC systems. HydroScience also completed designs of nitrification clarifier exterior lighting to improve safety during night-time operations, and designed the replacement of the existing process water (3W) pumps which deliver up to 14,000 gpm to unit processes throughout the plant.

Sutter Trunk Sewer Rehabilitation

City of Modesto, California (O'Dell Prime)

Support Project Engineer. HydroScience provided pipeline condition assessment, trenchless rehabilitation and new installation alternatives analysis/feasibility study, and design services for approximately 5,600 feet of sewer pipeline improvements associated with the City of Modesto's Sutter Trunk Sewer Project. The project included rehabilitation of existing and installation of new sewer pipeline crossing beneath Highway 99 and State Route 132. The project was broken into two phases in order to expedite construction beneath Highway 99, with significant Caltrans coordination needed to secure encroachment permit exceptions.

Marc Fernandez

Civil/Site and Pipelines

HydroScience

Marc is a project manager and project engineer with 19 years of experience. His focus is on planning, design, permitting, agency coordination, and field support for pipelines, pump stations, and related water/wastewater infrastructure. Marc has experience in pipeline/wet utilities design, plans and profiles in Civil 3D, project coordination with local, county, and state agencies and related permitting, construction oversight and owner's representation, development plan reviews, capital improvement plan development, grant funding assistance, client staff augmentation, and roadway design including grading, street improvement, drainage, and related permitting.

EDUCATION
B.S., Civil Engineering, California State University Fullerton

REGISTRATION
Engineer-in-Training, California

AFFILIATIONS
American Society of Civil Engineers (ASCE), member

SELECT PROJECT EXPERIENCE

Copper Cove WWTF Tertiary and Pond 6 Utilities Upgrades

Calaveras County Water District, California

Civil/Site and Pipelines. The Copper Cove Wastewater Treatment Facility treats mostly domestic wastewater in a series of aerated ponds and storage ponds. Secondary effluent is stored in a large effluent storage pond, Pond 6. Water from this pond is treated to Title 22 tertiary recycled water standards using a Trident Microfloc filter, disinfected in a single-channel UV disinfection process, and delivered to the Saddle Creek Golf Course for irrigation reuse with a portion discharged to wetlands. HydroScience is preparing the design to replace the aging and poorly performing existing filter unit with a continuous backwash sand filtration process, add algae removal pretreatment utilizing suspended air floatation, add solids dewatering for treating tertiary sludge, and relocate pumps and piping. CEQA documentation is also being completed under HydroScience's oversight. Expandability provisions for future buildout conditions are incorporated into the design, and the construction sequencing will implement the upgrades around ongoing facility operations. A separate design package also being prepared by HydroScience will relocate buried piping and two pump stations to make room for enlargement of the Pond 6 dam. HydroScience is also assisting with US Army Corps of Engineers (USACE) grant funding coordination.

Wastewater Treatment Plant Upgrades

City of Greenfield, California

Site Grading. The City of Greenfield WWTP provides wastewater services to 3,800 connections. In order to meet RWQCB's recently adopted waste discharge requirements, the aging plant requires a new wastewater treatment process. Recent studies recommended a prepackaged 2.0 MGD MBR system that would replace the existing secondary treatment process. The City retained HydroScience to perform the planning, design, obtain $60M in CWSRF external funding, and construction phase services for this groundbreaking project on the Central Coast. Design of this project will be completed during 2024, with constructed scheduled for 2026.

Tule River Tertiary Wastewater System Facilities

Tule River Tribe, Porterville, California

Project Engineer. HydroScience has been retained by the Tule River Tribe to design and provide permitting and funding support for a new Water Recycling Treatment Plant, recycled water storage and conveyance infrastructure, and offsite wastewater collection system improvements in the City of Porterville, California. The project objective is to offset the potable water demand associated with the Tribe's proposed Eagle Mountain Casino and Resort Relocation Project in accordance with mandated CEQA requirements. The City of Porterville currently does not treat wastewater to tertiary standards therefore; an agreement between the Tribe and City will permit the production of recycled water using the City's existing WWTP outfall. The project includes the design and construction of a new 0.308 MGD ultrafiltration plant, 0.5 MG steel storage tank, 900 gpm vertical turbine pump station, 7,000 linear feet of 12 inch PVC recycled water distribution piping, electrical

Marc Fernandez

HydroScience

and SCADA improvements, civil site improvements including a new access road, and the irrigation retrofit of the City's existing sports complex for permitted reuse of recycled water. Offsite improvements include the replacement of two existing sanitary sewer lift stations and collection system improvements. Challenges include a fast-track schedule and the need to streamline the permitting process. The project is currently in design. Marc's duties include plan and profile design, site grading design for two sewage pump stations, access roadway, and tertiary wastewater system site.

Mission Trunk Rehabilitation

Sacramento Area Sewer District, California

Project Engineer. HydroScience provided engineering services to Sacramento Area Sewer District (SASD) to rehabilitate the Mission Trunk Sewer, a 34,000 lineal foot unlined reinforced concrete pipe (RCP) ranging in diameter from 36 to 75 inches. This critical trunk sewer carries flows from Citrus Heights, Orangevale, Fair Oaks, and Carmichael to the Regional San Northeast Siphon and Interceptor. SASD performed CCTV inspections of the trunk sewer and determined that 62% of inspected pipes had medium to severe corrosion with exposed aggregate and exposed rebar. HydroScience prepared a preliminary evaluation report that reviewed and recommended rehabilitation alternatives for both pipeline and manholes, as well as sewer bypass options. Following approval of the recommendations, contract documents were prepared based on CIPP of the pipeline, polymer concrete repairs of manholes, replacement of a junction structure, new manholes, sewer bypass plans, and traffic control plans. SASD also opted to include rehabilitation of downstream facilities as part of the project, which included replacement of existing T-lock liners another junction structure, among other pertinent work. HydroScience also provided bid phase assistance and engineering services during construction.

Water and Sewer Line Improvements

City of Hayward, California

Engineering Support. HydroScience is providing engineering design, bidding, and construction support services for this important city-wide project encompassing 17,847 feet of sewer and 26,229 feet of water pipelines ranging in pipe diameter from 8- to 15-inches. Pipeline replacement projects were selected for a variety of factors, including increasing O&M capabilities (installing new manholes), replacing sewer/water mains (due to pipe deterioration and high maintenance segments), improving maintenance access, alleviating capacity constraints, and replacing pipelines that have reached the end of their useful life. HydroScience looked at some of the more challenging aspects and identified potential solutions to each, including easements, Caltrans, UPRR, and BART permitting, and pavement moratoriums. This approach anticipates potential challenges and fast tracks a process to develop solutions that will minimize surprises and keep the project on schedule. The project also includes four trenchless construction crossings. Three of the trenchless crossings utilize the bore and jack method and run underneath railroad tracks, and one also crosses a 24-inch gas transmission main. The sanitary sewer trenchless section will be constructed via guided boring and crosses under three sets of railroad tracks that are owned and operated by two different railroads. Due to poor soil conditions, the water main replacement along Main Street will utilize microtunneling to cross underneath a large storm drain box culvert.

Freedom Blvd Water and Sewer Improvements

City of Watsonville, California

Engineering Support. HydroScience provided planning, design, and ESDC for the replacement of 3,900 feet, of 8-inches to 18-inches of DIP and PVC water mains and 4,500 feet of sewer pipeline by open-cut and trenchless methods. The sewer work includes reconnection of 62 laterals, plus replacement or rehabilitation of 22 manholes. Freedom Boulevard is a congested utility corridor that required extensive utility research to minimize issues during construction. Slip-lining and CIPP methods are being employed to minimize disruption to nearby residents, businesses, and a high school.

Franklin & Hood Septic-to-Sewer Conversion

Sacramento Area Sewer District (SacSewer), California

Permitting & Traffic Control. HydroScience is working with SacSewer to implement this septic-to-sewer conversion project to the communities of Franklin and Hood which are currently served by private onsite septic tank systems. Many of these have exceeded their useful life, are not up to current codes, and may be posing a risk to the local delta environment. This project will abandon existing septic tanks and install a new low pressure sewer system in each community. A small grinder pump unit will be installed at each property being served, and these will pump the sewage out into the public force mains in the streets. The public force main for Hood will extend approximately 4.2 miles to a new discharge manhole located at the edge of the City of Elk Grove. The project includes five trenchless crossings: three HDD under streams, one HDD under highway I-5, one bore-and-jack under UPRR. A substantial hydraulic analysis exercise was conducted to evaluate different system configurations, time horizons, force main routes, and pipe sizing, while maintaining acceptable pumping heads. The permitting effort includes Caltrans, UPRR, CA Fish & Wildlife, CA State Parks, County of Sacramento, and the City of Elk Grove. HydroScience identified an alternative pipeline route that avoids longitudinal Caltrans encroachment. It is anticipated that this modification will shorten the schedule by approximately 6 months.

Thinh Le, PE

Electrical, Instrumentation & Controls

HydroScience

Thinh Le has 21 years of experience serving as Project Manager, Lead E&IC Engineer on a variety of water, wastewater, and recycled water projects. He has knowledge of ISA, IEEE, NEC, NFPA, and codes applicable to electrical and I&C system design and construction. He has worked in both electrical and I&C roles on design and construction management projects and has an extensive working knowledge of electrical project development from analysis, SCADA systems, network & communication security, industrial automation controls, emergency and standby power, and electrical power systems including low and medium voltage electrical systems.

EDUCATION

M.S., Electrical Engineering, California State University, Sacramento

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

REGISTRATION

Electrical Engineer, California, Registration No. E18362

SELECT PROJECT EXPERIENCE

Copper Cove WWTF Tertiary and Pond 6 Utilities Upgrades

Calaveras County Water District, California

Electrical Engineer. The Copper Cove Wastewater Treatment Facility treats mostly domestic wastewater in a series of aerated ponds and storage ponds. Secondary effluent is stored in a large effluent storage pond, Pond 6. Water from this pond is treated to Title 22 tertiary recycled water standards using a Trident Microfloc filter, disinfected in a single-channel UV disinfection process, and delivered to the Saddle Creek Golf Course for irrigation reuse with a portion discharged to wetlands. HydroScience is preparing the design to replace the aging and poorly performing existing filter unit with a continuous backwash sand filtration process, add algae removal pretreatment utilizing suspended air floatation, add solids dewatering for treating tertiary sludge, and relocate pumps and piping. CEQA documentation is also being completed under HydroScience's oversight. Expandability provisions for future buildout conditions are incorporated into the design, and the construction sequencing will implement the upgrades around ongoing facility operations. A separate design package also being prepared by HydroScience will relocate buried piping and two pump stations to make room for enlargement of the Pond 6 dam. HydroScience is also assisting with US Army Corps of Engineers (USACE) grant funding coordination.

Arnold WWTF Improvements

Calaveras County Water District, California

Electrical and I&C Lead. HydroScience provided preliminary and final design of improvements to the Arnold Wastewater Treatment Facility (WWTF) for the Calaveras County Water District (CCWD). The Arnold WWTF is a 175,000 gpd facility that uses an oxidation ditch, secondary clarifier, pressure filter, and chlorine disinfection to treat to secondary standards. The facility currently serves 835 equivalent single-family units (ESFUs) and is covered under the General Order for Small Domestic Treatment Systems (WQ-2014-153-DWQ-R5190). The facility lacked unit process redundancy and experiences reduced clarification performance under peak wet weather flows. The existing electrical power distribution equipment was over 35 years old and did not have sufficient capacity to serve an expanded facility. HydroScience developed the design in close collaboration with CCWD engineering, operations, and maintenance staff. The project added a second secondary clarifier, improved mixed liquor flow control with provisions for a future second oxidation ditch, increased aerobic digestion capacity, replaced the return and waste activated sludge pump station, and upgraded effluent pumping. CCWD decided to expand the project scope by adding complete replacement of the utility power feed, motor control center, SCADA system, and PLC control panel, which was completed as a collaborative effort with District staff and their preferred controls engineer. The design is complete and HydroScience is assisting CCWD with securing State Revolving Fund (SRF) grant funding by preparing a technical report and overseeing completion of CEQA.

Memorial Park Wastewater Treatment Facilities Improvements

County of San Mateo, California

Lead I&C. Memorial County Park is a family and group campground facility. Wastewater generated within the park is collected

Thinh Le, PE

HydroScience

in two separate collection systems, with a total length of approximately 1.8 miles of 4- to 8-inch gravity sewer. Most of the wastewater flowed to a 30,000 gallon per day (gpd) extended aeration WWTP. Wastewater is treated to secondary standards, disinfected, and discharged to a dedicated spray field with an unlined retention lagoon to handle larger flows. The remainder of the wastewater flows to a septic tank and leach field system. The collection system and WWTP were over 50 years old. Due to age, poor performance, reliability concerns, and high maintenance requirements, the County retained HydroScience to plan, design, and oversee construction for a new, modern 50,000 gpd sequencing batch reactor WWTP. The design also included new yard piping and modifications to the existing WWTP, to repurpose it as a new sewer lift station. Site drainage improvements included in the design help to mitigate ponding issues. HydroScience developed a collaborative, forward-looking project approach that provides reliable operation and permit compliance in a small, low-impact footprint, and that reduces the cost and staff time to operate and maintain.

St. Helena WWTRP Upgrades

City of St. Helena, California

Electrical Engineer. The City of St. Helena was issued a CDO containing effluent limitations the City could not reliably obtain with their existing pond treatment plant. The City commissioned HydroScience Engineers to develop a Conceptual Design Report (CDR) to analyze treatment alternatives that would comply with the new NPDES effluent discharge limitations, while also modernizing the facility's treatment process. HydroScience identified a packaged MBR treatment system as the preferred WWTRP upgrade alternative, and developed the design around this approach. The WWTRP will maintain its permitted capacity of 0.5 MGD with the flexibility to operate the plant at a peak day hydraulic capacity of 1.33 MGD. This new system will result in tens of millions of dollars in cost savings when combined with repurposing four of the existing WWTRP ponds for use as flow equalization. The design is modular so that the City can cost-effectively expand the new system to meet anticipated build-out flows, if necessary. The RWQCB accepted the CDR findings without comment. Construction is nearly completed.

Wastewater Treatment and Effluent Management Facilities

Lytton Rancheria, Sonoma County, California

Lead EI&C. As part of a design/build team, HydroScience completed design and is in the process of completing construction of wastewater and recycled water facilities serving a new tribal residential development in Sonoma County. The Lytton Rancheria project consists of construction of new homes, a community center, and a retreat center. HydroScience designed a complete Membrane Bioreactor (MBR) Wastewater Treatment Facility utilizing shop-fabricated treatment units to treat 250,000 gpd of peak dry weather flow. The design includes an administration building, UV disinfection, solids dewatering system, effluent storage pond, and recycled water pump station. The design was developed through a collaborative progressive design build process.

Wastewater Treatment Plant Upgrades

City of Greenfield, California

Lead EI&C. The City of Greenfield WWTP provides wastewater services to 3,800 connections. In order to meet RWQCB's recently adopted waste discharge requirements, the aging plant requires a new wastewater treatment process. Recent studies recommended a prepackaged 2.0 MGD MBR system that would replace the existing secondary treatment process. The City retained HydroScience to perform the planning, design, obtain $60M in CWSRF external funding, and construction phase services for this groundbreaking project on the Central Coast. Design of this project will be completed during 2024, with constructed scheduled for 2026.

Package MBR Wastewater Treatment Plant

Chicken Ranch Rancheria of Me-Wuk Indians, Tuolumne County

Lead EI&C. HydroScience was recently retained by Chicken Ranch Rancheria to design a new MBR WWTP capable of producing disinfected tertiary recycled water suitable for unrestricted reuse. Dry weather flows into the plant are expected to increase from 104,000 gpd during Phase 1 to 165,000 gpd at buildout. Components of the new WWTP will include an influent pump station a Cloacina M300-200 membrane bioreactor wastewater treatment plant, a Drypac sludge dewatering press, UV disinfection reactors, an effluent pump station, and a SCADA control system. This project was implemented by a design build team with Fluid Resource Management as the Contractor and HydroScience as the Engineer-of-Record.

Regional Wastewater Control Facilities

Stockton, San Joaquin County, California

Lead EI&C. HydroScience played a lead role on the rehabilitation of the primary clarifiers and sludge and scum pumping systems as part of this Progressive Design-Build project. The existing clarifiers consisted of three discrete banks constructed at different times (as far back as the 1940s) and configured differently. Two of the clarifiers were "squircular" (circular mechanisms in square tanks) while the remaining ones are rectangular. HydroScience performed a mechanical condition assessment, utilized a facility mass balance to determine anticipated future sludge removal rates and flows for pumping, developed proposed rehabilitation approaches for the clarifiers, worked with the contractor to refine construction approach and develop cost estimates for the improvements, and presented our findings in a workshop to City staff.

PCSG

JOHN COLLINS, MBA

EDUCATION

B.S., Construction Management, Northern Arizona University, 1998

Masters Degree, Business Administration, University of Phoenix, 2006

REGISTRATIONS

Licensed Contractor–
NV A-85243, B-2/B-5-85244
AZ – KA-333539

CERTIFICATIONS

Occupational Safety and Health Administration – 30 Hour, Competent Person – Excavation, Confined Spaced Entry

Occupational Safety and Health Administration – Confined Space Entry Trainer

YEARS OF EXPERIENCE

Years with PCSG - 7
Total Years - 26

PROFESSIONAL AFFILIATIONS

Nevada Associated General Contractors, Member since 2002
Public Works Committee President, 2009 and 2011, Education Committee VP, 2020

American Society of Civil Engineers, Member since 2018

EXPERIENCE PROFILE

John is a true professional builder with an incredible history of bidding and building successful projects. Delivering projects on time and budget is a direct result of the detailed planning and analysis process. With experience from laborer and carpenter all the way to Operations Manager with one of the Nation's largest general contractors, John has the technical know-how, hands-on experience, and communication skills to successfully plan, cost, and coordinate even the most complex estimates, projects, and schedules. With over 25 years of experience across multiple markets and regions, he has developed the ability to communicate with Owners and Engineers as well as talk with craftsman and subcontractors to find constructability solutions and best value options that deliver the most accurate and current probable cost data.

REPRESENTATIVE PROJECT EXPERIENCE

COPPER COVE POND 6 REHBILITATION PROJECT – Calaveras County Water District, San Andreas, CA ($9.5M)
PCSG provided Budgetary Independent Cost Estimating for a storage reservoir improvement that included clearing, structural fill, intake and outlet structures, overflow channels, and grading

- Prepared cost estimates using HCSS Heavy-Bid
- Analyzed plans and scope of work for production, labor and equipment usage, means and methods, and assessment of risk and the cost of risk mitigation.

ARNOLD WWTP IMPROVEMENT PROJECT – Calaveras County Water District, San Andreas, CA ($6.5M)
PCSG provided budgetary project estimating and scheduling for the rehabilitation

- Prepared cost estimates using HCSS Heavy-Bid
- Analyzed plans and scope of work for production, labor and equipment usage, means and methods, and assessment of risk and the cost of risk mitigation.

ADVANCED WATER PURIFICATION FACILITY – Truckee Meadows Water Authority, Washoe County, NV ($160M)
PCSG is providing Independent Cost Estimating and constructability consulting for a retrofit of an existing wastewater facility including headworks, process capacity expansion, and effluent reservoir storage.

- Developed cost estimate using HCSS Heavy-Bid, analyzed CMAR estimates prepared in Timberline and Excel
- Member of the Project Risk Committee and developing the risk register
- Assembled and provided bid comparisons in excel. Provided analysis of quantity, manhours, unit cost, equipment cost, and labor cost
- Created wage tables for all craft labor rates to ensure compliance with State Prevailing Wage as well as Davis-Bacon wage requirements.
- Utilized the project plans and specifications to assemble detailed cost estimates. Participated in design review and constructability workshops through multiple phases and design stages.
- Provided VE analysis of design options for various structures

STMWRF CMAR - Washoe County, Washoe County, NV ($100M)
PCSG is providing Independent Cost Estimating and constructability consulting for a retrofit of an existing wastewater facility including headworks, process capacity expansion, and effluent reservoir storage.

- Developed cost estimate using HCSS Heavy-Bid, analyzed CMAR estimates prepared in Timberline and Hard Dollar
- Developed risk matrix and analyzed CMAR risk register
- Assembled and provided bid comparisons in excel. Provided analysis of quantity, manhours, unit cost, equipment cost, and labor cost

PCSG

JOHN COLLINS, MBA

- Created wage tables for all craft labor rates to ensure compliance with State Prevailing Wage as well as Davis-Bacon wage requirements.
- Utilized the project plans and specifications to assemble detailed cost estimates. Participated in design review and constructability workshops through multiple phases and design stages.
- Provided VE analysis of design options for various structures

RENO-STEAD WRF – City of Reno, Stead, NV ($55M)

PCSG provided Independent Cost Estimating and cost control consulting for a retrofit of an existing wastewater facility including headworks, aeration basins, clarifiers, and process capacity expansion.

- Prepared cost estimates using HCSS Heavy-Bid
- Analyzed contractor estimates for production, labor and equipment usage, means and methods, and assessment of risk and the cost of risk mitigation
- Provided cost comparison excel spreadsheet for review of quantities, unit cost, and approach
- Reviewed RFI's, plans, specifications, and construction documents to evaluate cost impacts
- Evaluated craft labor rates to ensure compliance with project requirements for state and federal wages

DCLTSA WWTP CMAR – DCLTSA, Stateline, NV (8M)

PCSG provided Independent Cost Estimating and constructability consulting for a retrofit of an existing wastewater facility including aeration basin rehabilitation, replacing primary treatment systems, and discharge pump station retrofit and surge suppression.

- Prepared cost estimate using HCSS Heavy-Bid and analyzed CMAR estimate in Hard Dollar format
- Provided cost comparison excel spreadsheet for review of quantities, unit cost, and approach
- Assembled and provided bid comparisons in excel. Provided analysis of quantity, manhours, unit cost, equipment cost, and labor cost
- Created wage tables for all craft labor rates to ensure compliance with Nevada State Prevailing Wage as well as Davis-Bacon wage requirements.
- Utilized the project plans and specifications to assemble detailed cost estimates. Participated in design review and constructability workshops through multiple phases and design stages.

