skm

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Professional Engineering Services Proposal

City of Beaumont
Lift Stations PLC Project

March 2020

Electrical

Instrumentation

Controls

SCADA

TABLE OF CONTENTS

SECTION 1 - COVER LETTER | EXECUTIVE SUMMARY

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Jeff Hart, Director of Public Works
City of Beaumont
550 E 6th Street
Beaumont, California 92223

March 6, 2020

RE: Cover Letter | Executive Summary
Professional Engineering Services Proposal for the Lift Stations PLC Project

Dear Mr. Hart,
Thank you for the opportunity to present our proposal to provide the City of Beaumont with professional engineering services. We are qualified and committed to providing you with electrical engineering for PLC replacements with regard to the ten (10) Lift Stations identified in the Scope of Services.

Our team is at your service. We value our relationships with our clients and will work hard to give you the support you need to see effective and sustainable results. We employ clear and concise communication throughout the entire engineering process to manage resources well and identify opportunities to improve systems and inefficiencies. We have enjoyed working with the City for the past few years and hope to continue working together to provide electrical and controls solutions and support. SKM is distinguished by its reputation of providing exceptional technical engineering services directly to Cities and Districts and also as a subconsultant to a number of civil engineering firms. We ensure the highest level of expertise while maintaining low overhead that keeps us agile and innovative in our workflows. We are determined to provide the City with the best possible electrical and control engineering services possible and appreciate your consideration in selecting SKM.

In response to the City's request, our proposal outlines our understanding and approach to successfully completing the scope of work. SKM has extensive experience in these areas and has the capabilities to properly execute key objectives. We are intimately familiar with each lift station and fully understand the current conditions and needs for improvement. Each lift station should have a control system that operates reliably, is easily monitored and controlled, and is simple to configure, troubleshoot and maintain. The communications methods used to relay information back to the City's SCADA system are critical for long-term monitoring of each station. Our team understands the various hardware, software, and communications options available and will assist the City in making these critical decisions. We will work together with your staff to come up with the best solution for the City that takes into account reliability, ease of use, maintenance and cost.

We look forward to working with you to improve the reliability and control of your critical lift station infrastructure. SKM is the right partner to help the City modernize and take advantage of exciting and new technologies. We appreciate this opportunity and hope to continue to work with the City with electrical and control needs.

Sincerely,

Principal

Mark Jeppsen, P.E.
mark.jeppsen@skmeng.com
(801) 694-4529

SKM Engineering
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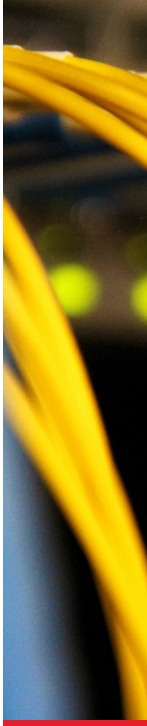
(801) 677-0011

skmeng.com

SECTION 2 - INTRODUCTION / INFORAMTION

INTRODUCTION / INFORMATION



In 1999 SKM began providing electrical engineering services to Aqua Engineering in Bountiful, Utah to help fill a gap with various wastewater projects. We quickly learned that there was a need for quality electrical engineering and system integration, particularly for smaller municipalities and districts. Over the following twenty years we have slowly grown our firm with a focus on quality and reliability. Our staff of 23 provides services for over 100 clients of all sizes as well as to various civil engineering firms. As an engineer, we are uniquely qualified to design control systems largely because of our abilities as a system integrator. As a system integrator, we are uniquely qualified to implement systems well, largely because of our background as electrical engineers.

For the City of Beaumont and it's critical lift station infrastructure, we will be able to assist the City in making sound decisions based upon our unique background as an engineer and system integrator. We have a deep understanding of electrical gear, motor controllers, programmable controllers, communications networks, control system software and hardware as well as vendors and market share and trends. Our team will know when and why certain products will be a good option and we'll be able to exercise caution when a product has a really great sales pitch but may not be a good fit.

If selected, SKM will first provide the lift station evaluation and assessment to better understand short term and long term needs. We already are very familiar with the lift stations having visited each one as well as studied the current control logic. SKM will take the lead on the electrical, instrumentation and controls evaluation. ~~We will be subcontracting Aqua Engineering and Webb Associates to take the lead on evaluating the lift stations from a process and capacity standpoint.~~ Our team will work closely with City Staff and together we'll develop recommendations to move forward towards modernizing each lift station. Together we'll evaluate current technology and products and look for a solution that is robust, reliable, simple to use, easy to maintain and cost effective.