Quill Water Treatment Plant – Carson City, Carson City, NV ($12M)

PCSG is providing Independent Cost Estimating and schedule review services for the Quill Water Treatment Plant upgrade project including building modifications, sitework, new treatment basins, UV disinfection and packaged water treatment installation.

- Prepared cost estimates using HCSS Heavy-Bid
- Analyzed scope of work for production, labor and equipment usage, means and methods, and assessment of risk and the cost of risk mitigation
- Evaluated craft labor rates to ensure compliance with project requirements for state and federal wages

Brad Friederichs, SE Structural Engineer

VE Solutions

VE SOLUTIONS, INC.

Brad Friederichs has 38 years of experience as a structural engineer for wastewater, water treatment, commercial, industrial, agricultural, retail and residential structures. His expertise is in cast-in-place concrete, prestressed concrete, steel, wood and masonry construction. His specialty is in producing completely detailed, contractor friendly, value-oriented construction documents resulting in projects that bid well with few change orders.

EDUCATION

B.S., Civil Engineering with honors, California State University, Sacramento

REGISTRATION

Structural Engineer, California, Registration No. S2780

AFFILIATIONS

Structural Engineers Association of Central California, president 1989-90

American Society of Civil Engineers

American Concrete Institute

American Institute of Steel Construction

PROJECTS AS SUBCONSULTANT TO HYDROSCIENCE

Copper Cove WWTF Tertiary and Pond 6 Utilities Upgrades

Calaveras County Water District, California

Structural Engineer. The Copper Cove Wastewater Treatment Facility treats mostly domestic wastewater in a series of aerated ponds and storage ponds. Secondary effluent is stored in a large effluent storage pond, Pond 6. Water from this pond is treated to Title 22 tertiary recycled water standards using a Trident Microfloc filter, disinfected in a single-channel UV disinfection process, and delivered to the Saddle Creek Golf Course for irrigation reuse with a portion discharged to wetlands. HydroScience is preparing the design to replace the aging and poorly performing existing filter unit with a continuous backwash sand filtration process, add algae removal pretreatment utilizing suspended air floatation, add solids dewatering for treating tertiary sludge, and relocate pumps and piping. CEQA documentation is also being completed under HydroScience's oversight. Expandability provisions for future buildout conditions are incorporated into the design, and the construction sequencing will implement the upgrades around ongoing facility operations. A separate design package also being prepared by HydroScience will relocate buried piping and two pump stations to make room for enlargement of the Pond 6 dam. HydroScience is also assisting with US Army Corps of Engineers (USACE) grant funding coordination.

Arnold WWTF Improvements

Calaveras County Water District, California

Structural Engineer. HydroScience provided preliminary and final design of improvements to the Arnold Wastewater Treatment Facility (WWTF) for the Calaveras County Water District (CCWD). The Arnold WWTF is a 175,000 gpd facility that uses an oxidation ditch, secondary clarifier, pressure filter, and chlorine disinfection to treat to secondary standards. The facility currently serves 835 equivalent single-family units (ESFUs) and is covered under the General Order for Small Domestic Treatment Systems (WQ-2014-153-DWQ-R5190). The facility lacked unit process redundancy and experiences reduced clarification performance under peak wet weather flows. The existing electrical power distribution equipment was over 35 years old and did not have sufficient capacity to serve an expanded facility. HydroScience developed the design in close collaboration with CCWD engineering, operations, and maintenance staff. The project added a second secondary clarifier, improved mixed liquor flow control with provisions for a future second oxidation ditch, increased aerobic digestion capacity, replaced the return and waste activated sludge pump station, and upgraded effluent pumping. CCWD decided to expand the project scope by adding complete replacement of the utility power feed, motor control center, SCADA system, and PLC control panel, which was completed as a collaborative effort with District staff and their preferred controls engineer. The design is complete and HydroScience is assisting CCWD with securing State Revolving Fund (SRF) grant funding by preparing a technical report and overseeing completion of CEQA.

Memorial Park Wastewater Treatment Facilities Improvements

County of San Mateo, California

Structural Engineer. Memorial County Park is a family and group campground facility. Wastewater generated within the park is collected in two separate collection systems, with a total length of approximately 1.8 miles of 4- to 8-inch gravity sewer. Most of the wastewater flowed to a 30,000 gallon per day (gpd) extended aeration WWTP. Wastewater is treated to secondary standards, disinfected, and discharged to a dedicated spray field with an unlined retention lagoon to handle larger flows. The remainder of

Brad Friederichs, SE

VE Solutions

the wastewater flows to a septic tank and leach field system. The collection system and WWTP were over 50 years old. Due to age, poor performance, reliability concerns, and high maintenance requirements, the County retained HydroScience to plan, design, and oversee construction for a new, modern 50,000 gpd sequencing batch reactor WWTP. The design also included new yard piping and modifications to the existing WWTP, to repurpose it as a new sewer lift station. Site drainage improvements included in the design help to mitigate ponding issues. HydroScience developed a collaborative, forward-looking project approach that provides reliable operation and permit compliance in a small, low-impact footprint, and that reduces the cost and staff time to operate and maintain.

Wastewater Treatment Plant Reliability Improvements Project

Silicon Valley Clean Water, Redwood City, California

Structural Engineer. HydroScience is the engineer-of-record for the Overaa/HydroScience design-build team for this design-build project to provide plant reliability improvements for Silicon Valley Clean Water's 24 MGD WWTP in Redwood Shores, California. Work includes upgrading the aeration basin blower system to high speed turbo blowers with all new distribution piping and control valves, correcting basin flow split issues starting with a hydraulic profile study, installing a fan press solids dewatering system and conveyors, adding backup water for generators, and replacing their granular media filter backwash pumps.

St. Helena WWTRP Upgrades

City of St. Helena, California

Structural Engineer. The City of St. Helena was issued a CDO containing effluent limitations the City could not reliably obtain with their existing pond treatment plant. The City commissioned HydroScience Engineers to develop a Conceptual Design Report (CDR) to analyze treatment alternatives that would comply with the new NPDES effluent discharge limitations, while also modernizing the facility's treatment process. HydroScience identified a packaged MBR treatment system as the preferred WWTRP upgrade alternative, and developed the design around this approach. The WWTRP will maintain its permitted capacity of 0.5 MGD with the flexibility to operate the plant at a peak day hydraulic capacity of 1.33 MGD. This new system will result in tens of millions of dollars in cost savings when combined with repurposing four of the existing WWTRP ponds for use as flow equalization. The design is modular so that the City can cost-effectively expand the new system to meet anticipated buildout flows, if necessary. The RWQCB accepted the CDR findings without comment. Construction is nearly completed.

Buena Vue Casino Water and Wastewater Facilities

Buena Vue Rancheria, Amador County, California

Structural Engineer. HydroScience provided detailed design for wells, potable water supply, and wastewater treatment systems for this casino project. Wastewater treatment utilizes a 100,000 gpd membrane bioreactor (MBR) providing tertiary-treated Title-22 compliant effluent for discharge and onsite irrigation use in accordance with an NPDES permit. The wastewater treatment system includes influent pumps, fine screens, nitrification/denitrification, equalization, emergency storage, hollow fiber membrane modules, ultraviolet disinfection, and solids screw press. Water supply components include three wells, sodium hypochlorite injection, greensand filtration for iron and manganese removal, 1.25 MG storage tank, booster pumps for fire and domestic demands, and backwash/solids handling systems. The project was constructed via the design-build delivery method.

Regional Wastewater Control Facilities

City of Stockton, California

Structural Engineer. HydroScience played a lead role on the rehabilitation of the primary clarifiers and sludge and scum pumping systems as part of this Progressive Design-Build project. The existing clarifiers consisted of three discrete banks constructed at different times (as far back as the 1940s) and configured differently. Two of the clarifiers were "squircular" (circular mechanisms in square tanks) while the remaining ones are rectangular. HydroScience performed a mechanical condition assessment, utilized a facility mass balance to determine anticipated future sludge removal rates and flows for pumping, developed proposed rehabilitation approaches for the clarifiers, worked with the contractor to refine construction approach and develop cost estimates for the improvements, and presented our findings in a workshop to City staff. HydroScience helped develop the process control narratives and finalized the construction plans and specifications and is currently providing review of construction submittals. Once construction is complete, the clarifiers will have a total capacity of 80 MGD.

WWTP Gravity Thickener Rehabilitation

City of San Mateo, California

Structural Engineer. HydroScience performed a condition assessment on the existing gravity thickener system at the City of San Mateo's 12 MGD WWTP. HydroScience coordinated the confined space entry into the drained tank to examine the exposed thickener mechanism, and prepared recommendations to rehabilitate the entire gravity thickener system. The design includes replacement of the thickener mechanism; replacing the existing sludge withdrawal line; modifications to the existing pump room layout; modifications to change the configuration of the tanks from square to circular; piping and splitter box modifications; recoating the effluent well; miscellaneous repairs to concrete and grating; and electrical improvements.

O'DELL ENGINEERING a Westwood company

STAFF QUALIFICATIONS

Scott Roberts, PLS

Surveyor

CAREER EXPERIENCE
13 Years in the Land Surveying Industry

FIRM EXPERIENCE
8 Years at O'Dell Engineering, a Westwood company

EDUCATION
BS, Geomatics Engineering, California State University, Fresno

PROFESSIONAL REGISTRATIONS
Registered Land Surveyor No. 9235, CA

FAA Remote Pilot

SUMMARY – Mr. Roberts has professional surveying experience in both the public and private sectors with work on an array of design projects such as large-scale municipal efforts, private master planned communities, agricultural properties, and commercial developments. He is skilled in AutoCAD Civil 3D, Trimble GNSS & Robotic TS, Trimble Business Center, Trimble RealWorks, and Terrestrial LiDAR. His responsibilities have included project management, topographic surveying and mapping, boundary surveying and mapping, underground utility locating, construction staking, elevation certificates, laser scanning, legal descriptions, and GIS.

RELEVANT EXPERIENCE:

CALAVERAS CO. WATER DISTRICT COPPER COVER WASTEWATER LIFT STATIONS: COPPEROPOLIS, CA
O'Dell provided topographic mapping and boundary surveying to support the design of sanitary sewer lift station and force main improvements. Services included survey control, topographic surveying and mapping, and a record right-of-way survey. Mr. Roberts served as Lead Land Surveyor.

ACWD ALAMEDA AND DECOTO RESERVOIRS: ALAMEDA COUNTY, CA
Mr. Roberts served as Project Manager and supported Alameda County Water District for this project. O'Dell provided topographic surveying to support the renovations of the Alameda Reservoir and the Decoto Reservoir.

BASS LAKE WASTEWATER TREATMENT PLANT AND EFFLUENT DISPOSAL SYSTEM: MADERA COUNTY, CA
Mr. Roberts served as Project Surveyor and provided survey support services for this wastewater treatment plant and effluent disposal system improvement project at Bass Lake in Madera County. The goal of the project was to replace the deteriorating infrastructure at this County treatment and disposal facility to improve process operability, reduce annual operating and maintenance costs, accommodate peak flows, and maintain permit compliance. The work included topographic surveying and mapping to support the design of the improvements.

MEMORIAL PARK WASTEWATER TREATMENT AND INFRASTRUCTURE REPLACEMENT PROJECT: SAN MATEO COUNTY, CA
O'Dell Engineering provided land surveying services for this wastewater treatment and infrastructure replacement project. Mr. Roberts served as Project Surveyor. Services included topographic surveying and mapping. O'Dell performed a topographic survey and mapping of the sanitary sewer system and wastewater treatment plant.

ORCHARD RUN WATER TREATMENT PLANT IMPROVEMENT PROJECT: SCOTTS VALLEY, CA
Mr. Roberts served as Project Surveyor and provided survey support services for the Orchard Run Water Treatment Plant Improvement Project in Scotts Valley, CA. O'Dell Engineering provided surveying services including topographic and boundary surveys, mapping of underground utilities, and other survey work to support the design of utility and site improvements at the plant.

With Blackburn Since 2005

Office Location
Auburn, CA

Education
- M.S. Geological Engineering, University of Nevada, Reno, 2002
- B.S. Geology, California State University Sacramento, 2000

Registrations
- Professional Geologist, California #7997
- Certified Engineering Geologist, California, #2508

Affiliations
- AEG - Association of Engineering Geologists

Geotechnical
Geo-Environmental
Forensics
Construction Services

Robert C. Pickard, PG, CEG

Senior Engineering Geologist

BLACKBURN CONSULTING

Mr. Pickard graduated from the University of Nevada, Reno, with a Geological Engineering degree and has more than 22 years of experience in geotechnical/geologic engineering. He has worked on a wide variety of projects, including pipelines, dams, tanks, highways, and bridges throughout California. His experience includes subsurface investigation, soil, rock, groundwater analysis, excavatability, and slope stability studies.

Representative Experience

Lincoln Wastewater Treatment and Reclamation Facility Expansion, Placer County, CA
Rob was the Senior Engineering Geologist for this planned expansion of the Lincoln Wastewater Treatment and Reclamation Facility. The project includes the construction of a new oxidation ditch, clarifier, filters, and associated structures at the existing plant. The project also includes an effluent storage basin that will cover 45 acres and a new pump station constructed within an existing embankment. Rob performed analysis and prepared Geotechnical Design Reports for the treatment plant expansion, the storage basin, and the pump station.

Davis Water Treatment Plants, Well 32, Davis, CA
Rab completed a geotechnical evaluation and report for two new water treatment facilities, including backwash tanks, filters, generators, and related pumps and piping. The proposed tanks will be steel construction, 24 ft in diameter, and have a ring footing with an interior pad of compacted base rock. Filters will consist of two tanks, each approximately 8’ in diameter and 24’ long.

Folsom South Area Group Transmission Pipeline and Pump Station Project, Folsom, CA
Senior Engineering Geologist for designing about 19,000 linear feet of new 30-inch ductile iron water transmission pipeline to the existing water treatment plant west of Willow Creek Drive. A pump station with an approximately 15-foot-deep wet well will also be constructed at the treatment plant as part of the project. Rob assisted in managing subsurface explorations, reviewed existing geologic mapping and documentation, and analyzed and completed a Geotechnical Report.

NID Banner Cascade Pipeline, Nevada County, CA
Project Engineering Geologist for the Banner-Cascade project, which increases raw water delivery capacity and reliability for agricultural customers and local water treatment plants. The project consists of over 5.5 miles of 48-and 36-inch diameter raw water pipe, parallel 8- and 12-inch diameter treated water pipeline, new outlet control facility and flow control facility, and encasement of a portion of the Upper Grass Valley Canal.

Mid-Western Placer Regional Sewer Project, Placer County, CA
Project Engineering Geologist for this regional sewer project included decommissioning one wastewater treatment plant, expansion of another plant, and over 15 miles of new pipeline. The pipeline included two trenchless crossings of environmentally sensitive waterways. Assisted in preparing a Geotechnical Design Report and performed site investigation, including borings, test pits, geologic mapping, and seismic refraction surveys.

PCWA Ophir Gardens Pipeline Extension, Auburn, CA
Project Engineering Geologist for the Ophir Gardens Pipeline Extension (a PCWA pipeline) located near the City of Auburn. The new pipeline will be approximately 1,600 feet in length and tie-in to an existing pipeline near the City of Auburn Wastewater Treatment Plant and provide water to several homes near the intersection of Ophir Road and Wise Road. Blackburn completed a subsurface investigation that consisted of borings and laboratory testing. We prepared a Geotechnical Memorandum that summarized geotechnical/geologic conditions for design and construction of the new pipeline.

Hydroscience Engineers is a civil engineering firm that plans, designs, and manages the construction of water, wastewater, and recycled water projects. With offices in Sacramento, Berkeley, and San Jose, we understand and address the complex water and wastewater needs of Northern California.

HydroScience

PROPOSED FEE

Task	Description	Curtis Lam PIC and QA/QC	Bill Slenter Project Manager	Jory Benitez Process Engineering	Marc Fernandez Civil/Site and Pipelines	Bya Founas Mecanical Engineering	Thinh Le Electrical/EIC Lead	Electrical EIC Support	Drafting	Hours	Fee	PCSG Cost Estimating	VE Solutions Structural	Blackburn Geotechnical	O'Dell Surveying	OCDs	Expense Subtotal with Markup	Total Fee
	Labor Classification	Prin	Prin	E-II	E-III	E-III	E-IX	E-III	CAD									
	Hourly Rate	$305	$305	$204	$215	$215	$292	$215	$160									
A	**Project Management/QAQC**	**18**	**40**	**18**	**0**	**5**	**5**	**0**	**0**	**86**	**$23,897**	**$0**		**$0**	**$0**	**$0**	**$0**	**$23,897**
	General Project Management/Tracking	2	20	8						**30**	**$8,342**						**$0**	**$8,342**
	Bi-Weekly Status Calls		20	10		5	5			**40**	**$10,675**						**$0**	**$10,675**
	QA/QC	16								**16**	**$4,880**						**$0**	**$4,880**
B	**Project Design Report**	**0**	**44**	**71**	**105**	**23**	**62**	**103**	**49**	**457**	**$103,513**	**$2,000**		**$0**	**$0**	**$600**	**$4,830**	**$108,343**
	Kickoff meeting/Comprehensive Site Visit		8	8			8			**24**	**$6,408**					$300	**$315**	**$6,723**
	Data request, review, and collection		1	2	14		20	32		**69**	**$16,443**						**$0**	**$16,443**
	Evaluation and Alternatives		10	20	30					**60**	**$13,580**						**$0**	**$13,580**
	PDR Cost Estimating		1	2	1	1	1	2		**8**	**$1,865**	$2,000					**$2,100**	**$3,965**
	Workshop 1		4	3		2	1	3		**13**	**$3,199**					$150	**$158**	**$3,357**
	Prepare Preliminary Drawings		2	8	24		12	32	45	**123**	**$24,986**						**$0**	**$24,986**
	Prepare Draft PDR		10	16	24	20	10	26		**106**	**$24,284**						**$0**	**$24,284**
	Workshop 2		4	4			4			**12**	**$3,204**					$150	**$158**	**$3,362**
	Prepare Final PDR		4	8	12		6	8	4	**42**	**$9,544**						**$0**	**$9,544**
	Structural Engineering - Predesign Phase									**0**	**$0**		$2,000				**$2,100**	**$2,100**
C	**Topographic Surveying**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**$0**	**$0**		**$0**	**$29,600**	**$0**	**$31,080**	**$31,080**
	Prepare Topographic Survey									**0**	**$0**				$29,600		**$31,080**	**$31,080**
D	**Geotechnical Investigation**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**$0**	**$0**		**$54,293**	**$0**	**$0**	**$57,008**	**$57,008**
	Field Investigation and Geotechnical Report									**0**	**$0**			$54,293			**$57,008**	**$57,008**
E	**Permit and Environmental Assistance**	**0**	**6**	**0**	**12**	**0**	**0**	**0**	**0**	**18**	**$4,410**	**$0**		**$0**	**$0**	**$0**	**$0**	**$4,410**
	Develop Project Description and Data Tables		6		12					**18**	**$4,410**						**$0**	**$4,410**
F	**Project Design**	**0**	**119**	**339**	**173**	**397**	**70**	**333**	**266**	**1697**	**$362,596**	**$12,760**		**$0**	**$0**	**$200**	**$61,384**	**$423,980**
	Prepare 50% Plans and Draft Technical Specifications		40	140	80	160	12	100	110	**642**	**$134,964**						**$0**	**$134,964**
	Design Review Meeting		4	3		2	1	3		**13**	**$3,199**						**$0**	**$3,199**
	Prepare 90% Plans and Specifications		40	100	60	130	30	160	90	**610**	**$131,010**						**$0**	**$131,010**
	Design Review Meeting		4	3		2	1	3		**13**	**$3,199**						**$0**	**$3,199**
	Prepare 100% Plans and Specifications		24	80	24	100	20	60	40	**348**	**$75,440**						**$0**	**$75,440**
	Design Phase Cost Estimating		1	3	1	1	3	1	2	**12**	**$2,758**	$12,760					**$13,398**	**$16,156**
	Design Review Meeting		2	2		2	1	2		**9**	**$2,170**						**$0**	**$2,170**
	Prepare Bid-Ready Plans and Specifications		4	8	8		2	4	24	**50**	**$9,856**					$200	**$210**	**$10,066**
	Structural Engineering - Design Phase									**0**	**$0**		$45,501				**$47,776**	**$47,776**
G	**Construction Assistance**	**0**	**36**	**67**	**48**	**72**	**36**	**124**	**24**	**407**	**$91,460**	**$0**		**$0**	**$0**	**$800**	**$9,271**	**$100,731**
	Site Visits (4)		8	8			4	8		**28**	**$6,960**					$600	**$630**	**$7,590**
	Construction Meetings (8)		6	4		4	2	4		**20**	**$4,950**						**$0**	**$4,950**
	RFI Responses (35)/General Support		16	16	30	4	10	50		**126**	**$29,124**						**$0**	**$29,124**
	Submittal Responses (75)		4	35	16	60	16	60		**191**	**$42,272**						**$0**	**$42,272**
	Change Order Assistance		2	2		4	4	2		**14**	**$3,476**						**$0**	**$3,476**
	Record Drawings			2	2				24	**28**	**$4,678**					$200	**$210**	**$4,888**
	Structural Engineering Support									**0**	**$0**		$8,030				**$8,431**	**$8,431**
OVERALL BASE SERVICES		**18**	**245**	**495**	**338**	**497**	**173**	**560**	**339**	**2665**	**$585,876**	**$14,760**	**$55,530**	**$54,293**	**$29,600**	**$1,600**	**$163,572**	**$749,448**
OPTIONAL SERVICES																		
	Separate secondary clarifier, RAS/WAS PS		8	24	16	40	4	8	28	**128**	**$26,744**		$39,130	$7,830			**$49,308**	**$76,052**
	Wet Well UESP Pump Station		2		12				4	**18**	**$3,830**		$6,000	$3,510			**$9,986**	**$13,816**
	Record of Survey									**0**	**$0**				$17,800		**$18,690**	**$18,690**
	PCSG constructability review		1	2		2	1	2		**8**	**$1,865**	$4,060					**$4,263**	**$6,128**

HYDROSCIENCE ENGINEERS, INC.

Standard Schedule of Estimated Billing Rates

Effective January 1, 2024 through December 31, 2024

Labor Classification	2024 Hourly Rate
Principal	$305
Engineer IX	$292
Engineer VIII	$280
Engineer VII	$265
Engineer VI	$253
Engineer V	$242
Engineer IV	$231
Engineer III	$215
Engineer II	$204
Engineer I	$187
Engineering Aide	$110
Construction Professional VI	$200
Construction Professional V	$190
Construction Professional IV	$180
Construction Professional III	$170
Construction Professional II	$150
Construction Professional I	$140
Cross Connection Control Specialist	$135
CAD Manager	$160
CAD Designer	$140
Marketing Professional	$120
Administrative II	$110
Administrative	$95

Hourly billing rates include postage and telephone charges that are normal to the work authorized. Other direct costs for travel, reproduction, mail service, outside services, etc. will be invoiced at 110 percent of the actual cost. Rates for expert witness services shall be billed at the quoted rates plus $50/hour.

PCSG

April 11, 2024

Bill Slenter, PE
HydroScience Engineers
10569 Old Placerville Rd.
Sacramento, CA 95827-2504

Dear Bill,

Please see the following rate sheet for consulting services:

Activity	2024 Hourly Rate
Cost Estimating, Scheduling, On Call Project Consulting	$145
Construction Management (Depending on Availability)	$135
Travel (from Reno, NV)	$90 per hour
Air Travel/Lodging	Cost plus 10%
Daily Travel Perdiem	$85 per day
Alternate Delivery Pre-Construction Services – Project Specific	TBD

Should additional services or direct cost activities be requested, those services can be provided at the estimating billable rate. Any expenses incurred to be billed at cost plus 10%.

Cost estimate will include an open book copy of the estimate to include manhour, crew, and equipment analysis. Cost estimate will be in HCSS Heavy-Bid format and a PDF copy of the estimate will be provided.

Hourly rates are for the 2024 calendar year. Increases of approximately $5 per hour are expected for each calendar year, beginning January 1st of 2024 and escalating each year on January 1st.

Please contact me with any questions or comments. I can be reached at 775-309-3116.

Sincerely,

John Collins
Pre-Construction Services Group

Where Value and Engineering Come Together
VE SOLUTIONS, INC.

2023-2025 RATE SCHEDULE

Structural Engineer	$185 per hour
Drafter	$120 per hour

650 University Avenue, Suite 110 • Sacramento, CA 9 5 825 (916) 505.0519 • Fax (916) 514.9102 •
bradf@vesolutions.net

O'Dell Engineering
FEE SCHEDULE
August 2023

Classification:	Regular Hourly Rate:
Principal	$295
Senior Civil Engineer	$230
Senior Engineer 2	$210
Senior Engineer 1	$194
Engineer 2	$190
Engineer 1	$180
Assistant Engineer 2	$155
Assistant Engineer 1	$140
Senior Landscape Architect 2	$210
Senior Landscape Architect 1	$190
Landscape Architect 2	$180
Landscape Architect 1	$170
Landscape Designer 3	$165
Landscape Designer 2	$155
Landscape Designer 1	$145
Planner	$185
Assistant Planner	$150
Dry Utility Project Manager 2	$180
Dry Utility Project Manager 1	$160
Utility Engineer	$145
CADD Operator 2	$125
CADD Operator 1	$100
Surveyor Manager	$215
Senior Land Surveyor	$205
Senior Surveyor 2	$200
Senior Surveyor 1	$180
Surveyor 2	$160
Surveyor 1	$150
Assistant Surveyor 2	$140
Assistant Surveyor 1	$125
Survey Crew 2-man/1-man	$330/$190
Survey Crew 2-man/1-man (Prevailing Wage)	$416/$240
Administrative 3	$150
Administrative 2	$130
Administrative 1	$110
Outside Services & Reproduction: Cost of services and expenses charged to O'Dell Engineering by outside consultants, commercial printers, and professional or technical firms engaged in connection with the project.	Actual cost plus 10%
Travel: Mileage, per diem, and subsistence are not normally charged to the client unless specific prior authorization is negotiated between client and consultant.	Actual cost plus 10%

Auburn Main Office:
11521 Blocker Drive, Suite 110
Auburn, CA 95603
(530) 887-1494, Fax (530) 887-1495

West Sacramento Office:
2491 Boatman Avenue
West Sacramento, CA 95691
(916) 375-8706, Fax (916) 375-8709

Fresno Office:
4186 W. Swift Avenue, Suite 107
Fresno, CA 93722
(559) 438-8411, Alt. (559) 276-4246

BLACKBURN CONSULTING
www.blackburnconsulting.com

2024 SCHEDULE OF FEES & SERVICES

Geotechnical ▪ Geo-Environmental ▪ Construction Services ▪ Forensics ▪ Laboratory

PROFESSIONAL HOURLY RATES:

Project Engineer / Geologist I	$195	CAD/GIS	$190
Project Engineer / Geologist II	$210	Lab Aide	$130
Senior Engineer / Geologist	$230	Lab Manager	$195
Project Manager	$255	Field Services Manager	$220
Construction Manager	$260	Clerical	$115
Senior Project Manager	$285	Project Assistant	$145
Principal / Senior Consultant	$330	Administrative	$175
Senior Principal	$375	Senior Administrative	$195

SPECIAL INSPECTION PERSONNEL HOURLY RATES:

	Non-Prevailing Wage	Prevailing Wage
Group 1 *ASNT Level II-III, DSA Shotcrete, Lead Inspector, NICET Level IV*	$170	$225
Group 2 *AWS-CWI, ICC Certified Structural Inspector, NICET Level III, Building/Construction Inspector, Shear Wall/Floor System Inspector*	$170	$220
Group 3 *Soils/Asphalt, Earthwork Grading, Excavation and Backfill, NICET Level II*	$150	$205

MINIMUM BASIC CHARGES:

Outside Equipment & Services	Cost plus 20%
Vehicle Charge	$8.00 per hour or $1.00 per mile
Per Diem	Location specific, minimum $185 per night
Technician Services	Charge includes time from office and return to office, minimum charge - 4 hours
Overtime	Over 8 hours: 1.5 x Hourly Rate Before 7:00am or after 4:00pm: 1.5 x Hourly Rate Rush Charge (less than 24 hours notice): 1.5 x Hourly Rate Saturday: 1.5 x Hourly Rate (minimum: 4 hr. increments) Sunday & Holiday: 2.0 x Hourly Rate (minimum: 4 hr increments)

EQUIPMENT: *(personnel not included)*

Hand Sampling Equipment	$348 / Day	Double Ring Infiltrometer Equipment	$386 / Day
Nuclear Moisture/Density Testing	$23 / Test	Level Survey Equipment	$330 / Day
6" Sand Cone Testing	$60 / Test	Pachometer	$168 / Day
12" Sand Cone Testing	$242 / Test	Rock Point Load Test Equipment	$168 / Day
Coring Bit Charge	$60 / Core	Roto Hammer	$163 / Day
Coring Machine	$336 / Day	Schmidt Hammer	$138 / Day
Dynamic Cone Penetrometer	$348 / Day	Torque Wrench	$94 / Day
Electrical Resistivity Equipment	$318 / Day	Seismic Refraction: 12 / 24 Channel	$597 / Day
Generator	$94 / Day	MASW Survey Equipment	$597 / Day
Groundwater Level Indicator	$88 / Day	Traffic Control/Safety	$386 / Day
Inclinometer Survey Equipment	$809 / Day	Concrete Vapor Emission Test Kit	$50 / Ea
pH Test Strip Package	$74 / Ea	Pull Testing Equipment	$212 / Day
PID (MiniRAE)	$100 / Day or $300 / Week		

12/7/2023

Agenda Item

DATE: July 2, 2024

TO: Engineering Committee, Calaveras County Water District
Michael Minkler, General Manager

FROM: Kevin Williams, Senior Civil Engineer

RE: AMI Project Additional Purchases – PRV Pressure Control Equipment

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SUMMARY

The AMI Meter Project built a District-wide two-way Sentryx-based network for reading meters. This same network can be utilized in many more ways. Mueller acquired i20 water whose pressure monitoring and control solutions can be integrated within our existing Sentryx network. It offers the ability to monitor and control Pressure Reducing Valves (PRV's) in the field through the network.

The PRV Monitoring and Controls Systems offer more accurate, stable and smooth control over pressure networks. We will be able to detect problems before they happen. The downstream pressures can be fixed and the PRV controls will adjust automatically using intelligent algorithms. These controls not only control the pressures but can dramatically reduce water losses.

District staff spoke with the USDA about funding the purchase of this equipment through the existing meter project as we have $1 million in grant funding available to be spent. The USDA provided verbal agreement that this would be eligible as part of the grant expenditure.

The staff is looking for direction from the Engineering Committee on proceeding with this process of engaging USDA for the purchase of this equipment. We would rely on District distribution staff to install the equipment. District labor for installation would not be reimbursable by USDA. We would maximize the use of the available grant fund. Before finalizing the purchase order, staff would take this to the full Board for approval.

Attachments:
1) Mueller Product Information Sheet

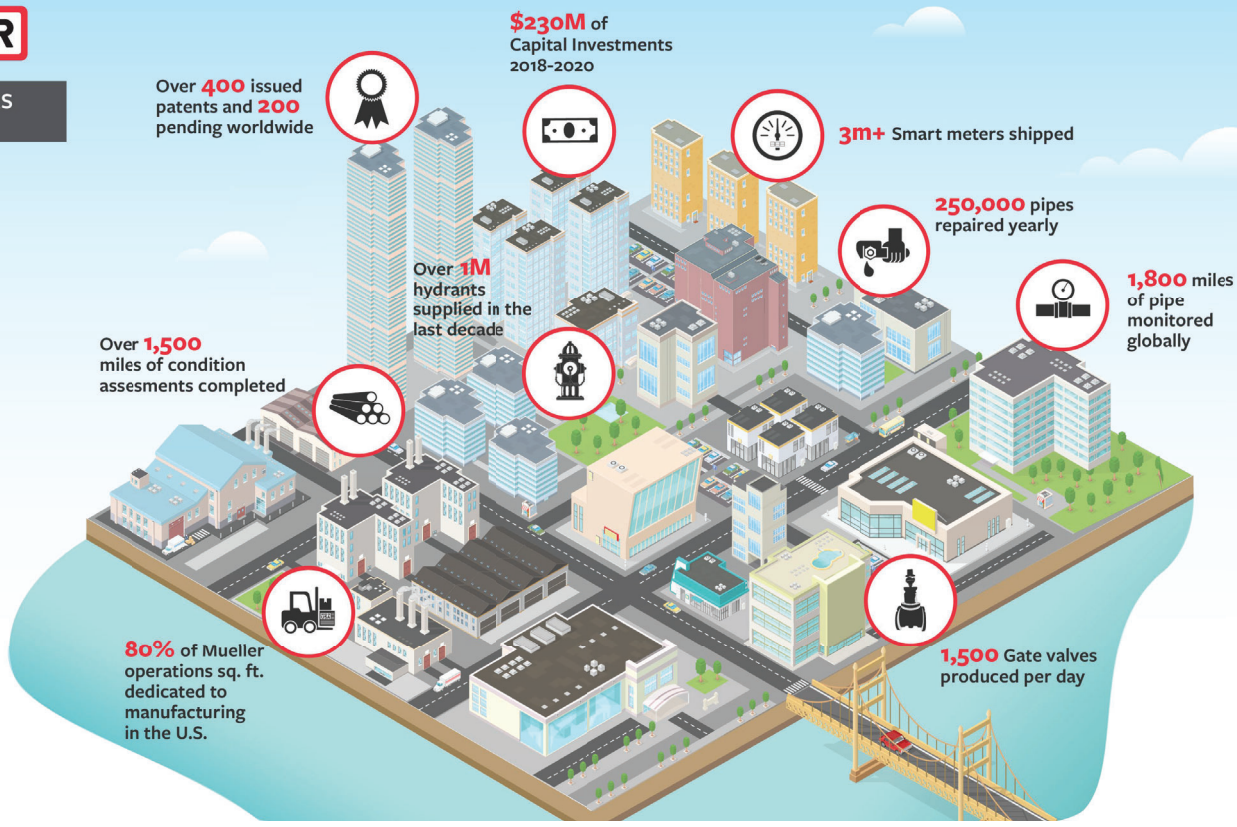
MUELLER

Network Pressure Monitoring

Mike Uthe; M. Eng
Water Management Solutions – Western Manager
406-223-2192
muthe@muellerwp.com

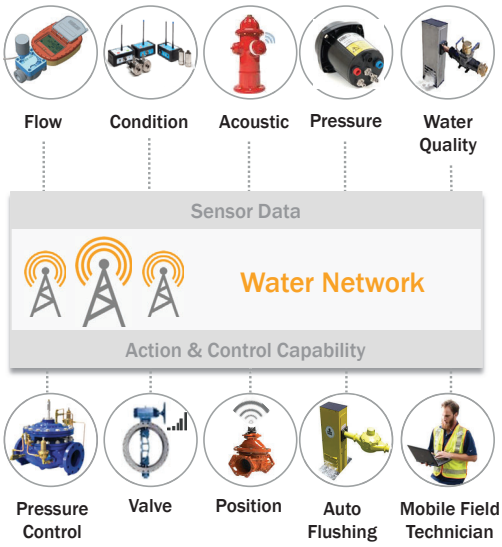
MUELLER

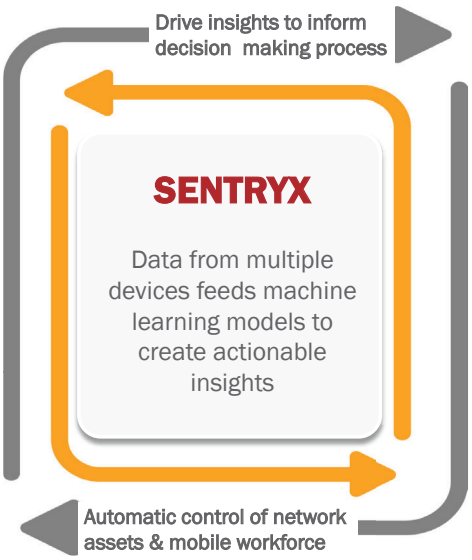
Over 160 YEARS OF EXCELLENCE



The Mueller Vision for Sentryx – Intelligent Software Platform

Current Mueller Product Portfolio





Water Network Administrators

Utilize Sentryx insights & visualization tools to:

Asset Managers

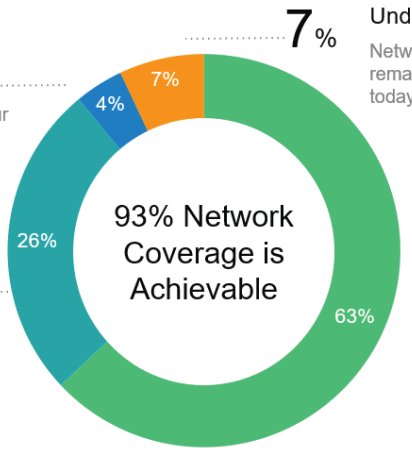
- Extend Asset Life
- Optimize and Prioritize Expenditures

Field Supervisors

- Produce Digital Workflows
- Plan Maintenance & Inspections

MUELLER

Mueller Monitoring Options



7% Undetectable
Network anomalies that remain undetectable with todays technology roadmap.

4% Flow Monitoring
Network anomalies that occur within households or commercial businesses. Frozen pipes, service leaks, burst water tanks etc.

26% Pressure Monitoring
Network anomalies that are detectable by pressure / transient monitoring. Bursts that are rapid caused by surges or catastrophic failures.

63% Acoustic Monitoring
Anomalies detectable by acoustic technology. Leaks that are slow growing: joint or corrosion based.

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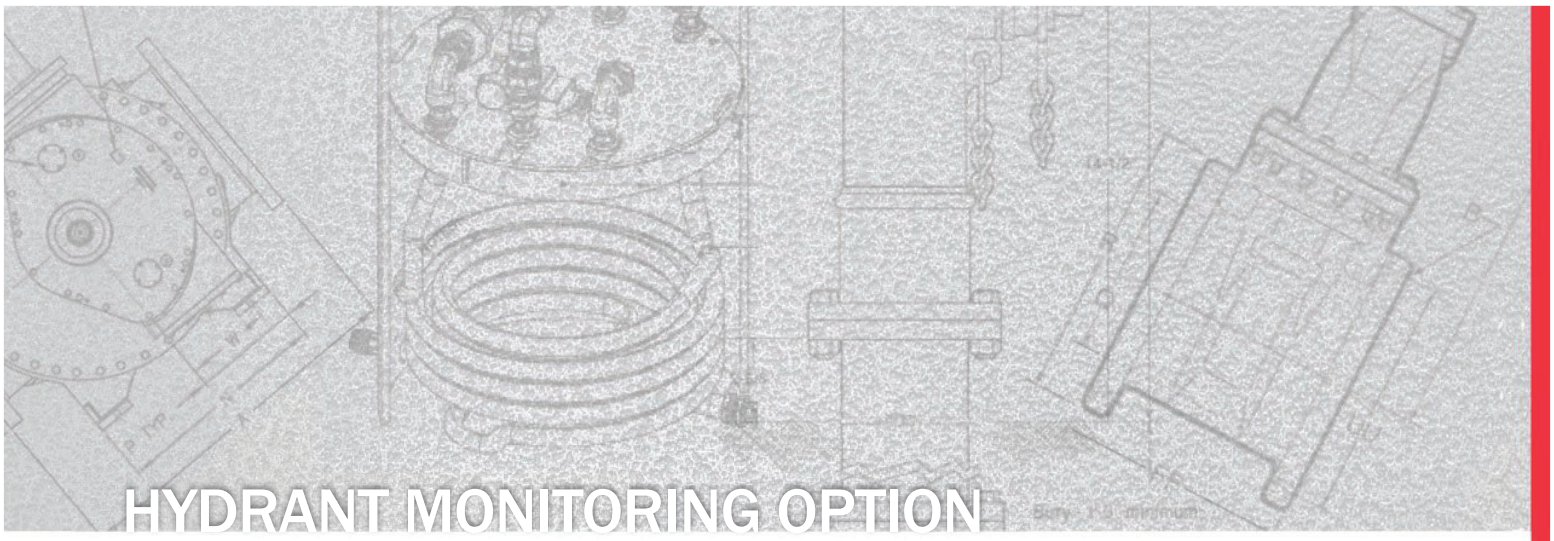
How do we achieve desired outcomes?

Utility Value	Acoustic Monitoring	Pressure Monitoring	Flow Monitoring	Pressure Control
Find slow growing leaks	✓	✗	✗	✗
Find bursts	✗	✓	✗	✗
Find Household leaks	✗	✗	✓	✗
Decrease break rate	✗	✗	✗	✓
Improve Speed / Quality of Repair*	✓	✓	✓	✗
Decrease Real Losses	✓	✓	✗	✓
Decrease Unavoidable Losses	✗	✗	✗	✓
Extend asset life	✗	✗	✗	✓



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Pressure Monitoring

Why monitor pressures throughout the distribution network?

- To prevent damage and interruption in service
- To reduce customer complaints
- To optimize pressure data
- To identify high pressure areas
- To reduce energy costs and improve pump operation efficiency
- To confirm auto flushers have operated properly and stay in compliance with Federal and State regulations for pressure and chlorine residuals

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Why Use a Hydrant to Monitor the Water Distribution System?

- It's already installed and easily accessible.
  - 7 to 10 million hydrants installed in the US
- It belongs to the water utility.
  - No additional footprint or infrastructure is required.
- It can be easily modified to monitor key parameters.
  - Leaks
  - Pressure

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SENTRYX Software Enabled SUPER CENTURION Hydrant

Super Centurion®

The most sold hydrant in North America, trusted and proven, now has become the communication hub and physical architecture, housing advanced sensors.

Leak Monitoring

Leak monitoring provides visibility to the presence and location of emerging leaks at key locations in a water network.

Pressure Monitoring

Pressure monitoring system sensors are protected, enshrouded within the lower stem, and through porting is able to capture pressure data (while the main valve is closed) from the water in the hydrant shoe and network.

Cellular Communications to Sentryx Software

Gathered sensor data, along with insights are displayed on the Sentryx Water Intelligence Platform.

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Overview – Super Centurion and Sentryx

- Sentryx software enabled Super Centurion Hydrant is configured based on customer specification with EchoShore-DX technology and/or Pressure Monitoring
- Pressure Sensor provides network pressure monitoring with the Main Valve CLOSED, avoiding the Charged hydrant
- Innovative wireless design and engineered components make hydrant installation, operation, repair and maintenance easy
- Available as a new fire hydrant or as a retrofittable kit
- Retrofit kit supports Mueller 5-1/4” or 4-1/2” Centurion fire hydrants with bury depths 3’-0” thru 10’-0”, manufactured since 1975.