Information

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Contact: Mark Jeppsen, PE | mark.jeppsen@skmeng.com | 801-683-3760
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Telephone: 801-677-0011

~~Subconsultants~~

~~Firm: Aqua Engineering, LLC~~
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~~Address: 533 W 2600 S, Suite 275, Bountiful, UT 84010~~
~~Telephone: 801-299-1327~~

~~Firm: Albert A. Webb Associates~~
~~Contact: Brian Knoll, PE | brian.knolll@webbassociates.com | 951-248-4279~~
~~Address: 3788 McCray Street, Riverside, CA 92506~~
~~Telephone: 951-686-1070~~

SECTION 3 - PROJECT APPRAOCH

PROJECT APPROACH

Our Approach | Scope of Work

The scope of work has been divided into three tasks, 1) Project Management; 2) Data Collection and Assessment of Existing Lift Stations; and 3) Recommended Upgrades, Improvements and Alternatives.

Task 1 - Project Management

SKM will have a project manager who will manage the project, develop the project schedule, track progress and ensure collaboration between our staff and City Staff.

Task 1.1 - Project Kick off Meeting - This meeting will be held online through Teams

Following selection and contract negotiation, our team will start the project with a kickoff meeting with City Staff. The Kickoff meeting is our opportunity to hear the concerns, issues and desires of each staff member as well as a time for any technical questions the staff may have. It is important that operators, managers and IT staff attend this meeting.

Task 2 - Data Collectin & Assessment

After the kickoff meeting, the data collection and assessment of each station will commence. SKM has already been to each lift station, has existing drawings, photos and programming files. We understand that the current radio system has obsolete hardware and requires multiple repeaters which increases the number of single points of communication failure. We know that the PLC's and touch screens are aged and obsolete. In addition, some of the control circuits are limited (such as the physical HOA switch status isn't tied into the PLC) and should be updated. Our team will spend additional time evaluating existing starters, soft starters and VFD's, most of which are also aged and due for replacement. We will evaluate existing instrumentation and redundancies. - This will be done remotely with City Staff providing assistance by taking photos of the existing components.

~~Lastly, we will include a high level evaluation of the structural, mechanical and pumping systems with the assistance of City Staff, Aqua Engineering and Webb Associates. Our team will produce a report that summarizes the findings for each site. The report will be submitted to the City and shall include the overall evaluation of the lift stations along with immediate needs, future needs and operational requirements.~~

Task 3 - Recommended Upgrades, Improvements and Alternatives

Online Meeting

After the City has reviewed the report, we will have our second project meeting where the findings are discussed along with potential remedies and solutions that will kickoff the final task. Our team will present current technologies for communications, hardware, software and plug & play options. We will be prepared to discuss pros, cons and costs of each option as well as have references of other municipalities that have actually implemented that option. Where possible, we will setup nearby site visits where City Staff will be able to see how others are implementing these solutions. Consequently a third workshop will be held to further discuss specifics for each possible solution and to finalize our recommendations. This workshop will be used to also formulate final recommendations for each lift station including recommendations related to equipment, power, instrumentation, communications, process and future considerations. A final project report will then be developed that provides all of the recommendations along with recommended project execution and phasing as well as an associated construction cost estimate.

These will be online interviews of other users

PROJECT APPROACH

Task 3.1 - Recommended Upgrades Implementation | System Integration

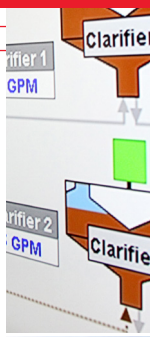
After our team has delivered the project report with recommendations along with phasing requirements and cost estimates, we will assist the City in determining the best course of action to implement the recommendations. We will conduct a final workshop where various implementation options are discussed. One option that SKM has proven to be efficient and cost effective is to have our team perform the system integration for the project under the design and construction management contract. This method eliminates the problems that arise from trying to get a Contractor to program the system exactly how the City envisions it. It allows the integrator to have been in all of the discussions from the inception of the project.