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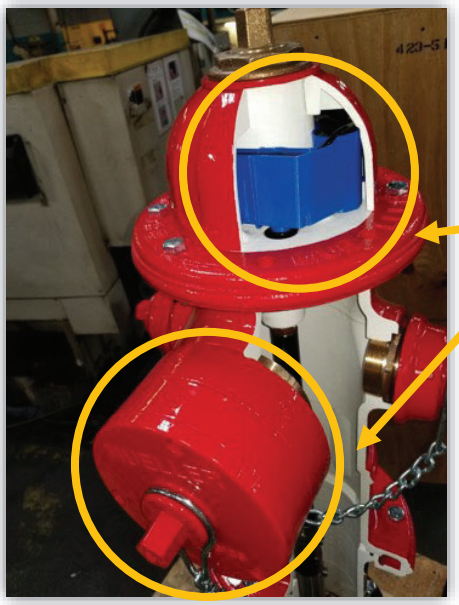
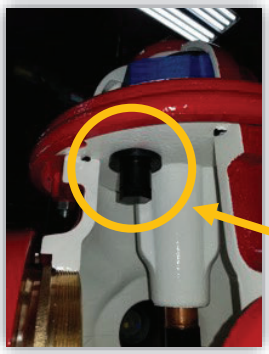
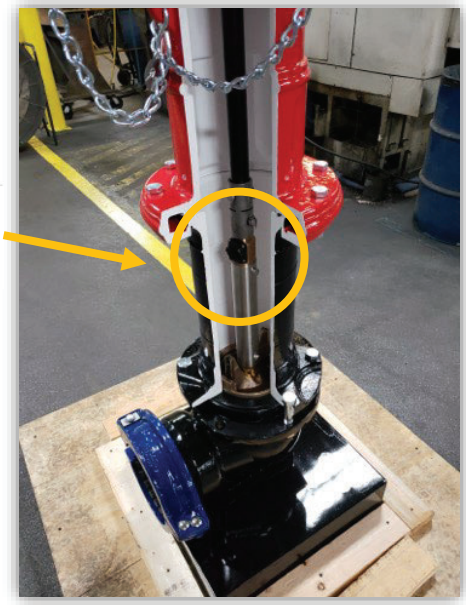
Sentryx Software Enabled Super Centurion Hydrant



Cellular



Bluetooth



Familiar Centurion:
(Few Unique Parts)

- Bonnet Assembly
- Lower Stem Assembly
- Valve Nut
- Pumper Cap

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Sentryx Software Enabled Super Centurion Hydrant

EchoShore-DX Cap

Painted to match

Operating nut matches customer need

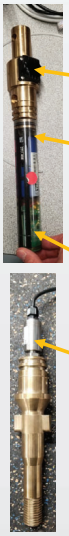
Integrated processor and battery

Antenna

Advanced acoustic sensor

Thread matches customer need

Smart Stem



Bluetooth Antenna

Batteries

Processor

Pressure sensor

Smart Bonnet

Batteries

Processor & Antenna

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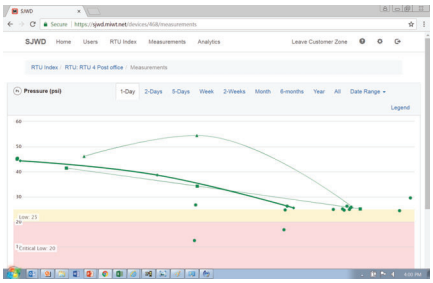
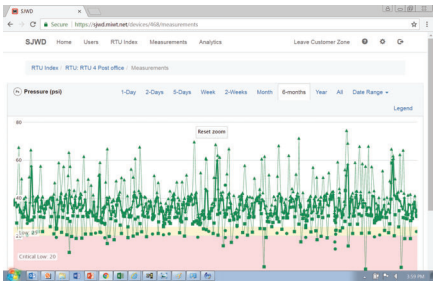
Pressure Monitoring...**How?** When? Where? **What?** Why?

How frequently can Mueller's hydrant monitoring system sample pressure?

- Multiple reading options in a "steady state" mode
- In a "transient state" mode the device will sample at rate of 4, 32, or 256 readings per second.
- Observance Mode...Know when pressure differentials are beyond your set points
- Sampling Mode...Raw data for hydraulic modeling



Steady State



Transient State

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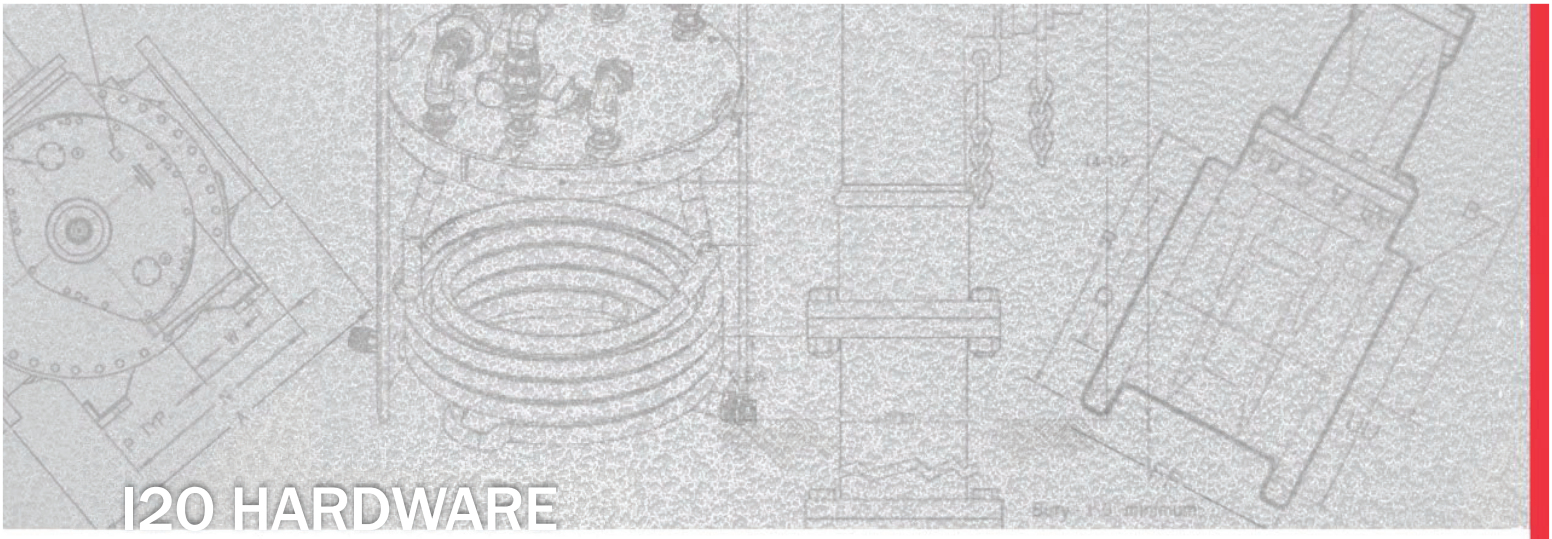

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In June 2021, Mueller acquired i20 Water whose pressure monitoring and control solutions are used by more than 150 water companies in more than 50 countries around the world

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There are 3 products in the i20 portfolio

Pressure & Flow Loggers

- Monitor flow and pressure throughout your network using cellular data backhaul
- Deliver timely and valuable data you can rely on for decision making

PRV Controllers

- Pressure Reducing Valve (PRV) controller used with logger and pilot valve (APV) to regulate the pressure in water networks
- Highly secure, data can easily be integrated with other systems

Sentryx Intelligent Network

- Monitoring and analytics software platform
- Vision includes Sentryx Water Intelligence Platform integration (future state)

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i20 Logger Variants

Single Pressure

Bi-directional flow

Triple Pressure

Bi-directional flow

i20 loggers

- Highly robust flow and pressure remote logger with proven performance longevity.
- Over 20,000 units deployed worldwide.
- Available in 1P2F or 3P2F configurations. 0 -145 psi or 0 - 435 psi options with accuracy of ± 0.1% of FS.
- Local configuration available for initial start-up – followed by “over the air” upgrades using LTE-M cellular network (antenna options).
- 1Hz scanning capability for transient detection; configurable logging interval and communication schedule.
- Unmatched smart alarms using a decaying alarm principle.
- Under normal use, 5-year battery – user replaceable.

Features of i20 logger

Communication	4G, NB-IOT or LTE-M
Logger deployment	Laptop software
	Android smartphone/tablet app
	Instantaneous readings
	GPS location
Data transmission	Up to 5 minute intervals
Power	Internal battery
	External battery
	External power supply

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Features of i20 logger

Integration	Secure transfer of data at high frequencies using API
Alarms	Email or SMS
	Hardware (HH and LL detected by device)
	Platform (H and L generated upon receipt)
Third party integration	Ingest data from all third party flow and pressure sources
Additional parameters	Battery voltage, signal strength, mobile network and water temperature
Pressure transients	Max and min transient activity each recording period inc. standard deviation

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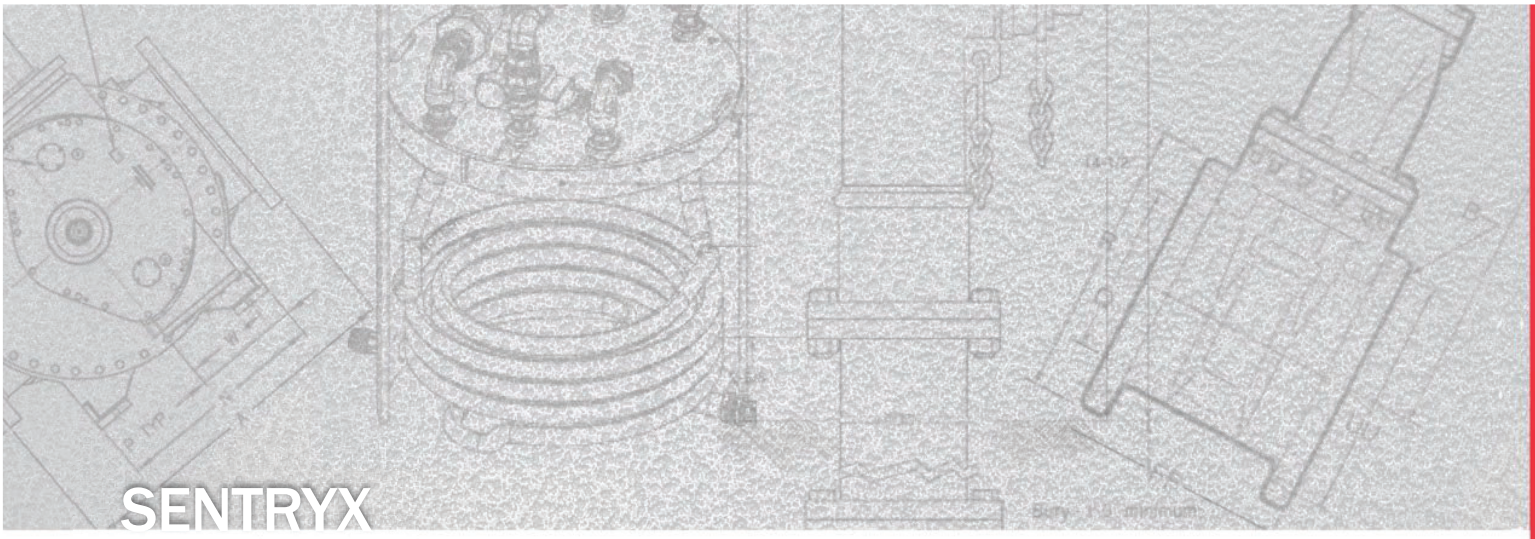

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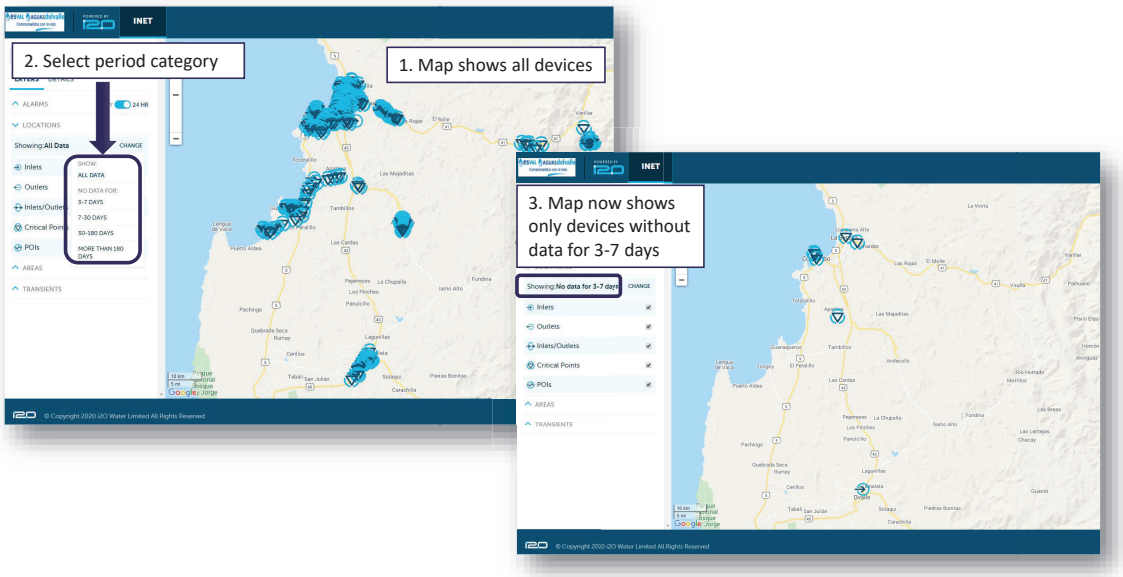
Data Availability

iNet displays loggers (inc. 3rd party devices) that have not transmitted data within default periods



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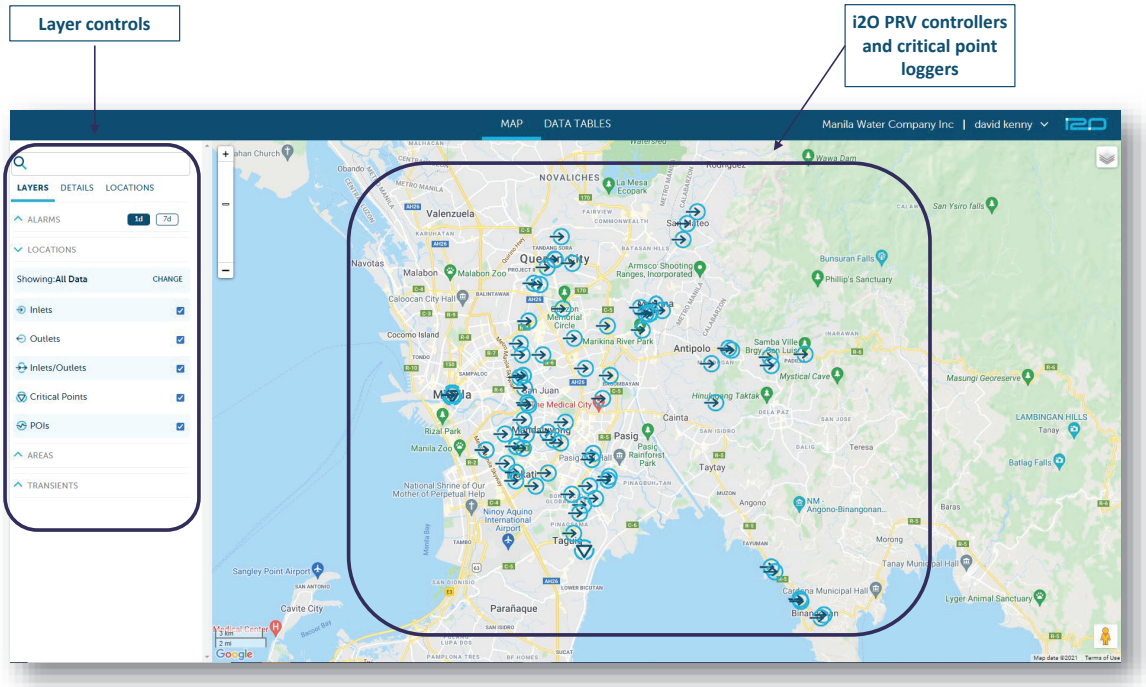
Map Interface



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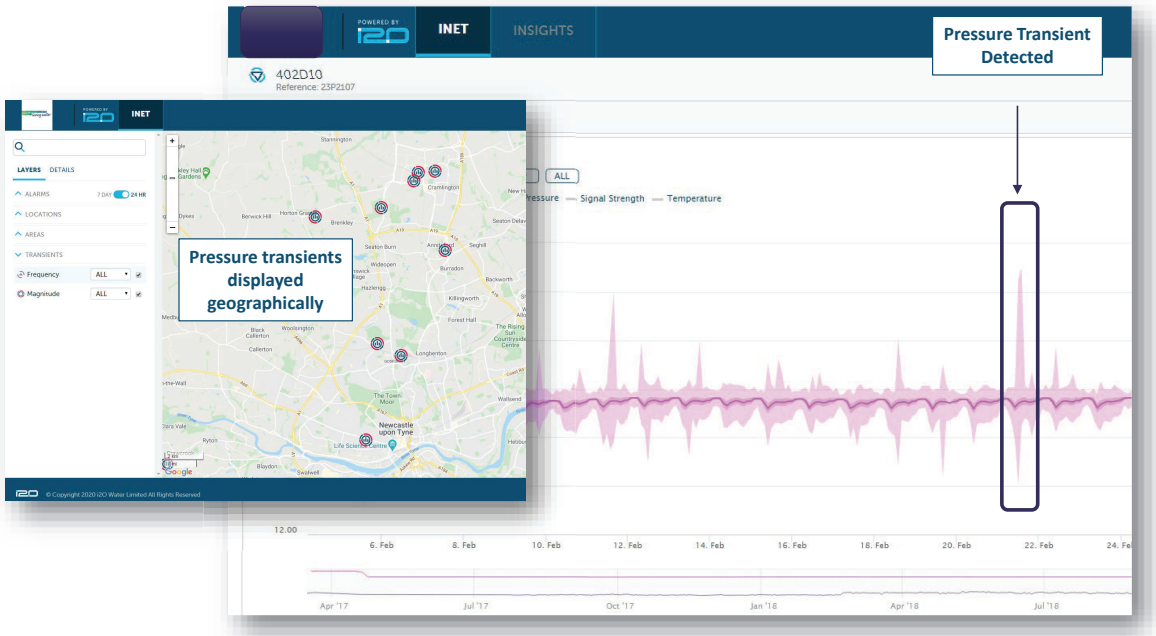
Graph Interface



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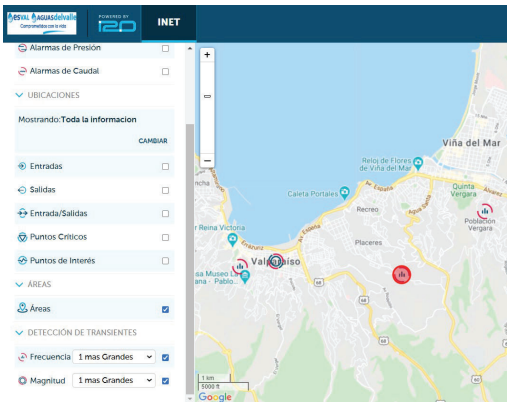
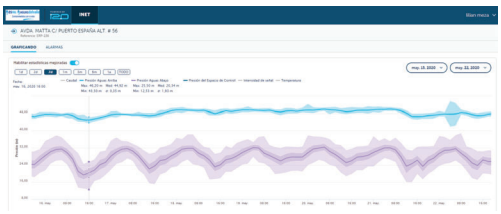
The transient detection algorithm identifies transients using data from i2O devices

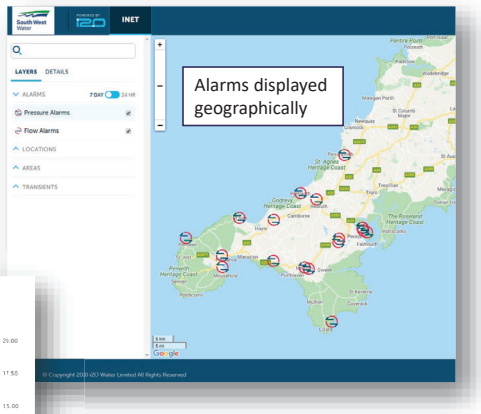
- Detect transients with i2O devices using the Enhanced Statistics mode
- i2O detects 100% of transients identified by expensive high resolution 128Hz loggers
- Transients identified are ranked by frequency and magnitude on the map
- Graphing shows the exact nature of the transient activity aiding diagnosis of the cause

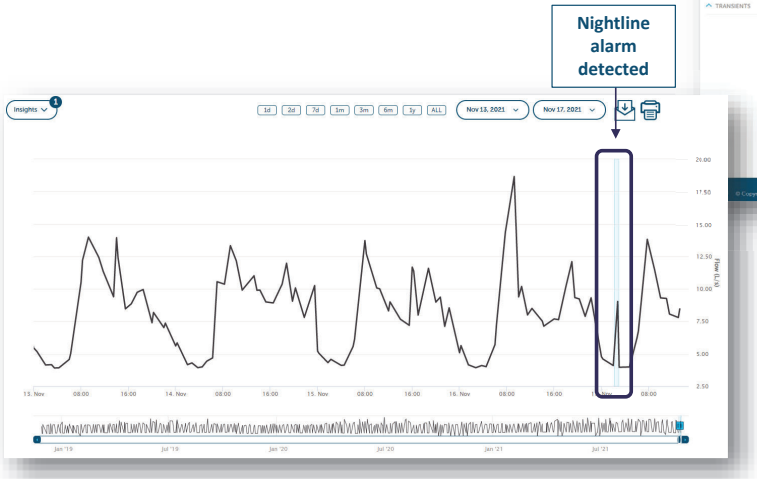




Smart Alarms

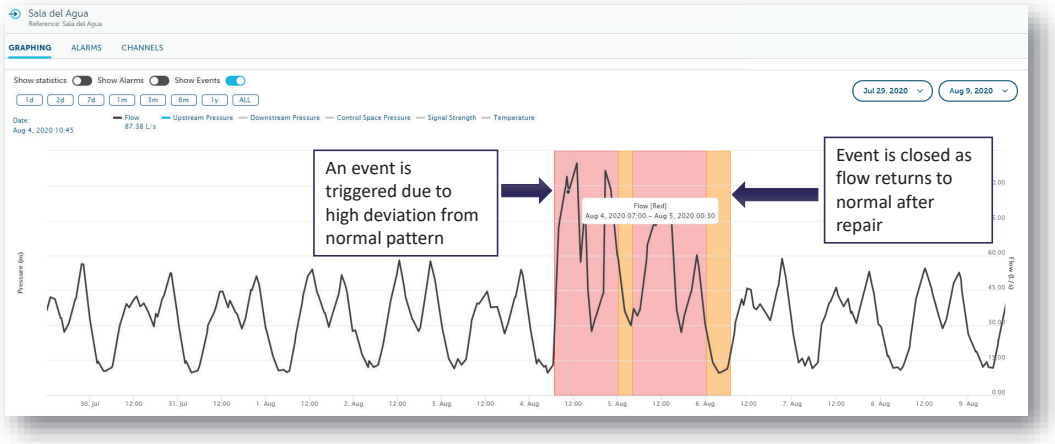
- iNet's smart alarm algorithm automatically generates high and low alarm thresholds for flow and pressure to avoid manual review and updating
- It works on 3rd party devices





iNet Event Detection

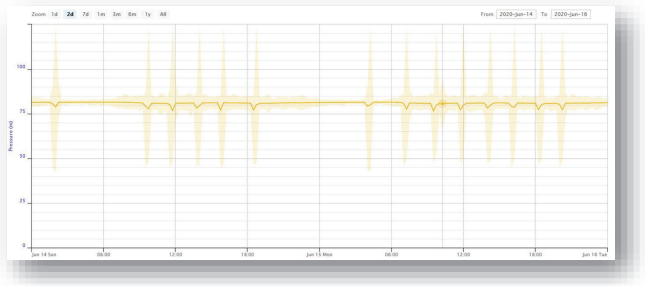
- Automatically detect events before they occur
- Works on any flow and pressure signals (i2O and other sources)



i20 loggers also collect uniquely valuable information

For Transient Detection at 1Hz:

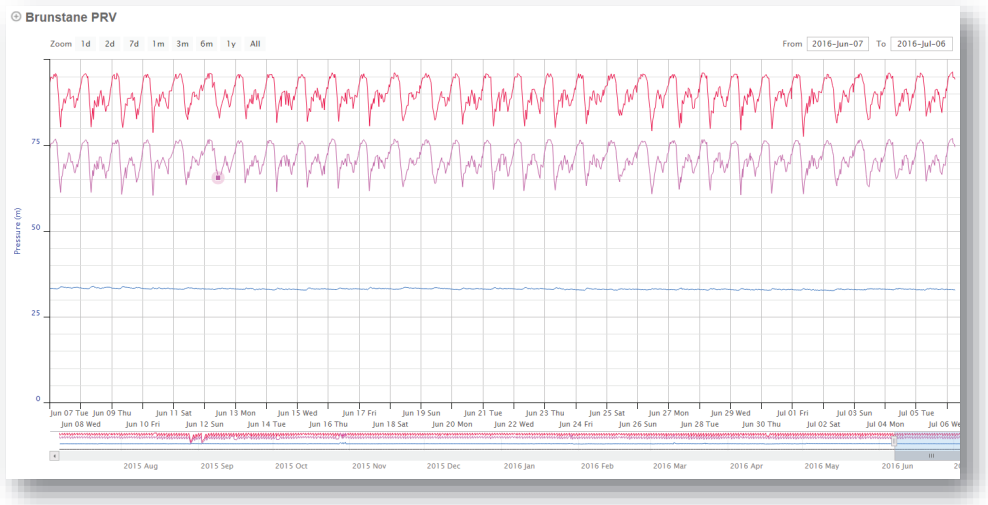
- Mean
- Max
- Min
- Standard deviation



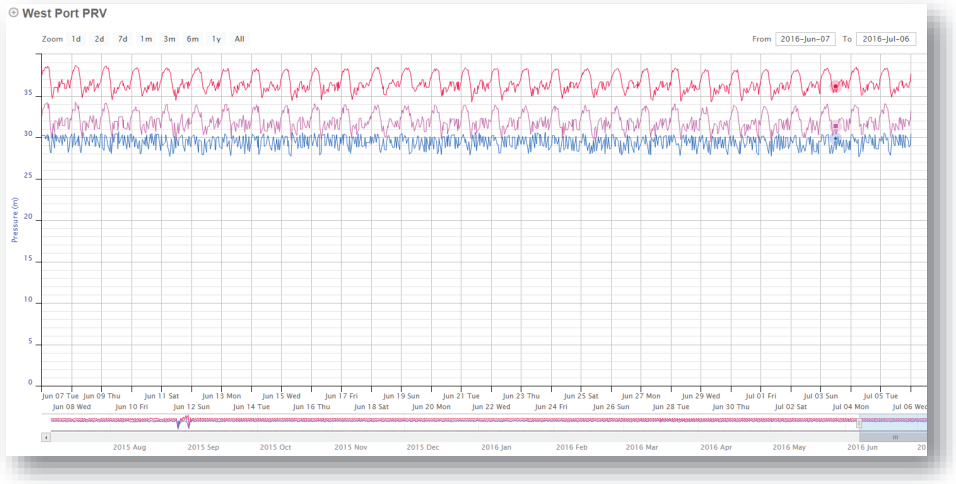
For PRV Monitoring:

- Inlet & Outlet Pressures
- Control Chamber Pressure for Performance Evaluation

PRV Condition – PRV working well



PRV Condition – unstable PRV outlet pressure



The downstream pressure is unstable due to insufficient upstream pressure during higher demand periods. The downstream set point can not be met.

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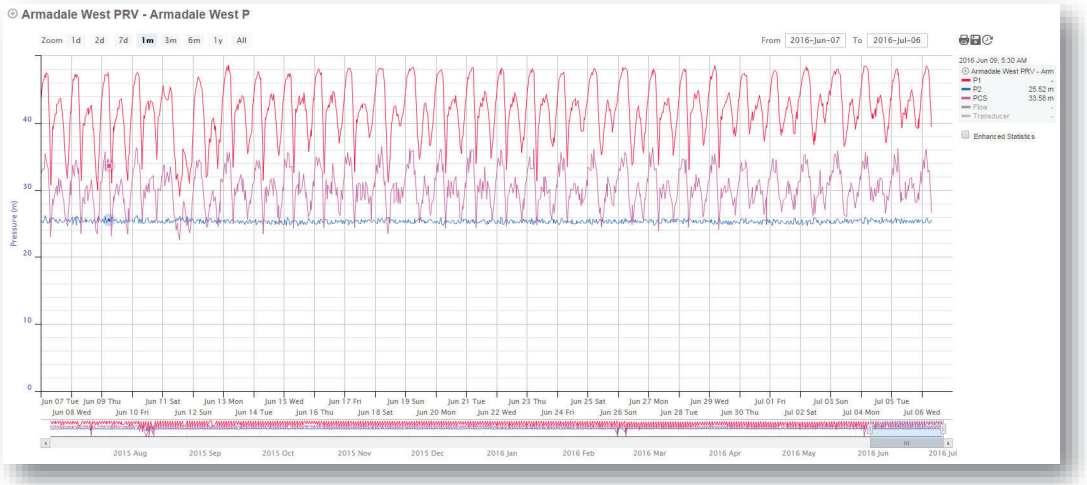
PRV Condition – unstable PRV



At peak flow the PRV is failing to meet the target downstream pressure. Upstream pressure varies and when it drops the PRV opens fully and the downstream pressure falls slightly below the set point. A greater dip in upstream pressure or decrease in the PRV's performance would mean failing to deliver the required downstream pressure.

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PRV Condition – Debris in the PRV

From 27th June it is clear that something is preventing the PRV from closing sufficiently at low flow; likely to be debris under the diaphragm. This caused downstream pressure to climb.

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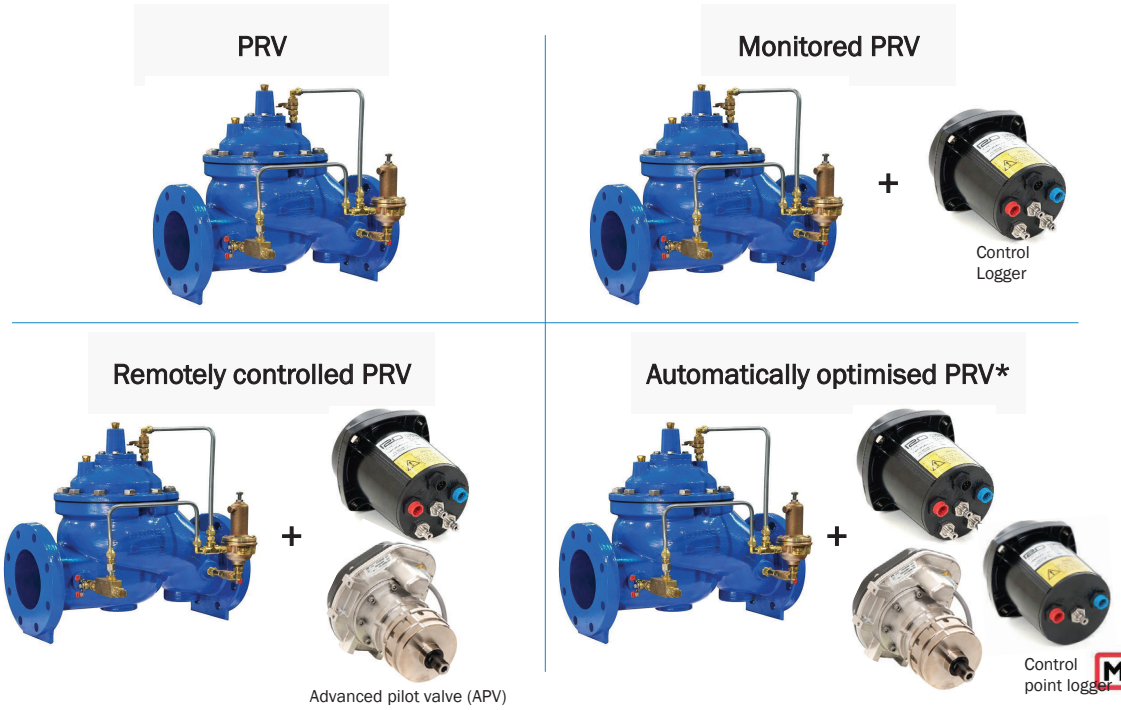
i20 PRV monitoring and control systems offer more accurate, stable, and smooth control of network pressures



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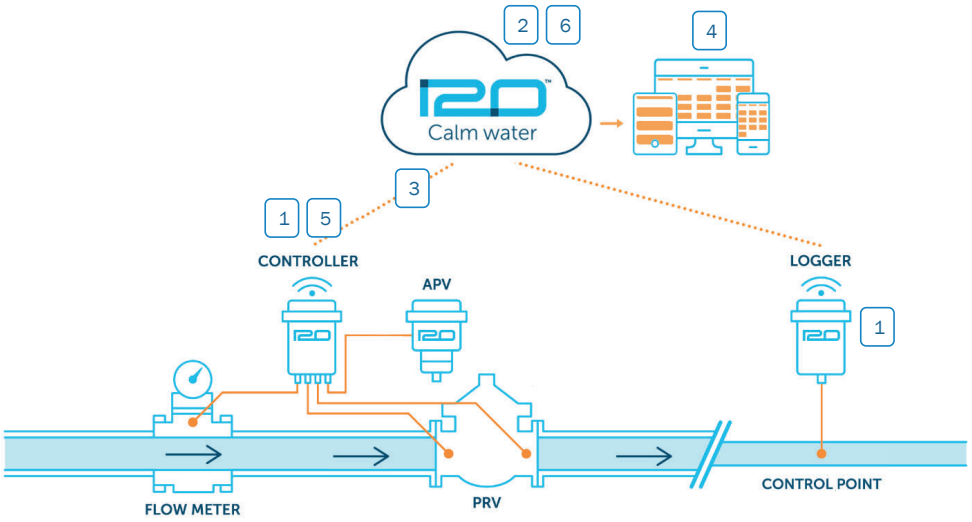
How i20 Advanced Pressure Management works

1. Flow and pressure data is recorded and sent to Sentryx cloud platform
2. Flow-related head-loss curve created using algorithm
3. Head-loss curve sent to PRV controller
4. Client sets target pressure for critical point
5. Controller reads flow in real-time and instructs the Advanced Pilot Valve what outlet pressure is required
6. Pressure and flow data re-analysed each day and head-loss curve updated if necessary



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i20 PRV control has a number of control modes

- Fixed downstream pressure
- Flow modulation using water company-defined outlet pressure table
- Automatic optimisation using outlet pressure table created by system algorithm
- Scheduling function for each and all control modes
- Ability to mix modes at different times
- Ability to schedule at least 1 year in advance

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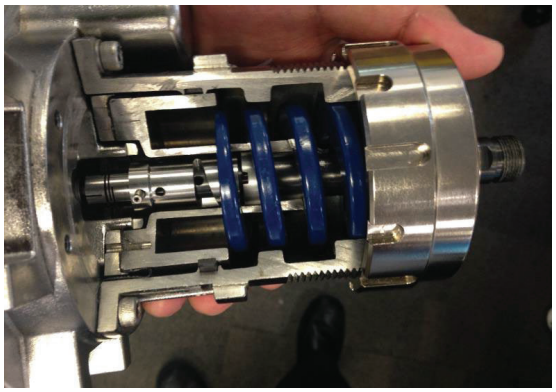
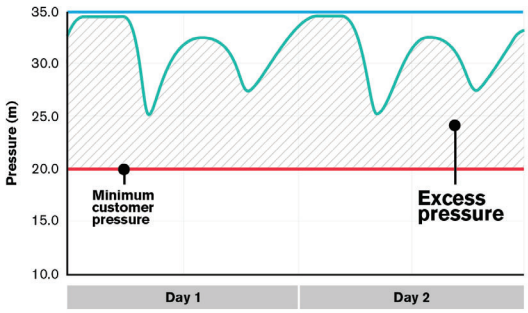
The i20 Advanced Pilot Valve (APV) is usually installed in parallel with the existing pilot and delivers precise and smooth pressure changes



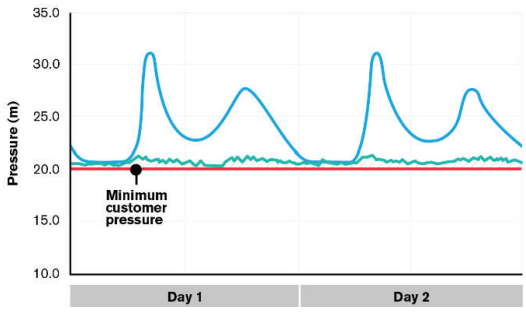
- The i20 control system uses a dedicated pilot valve – a high precision patent protected device designed for continuous actuation, providing precise and smooth control, and minimising battery power required to drive it
- Pressure can be set to reduce gradually over a defined time period to minimise customer complaints with minimum effort
- Ability to select control sample period to allow for unusual zone profiles
- Tunable fine control parameters to ensure the optimal settings for each zone

i20 Advanced Pressure Management is used to reduce over-pressure which in turn reduces leakage, bursts and open-tap demand. It delivers fixed pressure at the control point by varying the PRV outlet pressure.

BEFORE: fixed outlet pressure at the PRV with over-pressure in the network



WITH i2O: varying outlet pressure with minimal viable pressure for customers



PRV outlet pressure
Control point pressure
Minimum viable pressure

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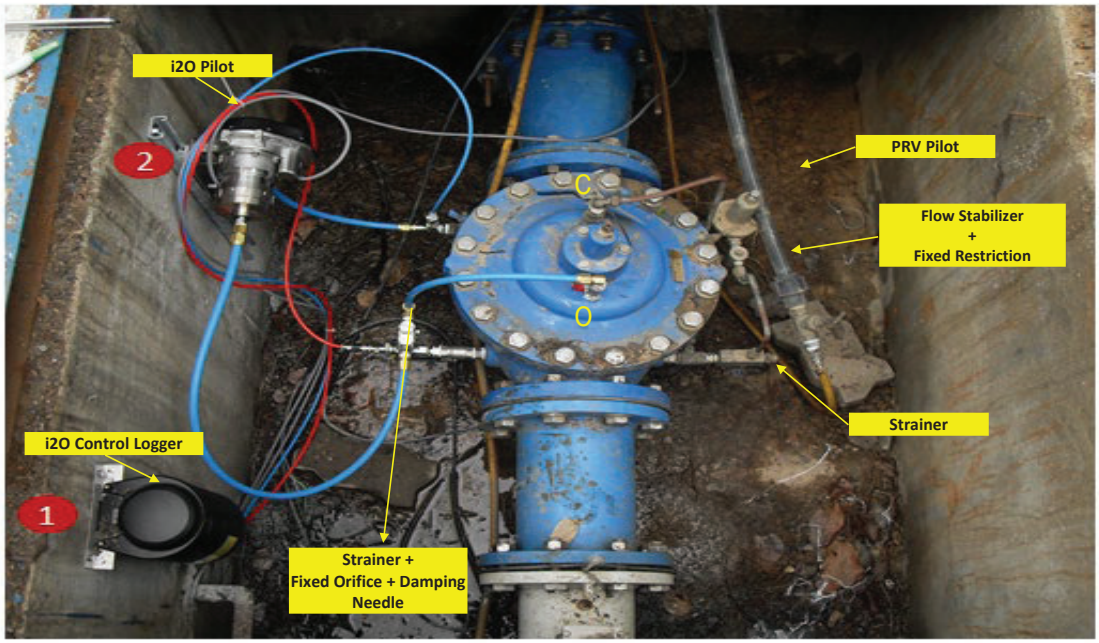
Typical Installation



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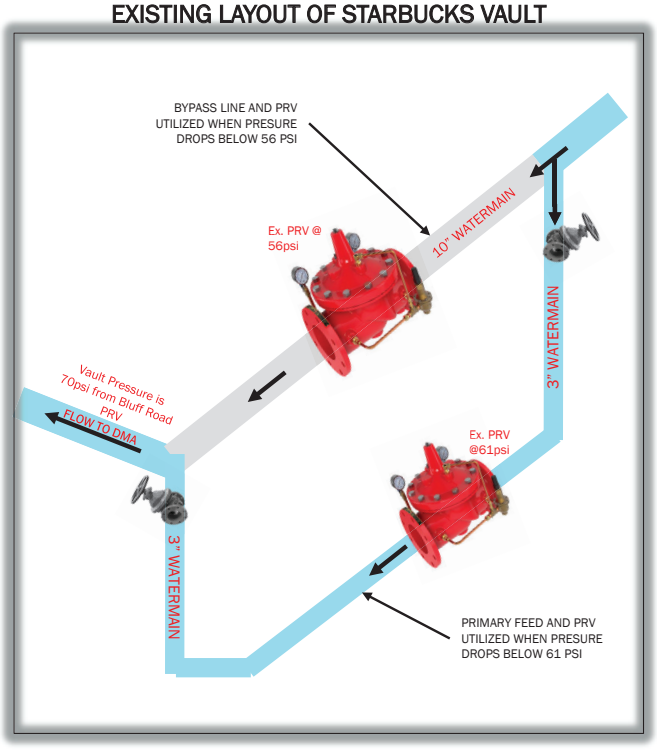
DMA Example

- Existing Layout
  - Existing PRV on smaller main is utilized to control pressure in the DMA.
  - Existing PRV on larger main is utilized should there be a large pressure drop in the DMA. This is utilized as a bypass line.
- Proposed Scope:
  - Primary (Existing) Valve to be utilized to control pressure in the DMA:
    - Mueller Consumption Meter for flow measurement via Mi.Node to Sentryx
    - i2O APV and Control Logger to regulate pressure
  - Proposed Singer Valve to be utilized during low pressure scenarios in the DMA:
    - i2O APV and Control Logger to regulate pressure
    - McCometer Insertion Meter and ProComm Go to compute volume and flow rates

EXISTING LAYOUT OF STARBUCKS VAULT



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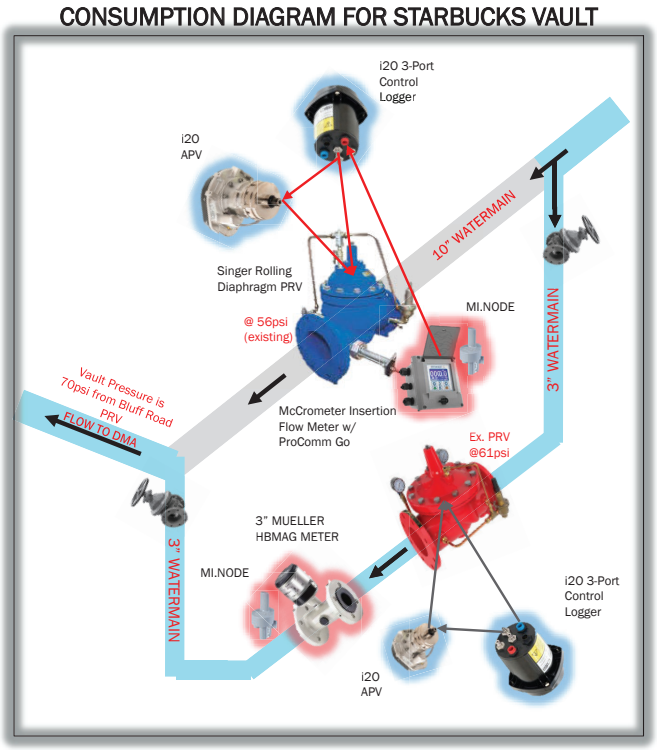
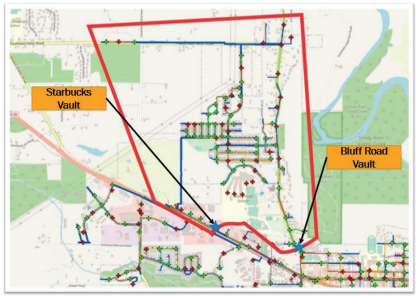
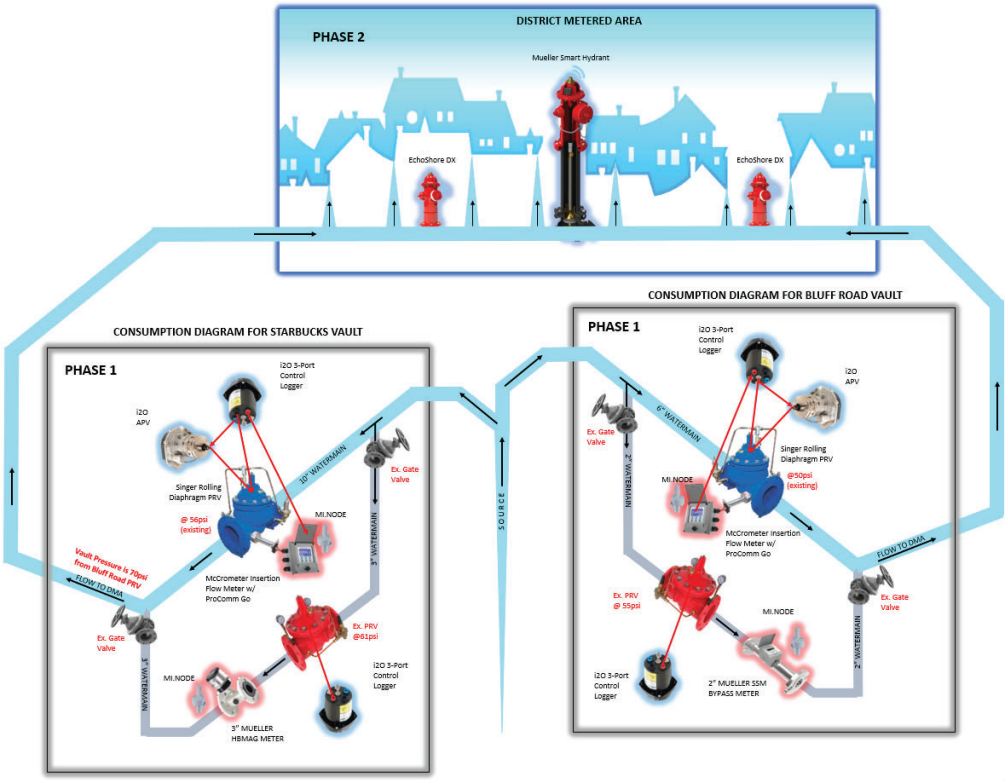


System Diagram





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Questions?