Electrical Instrumentation Controls SCADA

Operator Interfaces	Network Design and Implementation	Radio Communications	Alarm Dialers
Process Diagrams	Drafting	Power Design and Distribution	3D HMI Graphics
Telemetry	Loop Drawings	Electrical Panels Design	System Integration
Control System Master Planning and Design	PLC Programming	HMI Programming	Instrumentation
Facility Maintenance & On-Call Service	Motor Controls	Communications Monitoring	Security Systems

SECTION 4 - FIRM PROFILE

FIRM PROFILE



SKM Engineering LLC (SKM) was founded on the principle of providing sound and proven electrical, instrumentation and control (EI&C) engineering, along with dependable and prompt service at the best value. The SKM team possesses the knowledge, training, and hands-on experience required to meet EI&C needs for your facilities. We possess a unique and fresh perspective and are recognized by our clients for our ability to solve challenging technical problems quickly with simple and cost effective solutions.

History

Established in 1989, SKM began providing these services primarily for power plants and oil refineries in the Rocky Mountain area. In the early 90s, we expanded our services to include water and wastewater facilities. In 1999 we began providing services to Aqua Engineering and permanently established our offices in Bountiful, Utah. Since then, we have provided our services to many other engineering firms and clients. We have had great success in the water/ wastewater industry which now constitutes approximately 80% of our work. SKM now provides services for over 100 clients throughout the United States and Canada.

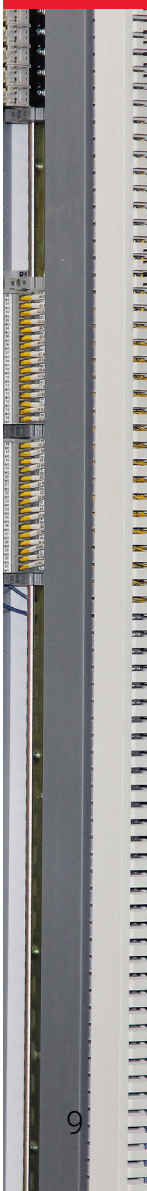
We have progressively built a well-rounded staff of engineers, designers, programmers, and field technicians who together are capable of providing a complete solution from design to integration to maintenance. We currently employ 23 full-time employees and two contract employees. About forty percent of our workload is providing EI&C design/engineering services. Forty percent of our workload is providing EI&C systems integration/ programming services and 20% is providing maintenance and on-call support for existing EI&C systems.

Dedicated to Client Service

With our extensive experience and expertise in PLC Programming and SCADA system engineering, SKM is prepared to meet the City of Beaumont's electrical engineering needs. SKM employs a staff of highly trained and experienced electrical and control engineers with experience in electrical design, instrumentation and controls as well as technical expertise in PLC programming, HMI programming, design and implementation of SCADA/Telemetry systems and a variety of operator interfaces. SKM has developed a reputation of excellent customer service, resourcefulness, and sound engineering while servicing clients primarily in Utah, Nevada, Arizona, Idaho, California, Colorado, Wyoming and New Mexico. We believe in providing the client with the most innovative and cost-effective solutions for their system in order to optimize the process and maximize operator effectiveness. Our exclusive focus on wastewater and water systems provides clients with extensive process knowledge and understanding. We are dedicated to listening to our clients and working together we evaluate and select innovative and effective solutions.

Quality Control

SKM's program to produce a quality project includes client progress meetings to achieve consensus and avoid surprises. It also includes regular independent reviews by a senior engineer not associated with the project. The project manager is responsible for the quality of the deliverables. They oversee project schedules, project scope and budget, review the project regularly and monitor quality control procedures. Reviews are performed by the project manager to insure the work effort is appropriate and technically sound and meets requirements.



AREAS OF EXPERTISE

PLC Programming

Our expertise includes programming of various manufacturers and models of PLCs. We have a sound understanding of how PLCs function and how to maximize their performance as well as the best methods of accessing data to/from operator interfaces and HMIs. We hold integrator service agreements and are particularly are experienced with the following PLC families:

Allen-Bradley — GE — Modicon — Control Microsystems — Automation Direct — Siemens

HMI Programming

With a Variety of HMIs on the market, our expertise is with multiple HMI software packages. Each of these packages has distinct strengths and weaknesses applicable to larger control systems. We stress the importance of making the HMI simple for operators to use and visually obvious so learning new functionalities is quick for every operator, regardless of computer abilities. We are fully capable of implementing the following HMIs:

Proficy iFix — Proficy iHistorian — ClearSCADA — Wonderware — Allen-Bradley FactoryTalk View — Ignition Inductive Automation

Operators Interfaces

Operator interfaces play a key role in the local operation of water and wastewater systems. Operator interfaces enable operators to see data that is displayed on the SCADA at the local pump house. We have used and installed a variety of operator interfaces, including color and monochrome touch screens, text panels, and set point panels. We have installed from the following manufacturers:

Allen-Bradley — Modicon — Siemens — AutomationDirect — Red Lion — GE

Network Design and Implementation

Complex SCADA systems require the design of complex networks for communications. These networks are the backbone for the SCADA system, and reliability is always the key concern. We have designed many of these networks using the following:

Fiber Optics — Ethernet — RS-232 & 485 — Manufacturer Protocols (Like Modbus Plus)

Radio Communications

Wireless capabilities in the past decade have improved dramatically and are easily implemented into SCADA systems. We have used licensed and unlicensed radios to acquire data from remote locations, depending on distances and line-of-sight restraints. We understand the benefits and limitations of wireless communications and are capable of making reasonable recommendations. We have installed radios from the following manufacturers:

Microwave Data Systems (MDS) — Trio — Freewave — Radwin — Cambium — Ubiquiti

AREAS OF EXPERTISE

Electrical Panels Design

We have the capability of designing SCADA control panels as well as motor control panels with integrated PLCs. We use local panel shops and competitively bid out the panels to provide the client with the best possible price.

Alarm Dialers

Dialers have become an important part of SCADA systems with the recent homeland security policies. We include security features and alarming on failure of the SCADA system. These features coupled with traditional alarming make the control system function independently of external alarm systems.

Ignition — Win911 — Sensaphone — Raco

Drafting

We have a staff of CAD designers who have aided in the design of many control systems. They have experience with process and instrumentation diagrams, control diagrams, onelines, control panel design, and all associated power and control diagrams.

Instrumentation

We can recommend the selection of key instruments and manufacturers for a control system. We have installed, calibrated, and troubleshot many instruments a variety of systems. Below is a partial list of instruments we have experience with:

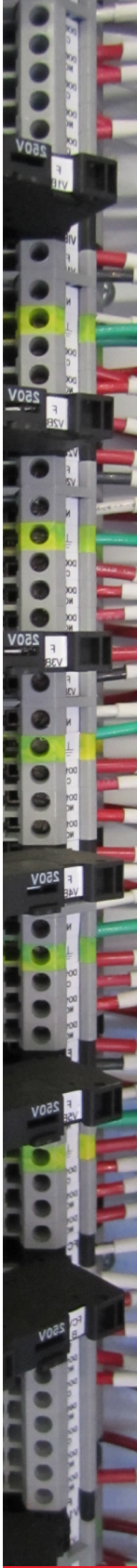
Flow Meters — Level Sensors — Pressure Sensors — Temperature Sensors — Chlorination & De-Chlorination — Water Quality Analyzers

Power Design and Distribution

SKM is capable of full power distribution and motor control design, including variable frequency drives, reduced voltage soft starts, motor starters, transformers, standby generators and more.

3D HMI Graphics

We offer the option of using unique three-dimensional graphics for your HMI. This makes the operator experience much more dynamic and user-friendly than typical two-dimensional graphics. By converting your facility to 3D, you can visualize each room in each building as it exists. The 3D look is clean, accurate, cost effective and produced as quickly as 2D interfaces.



SECTION 5 - KEY PERSONNEL & BIO’S

KEY STAFF QUALIFICATIONS

Mark Jeppsen, P.E. — Principal | Project Manager

Mr. Jeppsen has experience as an electrical, instrumentation and controls engineer in power design, controls engineering, process and instrumentation design, construction oversight, radio and telemetry systems, SCADA system design and integration and PLC and HMI design and integration for multiple wastewater collection and treatment systems. He is responsible for project development, management, schedule coordination and completion. He has worked as electrical design engineer and/or project manager for projects ranging from $10,000 to over $100 million.