Logger Specifications

Wide variety of use cases	▪ Up to 3 pressures ▪ 10 or 30 Bar ▪ Bi-directional flow inputs ▪ Battery or mains powered ▪ Small size ▪ Geo-located ▪ Real time readings on Android device
Best connectivity	▪ 4G, NB-IOT or LTE-M with 2G fallback ▪ Internal aerial ▪ Standard external aerial jack
Physically robust	▪ IP68 ▪ Temperature operating range -20°C to +60°C ▪ Drop tested to 1.2m
Most useful data at most useful time	▪ Intervals down to 1 minute ▪ Sampling intervals down to 1 second ▪ connections down to 5 minutes ▪ Decaying alarms ▪ Pressure, flow, temperature, voltage, comms data channels ▪ Statistical values to infer transients
Easy to deploy	▪ Configuration using Android device or laptop ▪ Mount using bracket or cable-tie ▪ Quarter-turn camlock fasteners
Accurate	▪ Pressure transducers ▪ Total Error Band 0.2% of Full-scale (0°C to 50°C) ▪ Long term stability (drift) Typical 0.1%, max 0.2% per annum
Low lifetime cost	▪ Fully tested, warranted, with low failure rate ▪ Firmware upgradeable over-the-air ▪ SIM and battery change in field ▪ No need for recalibration ▪ Long battery life ▪ £0 cost to upgrade to control

Minimal data gaps

- Multiple antenna options: 1 internal, 4 external, any SMA-connector antenna
- Multiple comms options: 4G, IoT (NB-IoT & LTE-M) & 2G
- Very low rates of product failure <1%
- Long battery life and external battery pack used to ensure loggers continue to be powered
- Loggers record and store 12 months of data for all channels in non-volatile memory, and send data at the next successful connection
- Moved devices inherit configuration for the location automatically ensuring no incorrect configuration

Physically robust

- ISO 90001 quality accreditation
- Accelerated Life Testing of >10 years
- Loggers/controllers rated from -20°C to + 70°C
- Independently verified IP68 rating submerged at 1m for 28 days in 35°C water
- >1 year of operation submerged in up to 1m of water
- Vibration tested to ensure devices can withstand carriage
- Fully documented and effective RMA process
- Warranty returns <1%

Security

- Device cannot be dialled up, only outgoing comms, denying an attack vector
- Proprietary cable connection for local configuration

- Uses TLS 1.2 for encryption (being upgraded to TLS 1.3 currently)

- ISO 27001 certified
- Annual 3rd party penetration testing by CREST-certified consultants; report available to clients
- Multi-tenanted software service preventing access across tenants
- Secure by design
- Data encrypted at rest and in transit

- SSO (Single sign-on)
- Only Authorised Users can access their tenant
- Different permission levels
- i2O staff all security screened

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Data accuracy levels from i20 devices are very high

- 1 or 3 pressures from Swiss-made internal transducers. Pressure transducer accuracy of ± 0.1% Full Scale. Transducer accuracy tested during logger/controller production process. Pressure readings to 3 decimal places.
- Forward and reverse flow. Flow pulse capture rate of >= 100Hz.
- 1 year of data stored on the logger in non-volatile memory
- Logging period client-configurable from 15 minutes to 1 minute; data acquisition interval client-configurable from 1 minute to 1 second; data transmission frequency client-configurable from 5 minutes to 1x per day
- Clock accuracy of <= 10 seconds from a trusted time source
- Battery voltage, temperature, network signal strength all recorded and transmitted
- If used as a controller, adjustments to the PRV including the time of the adjustment, its magnitude, and whether it was opening or closing the PRV, and the pressure and flow measurements taken by the controller; who made a change to control parameters, when, and to what
- From a 3 pressure logger on a PRV: upstream, downstream, and control space
- Maximum, minimum and standard deviation values from 1 second acquired data

i20 pressure control includes multiple failsafes to protect the network

- Control maintained within the bounds of normal operating parameters in the event of a controller (battery/comms) failure
- Control maintained in the event of a flow meter failure
- Pressure maintained in the event of a high demand (fireflow, burst)
- The ability to stop adjusting the PRV if the difference between supplied upstream pressure and the current downstream pressure is less than a client definable value
- Ability to automatically reject a system derived pressure table that significantly varies from foregoing tables
- Data storage in the logger of 1 years' worth of data for all logged channels when logging at 15 minute intervals
- External battery pack option
- Control can be switched back to original pilot as a fall-back

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- Training in installation and use
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- Sentryx Intelligent Network will be used by all other Mueller products which monitor pressure and flow
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Aquaient Ultrasonic Meter

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I want my data straight into SCADA

- Mueller devices can't send data direct to SCADA
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  - In CSV format using secure data transfer. Export configurable to a client's specific requirements in relation to locations, data fields, and frequency.
  - External read/write API in development
- The advantage of the data going straight into the Sentryx software service is that all the algorithms can be run on it as it is received, and issues notified immediately

MUELLER

I want my devices to use only [T-Mobile, Verizon, AT&T] network

- Customers have sometimes had a bad experience with one network or another, and think they want devices to use 1 specific network. They don't need to do this to maximise the chances of successful data return, which is their desire.
- In North America, i2O devices use roaming SIMs from Eseye
- Roaming SIMs are a better answer than single network SIMs for ensuring that data is returned reliably. They appear to be newer to, and less well-known in, North America, but have been available internationally for many years, and i2O has used them for a long time. They are sometimes used in mobile telephony, and frequently in the machine-to-machine world. They are offered by companies who have struck agreements with multiple networks. The device that uses the roaming SIM will select the best available network at its location and use that; if the strength of that network declines they'll look again for a better network.
- Eseye has agreements with all 3 network providers T-Mobile, AT&T and Verizon. In this way an urban environment we will likely have a choice between any of the 3 networks; in rural environments there may only be 1 but we can provide the same SIM in all devices and we'll pick that network up; if a water company has a geography in which different networks are better in different areas than in others then roaming SIMs are the perfect solution as they will work in all scenarios – there is no binary selection of a single network provider required.
- Eseye have told us that that is fine for us not to have certified our products directly with Verizon because they have a higher level agreement with Verizon.
  - T-Mobile doesn't in any case require certification
  - We have successfully completed AT&T Trendi certification

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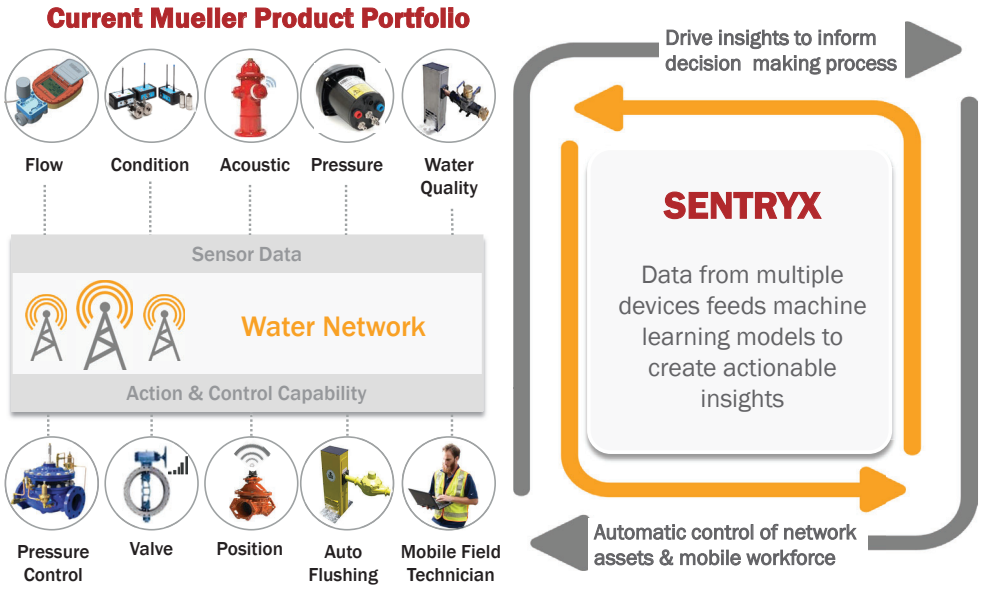
The Mueller Vision for Sentryx – Intelligent Software Platform



Water Network Administrators

Utilize Sentryx insights & visualization tools to:

Asset Managers

- Extend Asset Life
- Optimize and Prioritize Expenditures

Field Supervisors

- Produce Digital Workflows
- Plan Maintenance & Inspections

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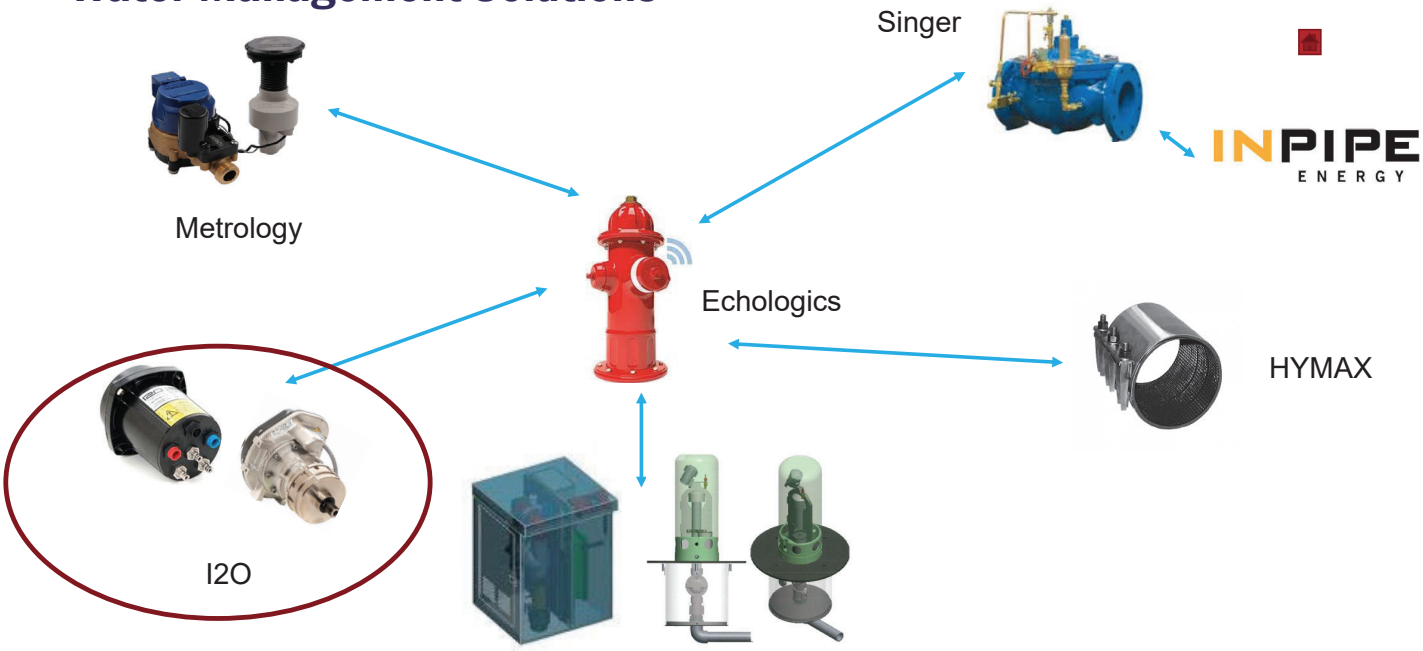
Water Management Solutions



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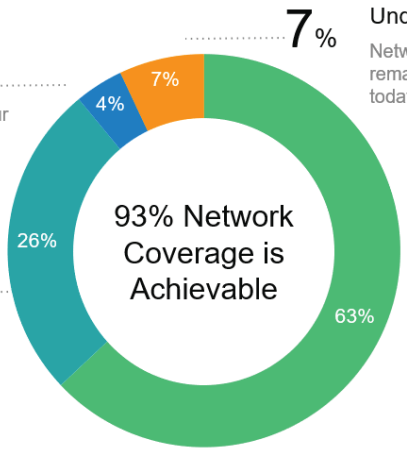
Why Monitor Your Network?



7% Undetectable

Network anomalies that remain undetectable with todays technology roadmap.

4% Flow Monitoring

Network anomalies that occur within households or commercial businesses. Frozen pipes, service leaks, burst water tanks etc.

26% Pressure Monitoring

Network anomalies that are detectable by pressure / transient monitoring. Bursts that are rapid caused by surges or catastrophic failures.

63% Acoustic Monitoring

Anomalies detectable by acoustic technology. Leaks that are slow growing: joint or corrosion based.

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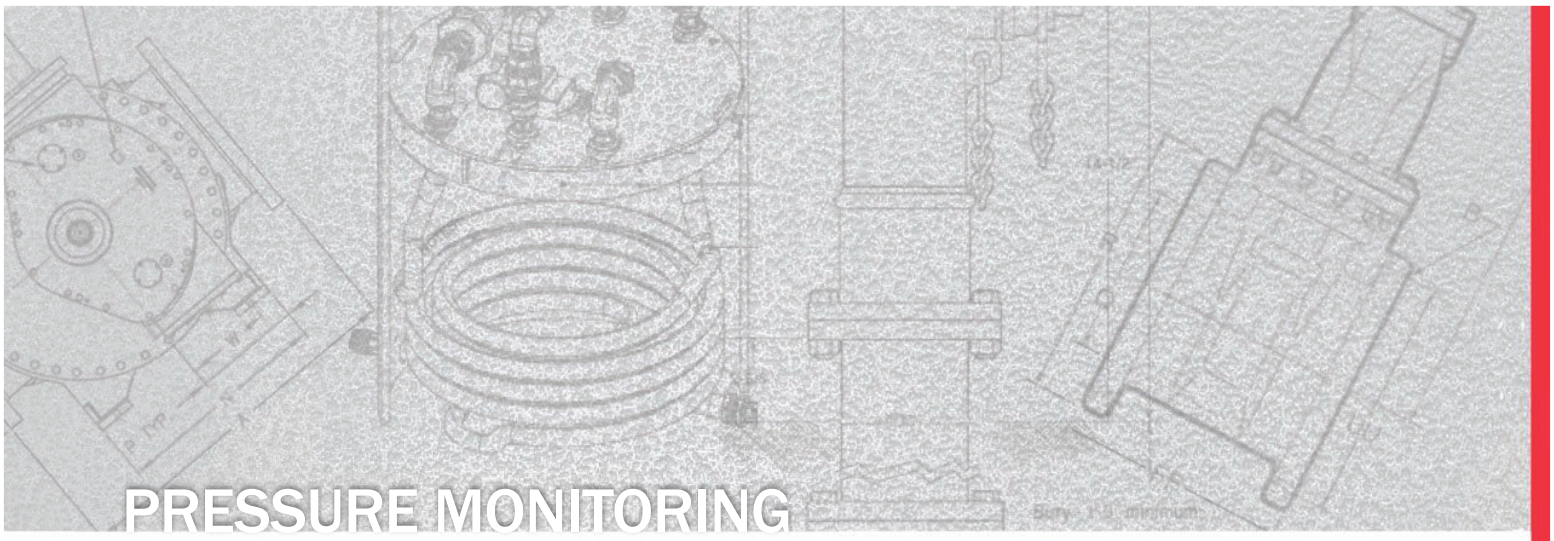
How do we achieve desired outcomes?

Utility Value	Acoustic Monitoring	Pressure Monitoring	Flow Monitoring	Pressure Control
Find slow growing leaks	✓	✗	✗	✗
Find bursts	✗	✓	✗	✗
Find Household leaks	✗	✗	✓	✗
Decrease break rate	✗	✗	✗	✓
Improve Speed / Quality of Repair*	✓	✓	✓	✗
Decrease Real Losses	✓	✓	✗	✓
Decrease Unavoidable Losses	✗	✗	✗	✓
Extend asset life	✗	✗	✗	✓



Pressure Monitoring...How? When? Where? What? Why?

How can Intelligent Water Technology™ benefit your distribution network?

- Continuous verification of system pressure data anywhere in the distribution network
- Remote data logging and performance analytics
- Near-time condition alerts
- Powered by long-life Lithium battery (10 years)
- User friendly web interface
- SCADA compatible with OPC Client protocol

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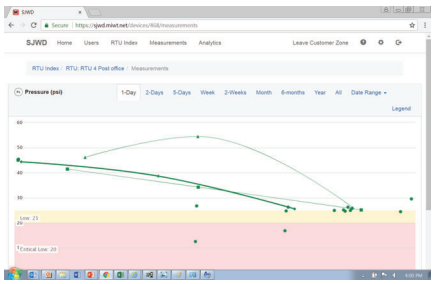
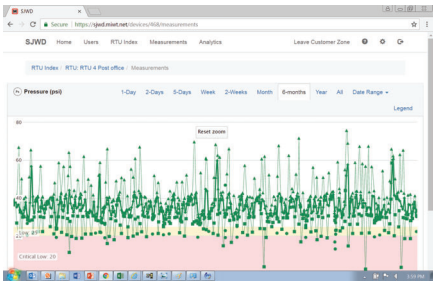
Pressure Monitoring...How? When? Where? What? Why?

How frequently can Mueller's hydrant monitoring system sample pressure?

- Multiple reading options in a "steady state" mode
- In a "transient state" mode the device will sample at rate of 4, 32, or 256 readings per second.
- Observance Mode...Know when pressure differentials are beyond your set points
- Sampling Mode...Raw data for hydraulic modeling



Steady State



Transient State

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In June 2021, Mueller acquired i20 Water whose pressure monitoring and control solutions are used by more than 100 water companies in more than 50 countries around the world

There are 3 products in the i20 portfolio, which are complementary to Mueller's Smart Product Lines

Pressure & Flow Loggers

- Monitor flow and pressure throughout your network using cellular data backhaul
- Deliver timely and valuable data you can rely on for decision making

PRV Controllers

- Pressure Reducing Valve (PRV) controller used with logger and pilot valve (APV) to regulate the pressure in water networks
- Highly secure, data can easily be integrated with other systems

Sentryx Intelligent Network

- Monitoring and analytics software platform
- Vision includes Sentryx Water Intelligence Platform integration (future state)

i20 Logger Variants

Single Pressure

Bi-directional flow

Triple Pressure

Bi-directional flow

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i20 loggers

- Highly robust flow and pressure remote logger with proven performance longevity.
- Over 20,000 units deployed worldwide.
- Available in 1P2F or 3P2F configurations. 0 -145 psi or 0 - 435 psi options with accuracy of ± 0.1% of FS.
- Local configuration available for initial start-up – followed by “over the air” upgrades using LTE-M cellular network (antenna options).
- 1Hz scanning capability for transient detection; configurable logging interval and communication schedule.
- Unmatched smart alarms using a decaying alarm principle.
- Under normal use, 5-year battery – user replaceable.

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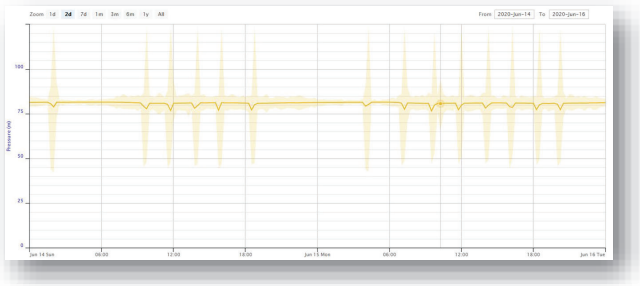
i20 loggers also collect uniquely valuable information

For Transient Detection at 1Hz:

- Mean
- Max
- Min
- Standard deviation



For PRV Monitoring:

- Inlet & Outlet Pressures
- Control Chamber Pressure for Performance Evaluation

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Graph Interface – Transient Detection

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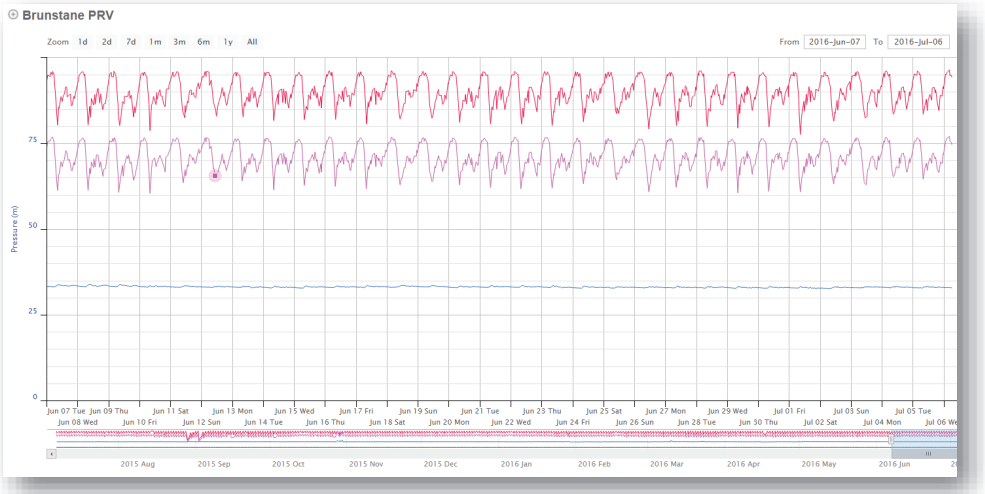
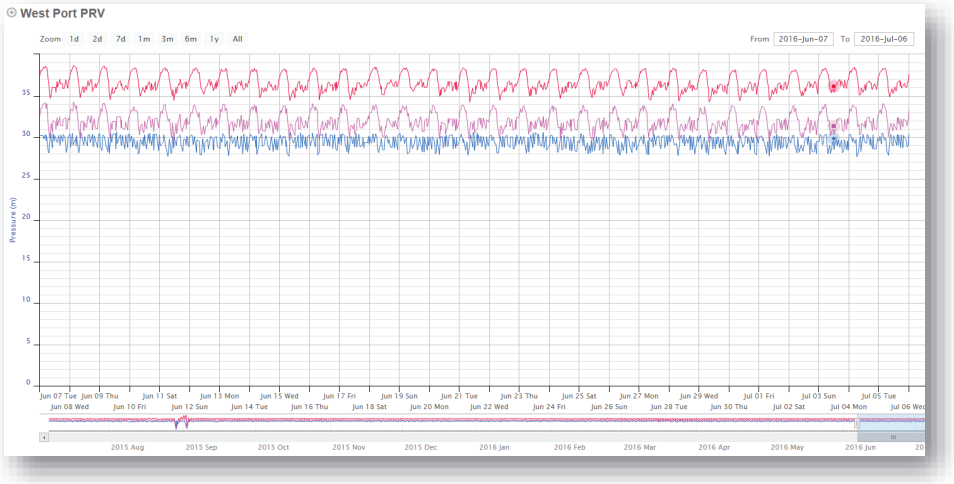
Automatic Event Detection

- Automatically detect events before they occur
- Works on any flow and pressure signals (i2O and other sources)

PRV Condition – PRV working well

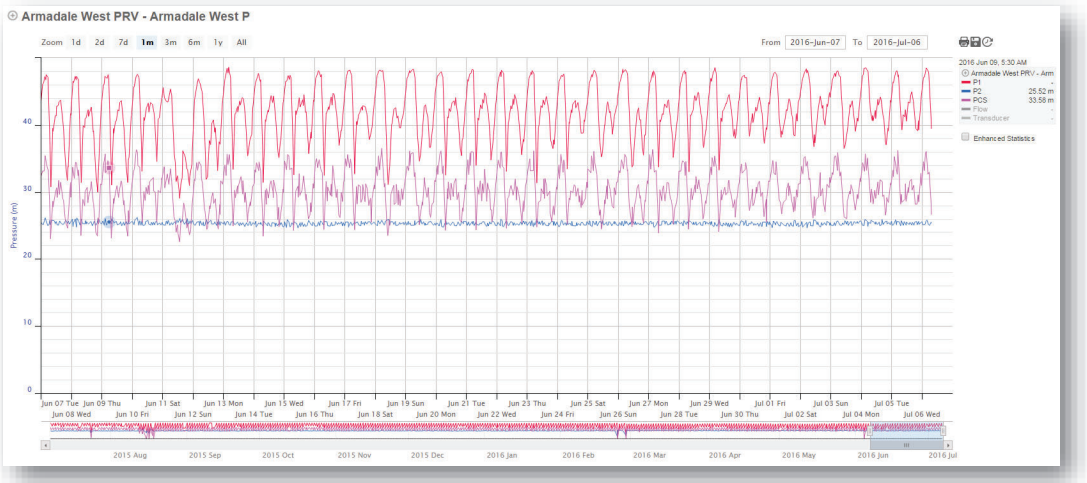


PRV Condition – unstable PRV outlet pressure



The downstream pressure is unstable due to insufficient upstream pressure during higher demand periods. The downstream set point can not be met.

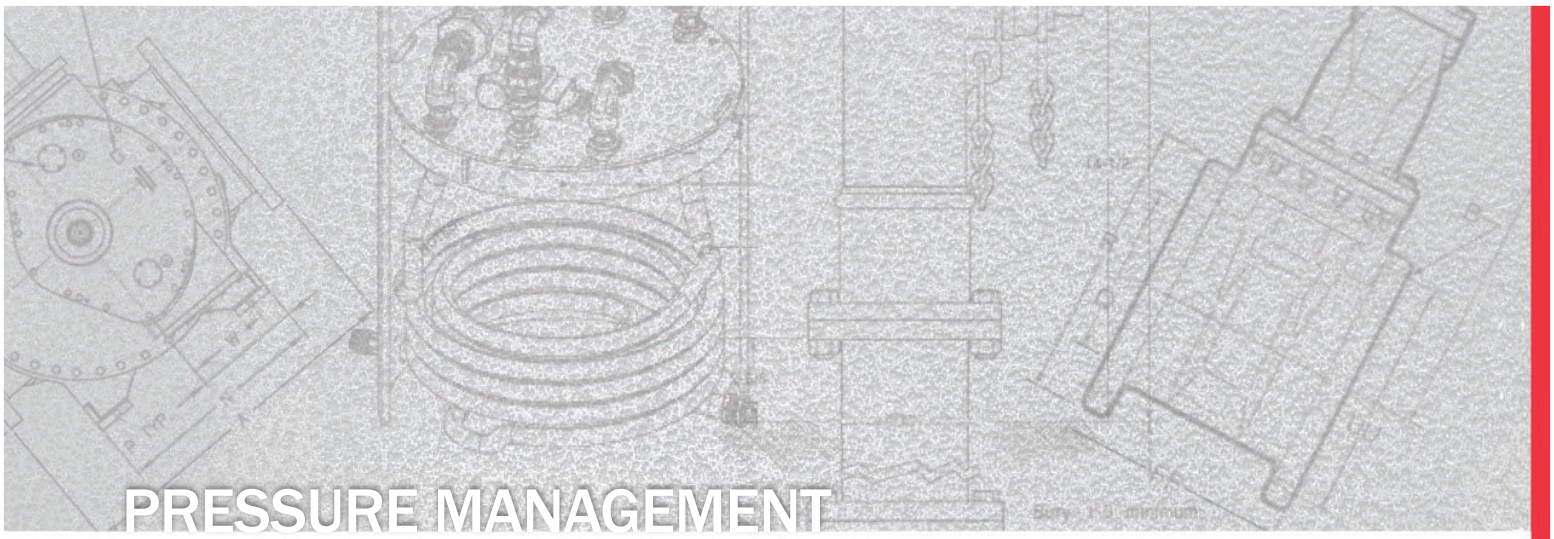
PRV Condition – unstable PRV



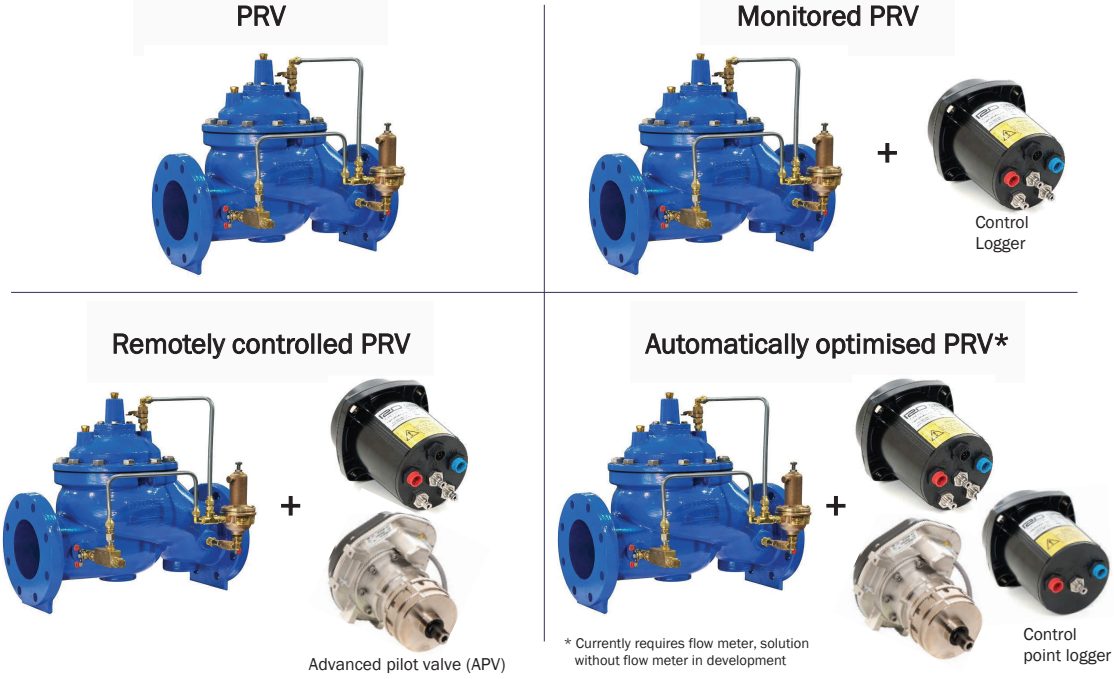
At peak flow the PRV is failing to meet the target downstream pressure. Upstream pressure varies and when it drops the PRV opens fully and the downstream pressure falls slightly below the set point. A greater dip in upstream pressure or decrease in the PRV's performance would mean failing to deliver the required downstream pressure.

PRV Condition – Debris in the PRV

From 27th June it is clear that something is preventing the PRV from closing sufficiently at low flow; likely to be debris under the diaphragm. This caused downstream pressure to climb.



i20 PRV monitoring and control systems offer more accurate, stable, and smooth control of network pressures



* Currently requires flow meter, solution without flow meter in development

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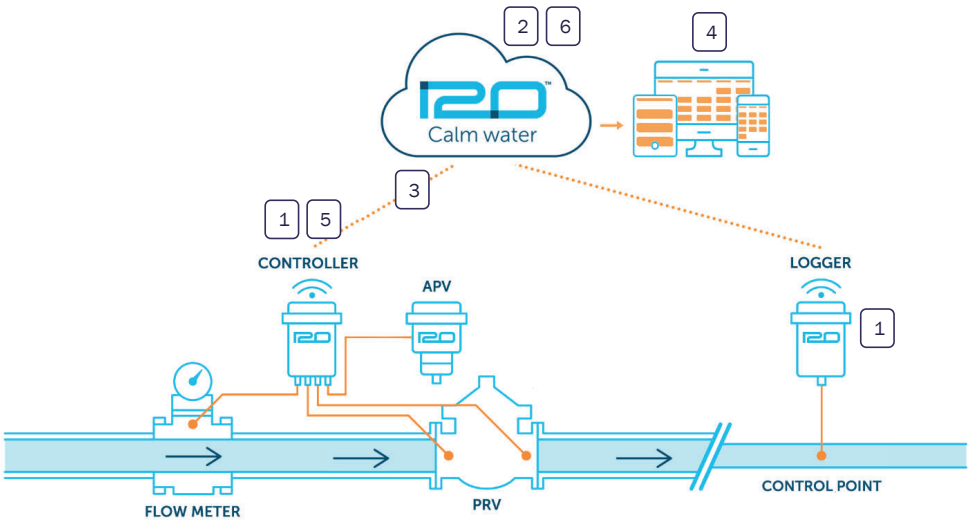
How i20 Advanced Pressure Management works

1. Flow and pressure data is recorded and sent to Sentryx cloud platform
2. Flow-related head-loss curve created using algorithm
3. Head-loss curve sent to PRV controller
4. Client sets target pressure for critical point
5. Controller reads flow in real-time and instructs the Advanced Pilot Valve what outlet pressure is required
6. Pressure and flow data re-analysed each day and head-loss curve updated if necessary



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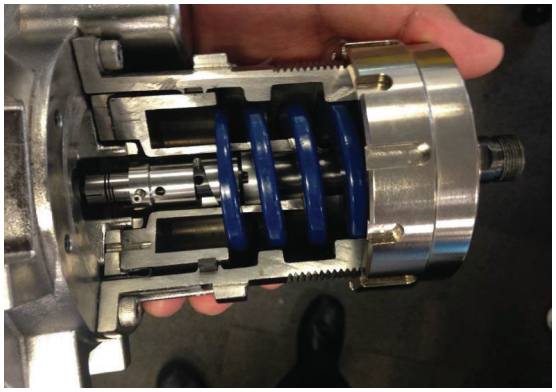
i20 PRV control has a number of control modes

- Fixed downstream pressure
- Flow modulation using water company-defined outlet pressure table
- Automatic optimisation using outlet pressure table created by system algorithm
- Scheduling function for each and all control modes
- Ability to mix modes at different times
- Ability to schedule at least 1 year in advance

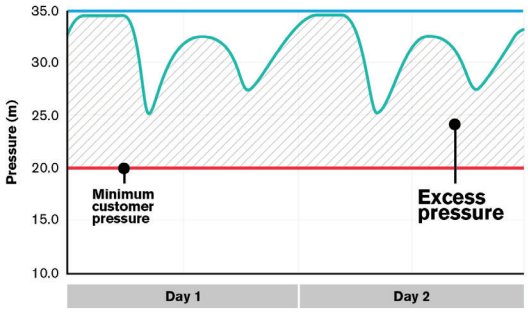
The i20 Advanced Pilot Valve (APV) is usually installed in parallel with the existing pilot and delivers precise and smooth pressure changes



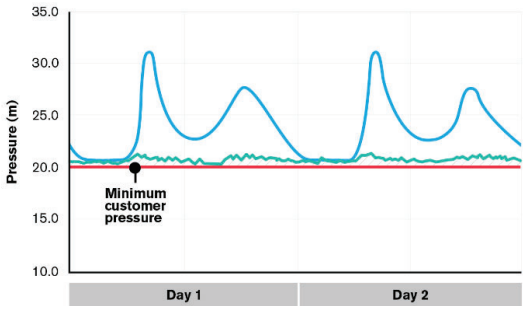
- The i20 control system uses a dedicated pilot valve – a high precision patent protected device designed for continuous actuation, providing precise and smooth control, and minimising battery power required to drive it
- Pressure can be set to reduce gradually over a defined time period to minimise customer complaints with minimum effort
- Ability to select control sample period to allow for unusual zone profiles
- Tunable fine control parameters to ensure the optimal settings for each zone

i20 Advanced Pressure Management is used to reduce over-pressure which in turn reduces leakage, bursts and open-tap demand. It delivers fixed pressure at the control point by varying the PRV outlet pressure.

BEFORE: fixed outlet pressure at the PRV with over-pressure in the network



WITH i2O: varying outlet pressure with minimal viable pressure for customers

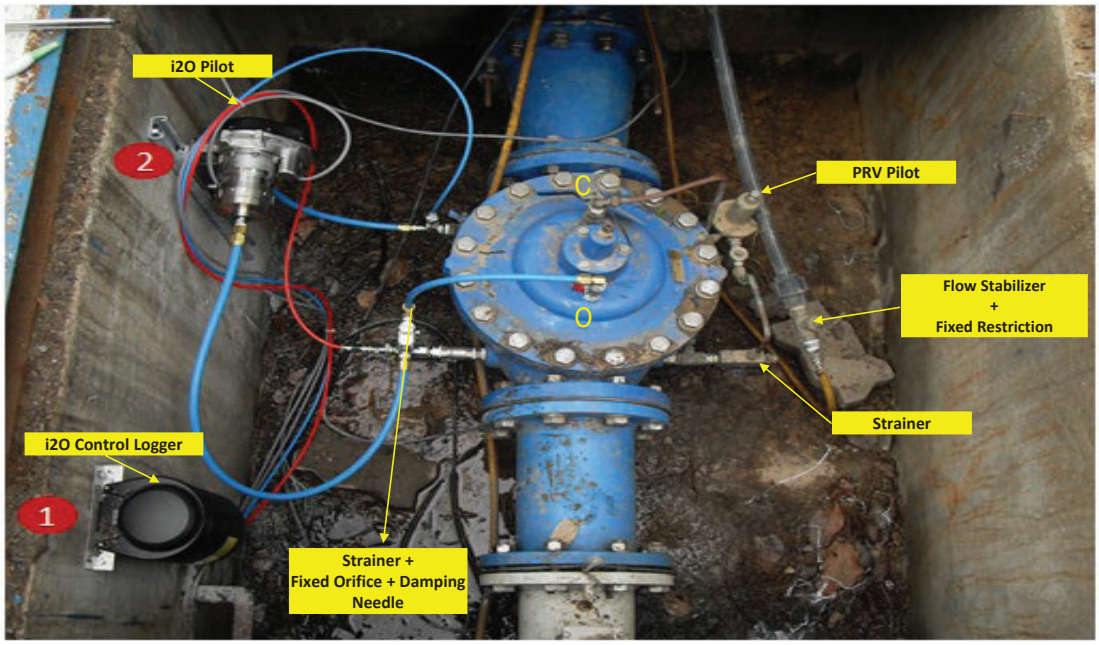


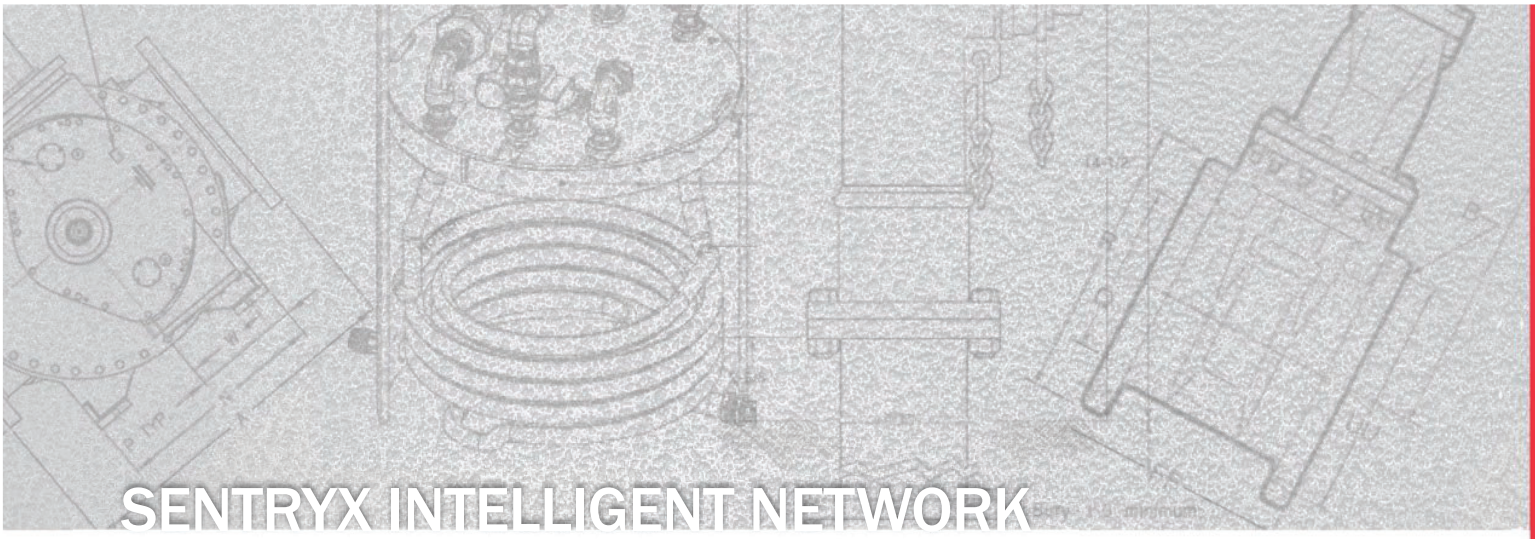
PRV outlet pressure

Control point pressure

Minimum viable pressure

Typical Installation





SENTRYX INTELLIGENT NETWORK

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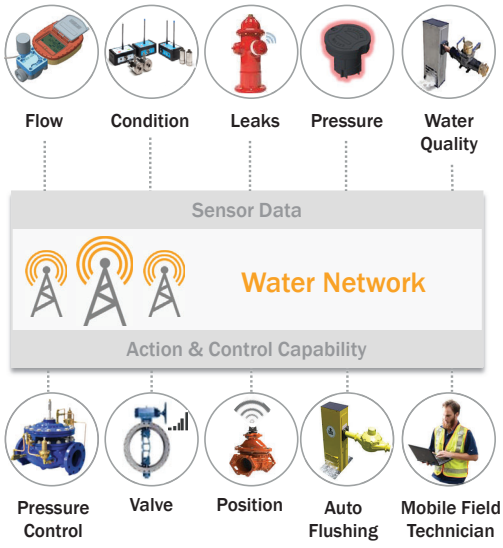
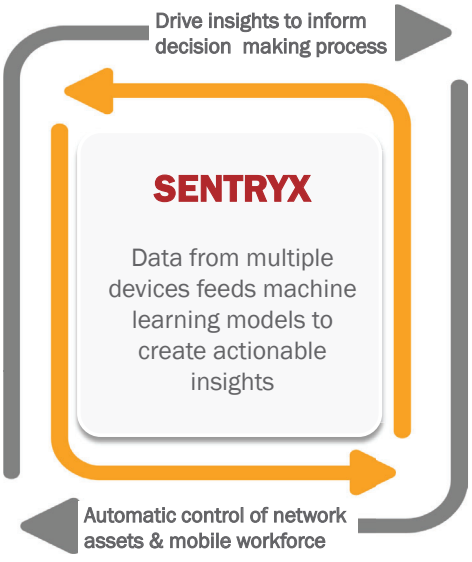
The Mueller Vision for Sentryx – Intelligent Software Platform

Connected Products via Sentryx that "Close the Loop" with Water Network Administrators & Assets

Current Mueller Product Portfolio





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- Optimize and Prioritize Expenditures

Field Supervisors

- Produce Digital Workflows
- Plan Maintenance & Inspections

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Data, insights, and device configuration/control settings are provided by the Sentryx Intelligent Network software service

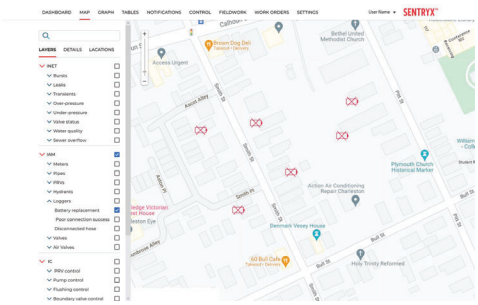
- Sentryx Intelligent Network has the following areas of functionality:
  - Visualization
  - Notification
  - AI/Machine Learning
  - Device configuration and Control settings
  - Data integration

SENTRYX™

- As part of the family of Sentryx software services, Intelligent Network includes
  - Single sign-on
  - Related look and feel
  - High levels of availability
  - High levels of information security (ISO27001)
  - Data available via API to other Sentryx software services, subject always to customer consent and legal compliance

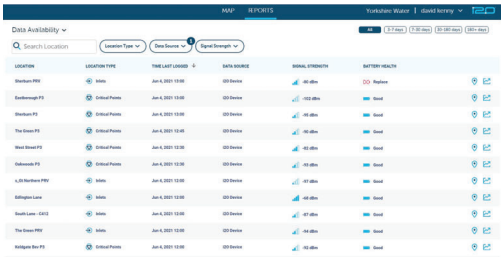
Information is visualized in multiple formats ensuring that it can be readily understood and actioned more quickly

Map



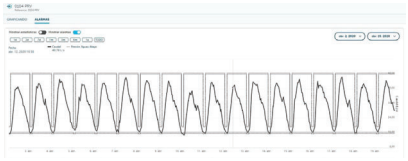
Graph

Table

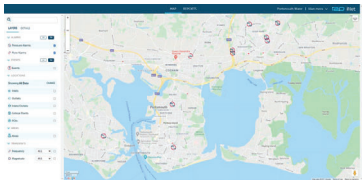


Alarm functionality provides notification of issues without having to be logged into the system

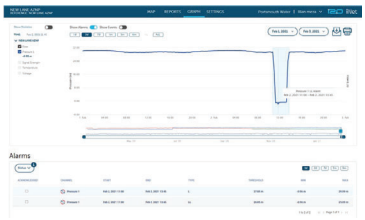
Assisted threshold setting algorithm



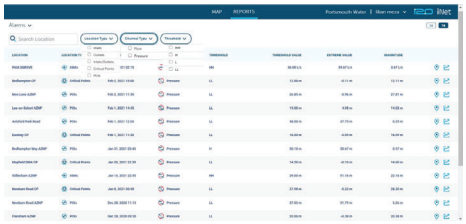
Filterable alarms on a map



Alarms in/under a graph

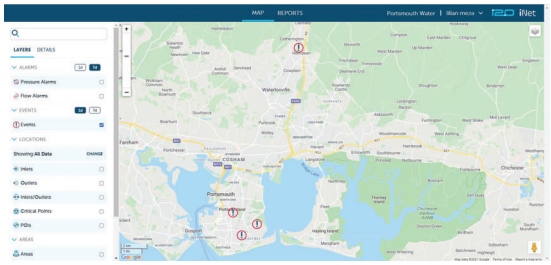


Alarms in a sortable/filterable table



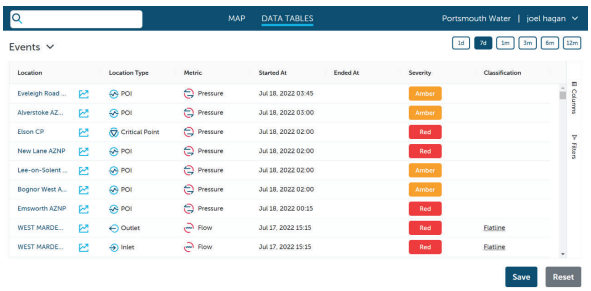
The eVader event detection algorithm uses AI/ML to identify anomalies in network performance

Detected Events on a map



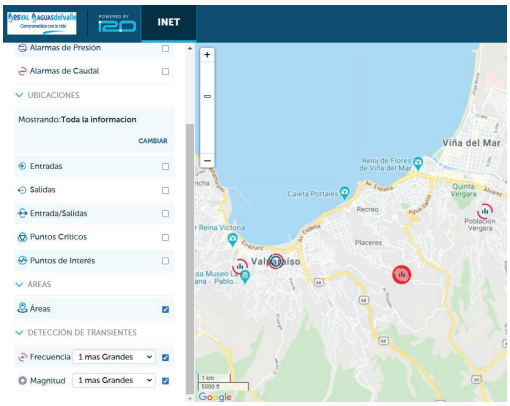
Detected Events in/under a graph

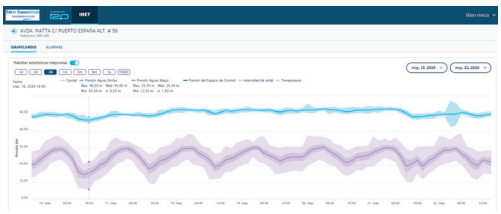
Detected Events table



The transient detection algorithm identifies transients using data from i2O devices

- Detect transients with i2O devices using the Enhanced Statistics mode
- i2O detects 100% of transients identified by expensive high resolution 128Hz loggers
- Transients identified are ranked by frequency and magnitude on the map
- Graphing shows the exact nature of the transient activity aiding diagnosis of the cause





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Data can be imported, or exported to integrate with other systems

- Data ingest from other devices or other systems
- Data extract from graphs
- Data export from the system in CSV format using secure data transfer. Export configurable to a client's specific requirements in relation to locations, data fields, and frequency.
- Ability to ingest data from other logging devices
- External read/write API in development

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The software service is very reliable: highly available and secure

- Amazon Web Services cloud-based software service accessible on any internet-connected device with 99.9% availability
- ISO 27001 accreditation since June 2018
- Annual penetration tests
- Intrusion detection with information security incident policy and process that includes client notification
- Multi-factor authentication with secure password access
- Physically secure data storage; encryption of data at rest and in transit
- Data destruction policy and processes
- Security screening for i2O employees

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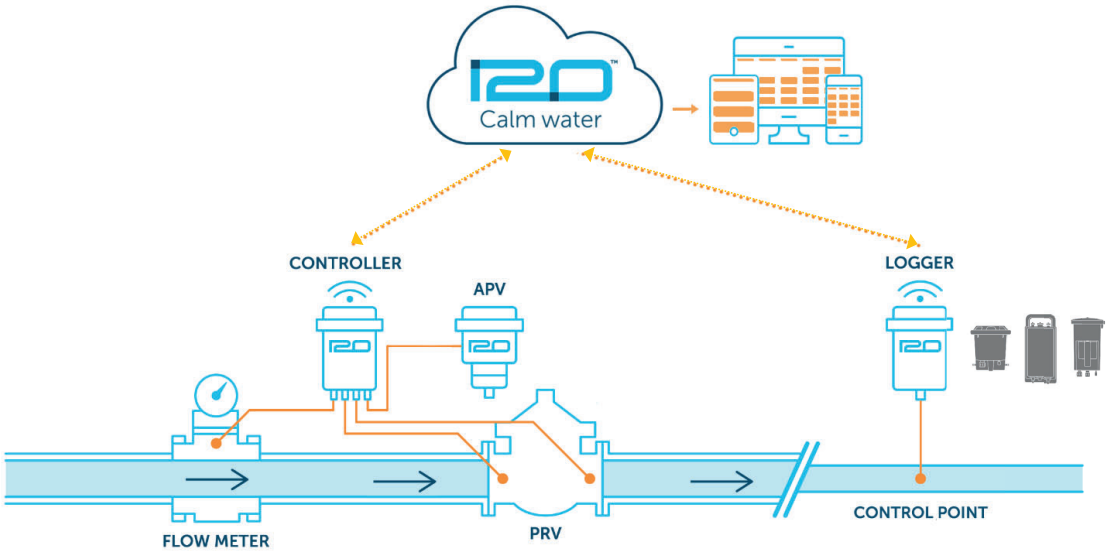
Questions?

Data accuracy levels from i20 devices are very high

- 1 or 3 pressures from Swiss-made internal transducers. Pressure transducer accuracy of ± 0.1% Full Scale. Transducer accuracy tested during logger/controller production process. Pressure readings to 3 decimal places.
- Forward and reverse flow. Flow pulse capture rate of >= 100Hz.
- 1 year of data stored on the logger in non-volatile memory
- Logging period client-configurable from 15 minutes to 1 minute; data acquisition interval client-configurable from 1 minute to 1 second; data transmission frequency client-configurable from 5 minutes to 1x per day
- Clock accuracy of <= 10 seconds from a trusted time source
- Battery voltage, temperature, network signal strength all recorded and transmitted
- If used as a controller, adjustments to the PRV including the time of the adjustment, its magnitude, and whether it was opening or closing the PRV, and the pressure and flow measurements taken by the controller; who made a change to control parameters, when, and to what
- From a 3 pressure logger on a PRV: upstream, downstream, and control space
- Maximum, minimum and standard deviation values from 1 second acquired data

i20 Advanced Pressure Management



i20 pressure control includes multiple failsafes to protect the network

- Control maintained within the bounds of normal operating parameters in the event of a controller (battery/comms) failure
- Control maintained in the event of a flow meter failure
- Pressure maintained in the event of a high demand (fireflow, burst)
- The ability to stop adjusting the PRV if the difference between supplied upstream pressure and the current downstream pressure is less than a client definable value
- Ability to automatically reject a system derived pressure table that significantly varies from foregoing tables
- Data storage in the logger of 1 years' worth of data for all logged channels when logging at 15 minute intervals
- External battery pack option
- Control can be switched back to original pilot as a fall-back

High levels of ongoing support

- Training in installation and use
- Online help centre, email, telephone and video support
- Support staff accessible in office hours. Out of hours support on a best endeavours basis
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- Customers have sometimes had a bad experience with one network or another, and think they want devices to use 1 specific network. They don't need to do this to maximise the chances of successful data return, which is their desire.
- In North America, i2O devices use roaming SIMs from Eseye
- Roaming SIMs are a better answer than single network SIMs for ensuring that data is returned reliably. They appear to be newer to, and less well-known in, North America, but have been available internationally for many years, and i2O has used them for a long time. They are sometimes used in mobile telephony, and frequently in the machine-to-machine world. They are offered by companies who have struck agreements with multiple networks. The device that uses the roaming SIM will select the best available network at its location and use that; if the strength of that network declines they'll look again for a better network.
- Eseye has agreements with all 3 network providers T-Mobile, AT&T and Verizon. In this way an urban environment we will likely have a choice between any of the 3 networks; in rural environments there may only be 1 but we can provide the same SIM in all devices and we'll pick that network up; if a water company has a geography in which different networks are better in different areas than in others then roaming SIMs are the perfect solution as they will work in all scenarios – there is no binary selection of a single network provider required.
- Eseye have told us that that is fine for us not to have certified our products directly with Verizon because they have a higher level agreement with Verizon.
    - T-Mobile doesn't in any case require certification
    - We have successfully completed AT&T Trendi certification

Agenda Item

DATE: July 2, 2024

TO: Engineering Committee, Calaveras County Water District
Michael Minkler, General Manager

FROM: John Coleman, Water Resources Manager

RE: Douds Fuel Break Project Update

SUMMARY

CCWD received an award from the USDA Forest Service of $393,100 in the Fall of 2024. The Doud's fuel break is a fuel reduction project that will reduce fire fuels on 148 acres of privately owned land and would support and fill a gap in the much larger "Hwy 4 Wildlife Defense System." Originally, the objective was to complete the work in 2024, however, with many factors still to be considered, it will mean the work will be completed in 2025. CCWD will be acting as the fiscal agent and working with the CalAms Teams to complete the project. Funding for the project is available until August of 2028.

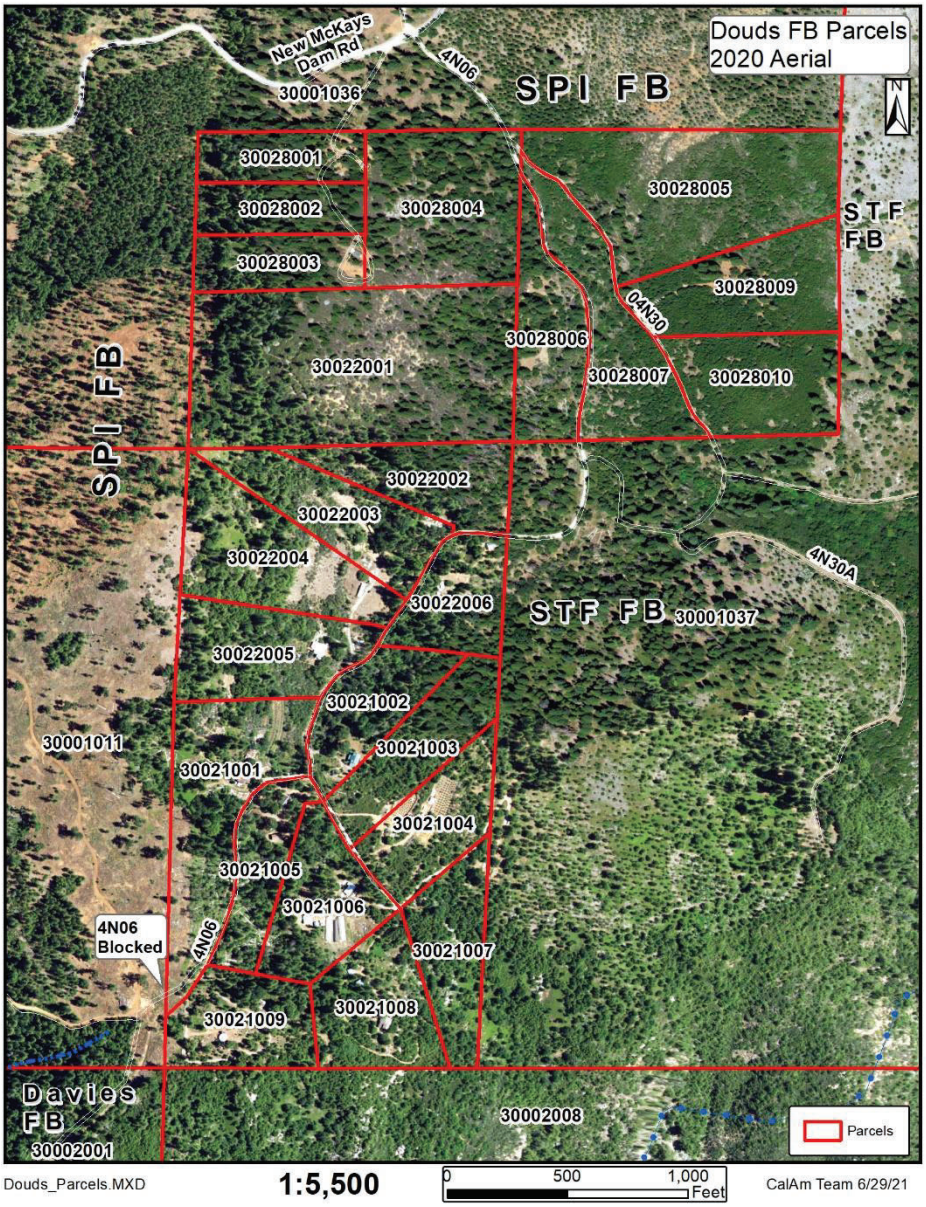
We have received legal notice that Davis-Bacon requirements do not apply since this is a fuel reduction project. CCWD will be issuing a Request for Proposal (RFP) under Federal Law.

Four parcels still need to sign the Right of Entry agreement, of which three of the four should not present a problem. However, one critical parcel has not agreed to allow entry to their property for work, which must be resolved. For this property, CCWD is working to find a resolution to access the parcel.

FINANCIAL CONSIDERATIONS

Zero Match. Internal staff time for payment processing on contractor award.

Attachments:
1) Parcel Map



Map 3. Douds Fuelbreak. While the Douds community is surrounded by fuels reduction projects on SPI and STF land, the fuel load in the community itself continues to increase. In addition, USFS Road 4N06, the only ingress/egress route, is blocked by logs strung along the private land side, and an existing young plantation and log deck on SPI - leaving the Douds community without an escape route.

Agenda Item

DATE: July 2, 2024

TO: Engineering Committee, Calaveras County Water District
Michael Minkler, General Manager

FROM: Engineering Department

RE: Capital Improvement Project Updates

AMI / AMR Project (CIP 11096)
Staff are reviewing options to utilize the unused funding and purchase controls for PRV Stations.

Jenny Lind Water System A-B Water Transmission Pipeline (CIP 11088)
A town hall was held at the Jenny Lind fire station on June 4th. DA Woods has been receiving piping materials for the Project. Construction CMS have been placed around the project. Northstar Engineering started construction staking. Staff are working on completing the pre-construction submittals. An onsite construction kick-off meeting is scheduled for Monday July 8th.

West Point Water Supply Reliability Improvements (CIP 11106)
Project is substantially completed; Staff is working with Gold Electric and Tesco to complete the final electrical punch list items.

West Point and Wilseyville Wastewater Consolidation Project (CIP 15091)
Gravity line and Force main are complete. KWE started excavation of the pump station. Multiple issues with the Plans, CCWD is responding to RFIs and submittals this week. Electricians are scheduled to be onsite this week. KWE is working on sludge lagoons, grading base and then will adjust slopes. Construction needs to be completed by October. We might need to file for extension. Bob Godwin is working on report and water balance for Water Resources Board.

Copper Cove Lift Stations 6, 8, 15 & 16 and Lift Stations 12 & 13 Force Main Bypass Project (CIP 15076/15080)
Lift station 6 equipment and controls passed factory Testing; Lift Station 15 has some corrections that need to be made. Mozingo is working on Electrical Service for PG&E at Lift Station 6. Factory testing scheduled for Wednesday (6/26/24) for Lift Stations 6 and 15. PG&E needs to be scheduled for the inspections by the end of June to secure our construction for the season.

Copper Cove Wastewater Treatment Plant Tertiary Treatment Improvements and Facilities Plan (CIP 15094)
U.S. Army Corps of Engineers recommends “staying the course” and see if an early procurement is possible for the SAF system. One consideration is to revise the existing Letter Report to add an additional step, procuring and installing the pretreatment SAF system. HydroScience delivered an unofficial 50% design; District staff reviewed; CCWD needs to decide on solids handling process. Dewberry submitted a draft Biological Report for Corps review. The project schedule indicates that construction would start in August of 2025.

Copper Cove Wastewater Treatment Plant – Pond 6 Dam and Effluent Storage Reservoir Enlargement Project (CIP 15112)
Project Team determined that the treatment improvements project is separate from dam enlargement project. Funding for dam enlargement (plus pipeline relocations) has been authorized by the US Congress and is included in the USACE fiscal year workplan.

Copper Cove Water System Improvements Project (CIP 11083C)
B-Tank coating should be completed within the next couple weeks. Crosno has completed the erection of the clearwell tank. It will take approximately two months after the painting before the tank can be filled. Scheduled shutdowns on treated water piping/clearwell will occur around September. Once the new tanks are online rehabilitation of the existing tanks will start.

Copper Cove B-C Transmission Pipeline & Pump Station (CIP 11122)
The District received 50% design plans from PBI and Kevin and Ops responded. A meeting was held with PBI to go over the redlines. PBI will revise the Potholing Plan and we plan to issue a contract for Potholing to one of our Contractors. The final design/bid documents should be ready this summer.

Ebbetts Pass Hunters Raw Water Intake Pumps (CIP 11103)
Waiting for Approval from FEMA for phase 2 construction; Finance is working on financial audit request from FEMA. Biological monitoring for Spotted Owls was completed by Santec and forwarded to USFWS.

Ebbetts Pass Redwood Tanks Hardening (CIP 11095)
FEMA approved the additional Grant funds of $739,634.25 to fund this Project completely.

Arnold Wastewater Secondary Clarifier Improvements Project (CIP 15095)
Grant Application was submitted to the Clean Water State Revolving Fund. We received notice that there are no funds available in the current Fiscal Year, but our application may be reviewed for future consideration. Staff are working on applications to the USDA.

Huckleberry Lift Station (CIP 15092)
Received six proposals from Consultants for Design. The Professional Service Agreement (PSA) was awarded to Lumos Engineering. We are having a kick-off meeting in July.

La Contenta Biolac, Clarifier, and UV Improvements (CIP 15097)
The District received two proposals for design services. Staff have reviewed the proposals and need to bring them to the board for approval.

Jenny Lind Clearwell #2 Rehabilitation (CIP 11083)
Start of construction to be October 2024.

Agenda Item

DATE: July 2, 2024

TO: Engineering Committee, Calaveras County Water District
Michael Minkler, General Manager

FROM: Engineering Department

RE: Other Updates

Copper Valley Town Square
Staff continue to work with CV Development Partners LLC on key issues and proposed development. These include planned redevelopment of the Copper Valley Square complex. The discussion includes requirements for off-site facility improvements including a permanent sewer force main and new lift station on Little John Road to serve Copper Valley Square (convey sewer to the wastewater plant) as well as rehabilitation of the existing lift station within Town Square. Also, the pre-existing water booster pump station serving the Copperopolis Zone has never been upgraded and is limited to 100-gpm. A new water booster pump station is needed to increase potable water delivery to Copper Town Square. These required off-site improvements are part of the original facilities agreement approved for Copper Town Square.

CV Development authorized a Closed-Circuit TV inspection for sewer gravity main on golf course, a 120-foot segment of gravity sewer was discovered to have sag and shall be addressed to accommodate sewer flows at the proposed tie-in location in saddle creek subdivision for the force main from Town Square.

A field survey was conducted, and progress is being made on the design of Reeds Turnpike Pump Station. Flow deficiencies were highlighted during the recent Copper Cove fire.

Staff is reviewing the latest improvement plans that were submitted to the District for Copper Town Square.

Gold Creek Subdivision Unit 3
Staff is working with the developer to address the improvement and other pending fees to get the development back on track.

Jenny Lind Elementary School Force Main Project
This project includes a 20,000-ft sewer force main from the Jenny Lind Elementary School to a connection point with CCWD existing sewer system near Vista Del Lago. The project

is being funded by the Clean Water State Revolving Fund (CWSRF) and CCWD has entered a prior Letter Agreement with the School Board. The design phase is complete and under review by the State Architect. Project cannot move forward until the SRF approves a schedule extension.

North Vista Plaza / LGI Homes

LGI Homes (Developer) has submitted an environmental impact technical memorandum highlighting the potential impacts of upsizing the existing 6" sewer gravity main in the Cosgrove Creek area. This study aligns with the previous concerns of potential impacts and extensive environmental work it would require for a successful project. The developer has submitted a memorandum on the 4 options that were developed in previous reports for a sewer lift station and force main to pump sewage from proposed development to Huckleberry Lift Station. District staff is working on reviewing the associated costs with Developer preferred approach of a Lift station and force main along Vista Del Lago road.