Education:

BS Electrical Engineering
University of Utah, 2002

Professional Engineer:

UT, CA, NM, ID

L. Allen Rogers, P.E. — Principal

Mr. Rogers is an engineer and designer with experience in electrical design, control systems,andTelemetryandSCADAsystems.Hehasassistedinthedesign,programming, startup and maintenance on several source water, water treatment, wastewater collection, and wastewater treatment projects. He has worked with many different programmable logic controllers including Allen Bradley, Control Microsystems, and Modicon. He has used many different operator interfaces including Allen Bradley, C-More, and Maple. He has experience with GE Fanuc iFix (Intellution) HMI software. He has assisted in the design and installation of new systems, replacement of old systems, and expansion of existing systems.

Education:

BS Electrical Engineering
University of Utah, 2010

Professional Engineer:

UT

Ryan Pack, P.E. — Principal

Mr. Pack is an electrical and controls engineer with 20 years of experience in design, construction oversight, control systems, telemetry and SCADA systems. His experience includes source water, pressure systems, water treatment, industrial and waste water facilities. He has worked with OEMs developing their standard control systems and has aided in implementation in hundreds of facilities across the western hemisphere. Ryan has experience working with National and International clients specializing in aeration system controls. He is responsible for project development, management, schedule coordination and completion. He has managed design and control projects.

Education:

BS Electrical Engineering
University of Utah, 2002
MBA
Weber State University, 2005

Professional Engineer:

UT, NV, ID, WY, CO, HI, NM

Mark Taylor — Principal

Mr. Taylor is a programmer and field technician with experience in control systems design and integration, as well as control systems maintenance and support. His experience includes source water, irrigation, water treatment, wastewater collection, and wastewater treatment. In each of these areas, he has been responsible for SCADA system programming, implementation, commissioning, and maintenance. Mr. Taylor has also been responsible for operator coordination and training for many of these projects. He has designed and installed new systems, replaced old systems, and expanded existing control systems. Mr. Taylor has worked with communications systems including radio, fiberoptic, ethernet, serial, and proprietary communications systems such as controlnet.

Education:

B.S. Electronics Engineering Technology
Weber State University, 2002

KEY STAFF QUALIFICATIONS

Tovey Ashby — Senior Programmer

Mr. Ashby is a senior programmer with experience in control system design, integration, and support. His experience includes source water, irrigation, water treatment, wastewater collection, and wastewater treatment. He has been responsible for the SCADA system programming, implementation, commissioning, and maintenance. Mr. Ashby has also been on the forefront of developing programming standards implemented across SKM to help streamline project development and reduce programming bugs. This includes custom function blocks for repeatable code used in many systems and templates for HMI/SCADA systems software.

Education:

A.S. Electrical Automation and Robotics Technology, Utah Valley University, 2004
B.S. Technology Management, Utah Valley University, 2006

Justin Fryar — Controls Engineer

Mr. Fryar has worked in the traffic industry developing traffic control systems for large metropolitan cities. Started working in QA testing the reliability between our software and controller hardware. Eventually moved into software development working closely with team members to maintain legacy products for current customers. Has taken on multiple projects from customer ranging from simple reporting fixes to implementing new reports involving data analysis. Currently creating a new version of Ignition for use on mobile devices enabling customers to see data, statistics, and event control their plants wherever they are. Mr. Fryar's experience in software development and quality assurance gives important insight into how unreliable software can directly affect people's lives. As a result, he spends a lot of effort ensuring proper functionality and accuracy. It is vitally important to have industrial control systems working as they were intended.

Education:

Computer Science, Brigham Young University-Idaho, 2018

Adam Russell — Controls Engineer

Mr. Russell has experience with many different aspects of SCADA systems. Has worked with many programmable logic controllers including Allen Bradley, Control Microsystems, Siemens, AutomationDirect Koyo, and others. Has worked with many operator interfaces including Allen Bradley, Schneider Electric, Siemens, and AutomationDirect. Has extensive experience with Inductive Automation Ignition, and other human machine interfaces including GE Proficy iFix and CLEARScada.

Education:

BS Electronics Engineering Technology,
Weber State University, 2014

Certification:

Inductive Automation Ignition 7.9

Daniel Leavitt — Senior Designer / Drafter / 3D Graphic Artist

Mr. Leavitt is an electrical drafter and 3D graphic artist with experience in electrical design, control systems, process, instrumentation and PLC design. His experience includes water treatment, wastewater collection and wastewater treatment. He has drafted power distribution of 120V and 480V systems, created lighting plans, schematics, conduit development, process and instrumentation diagrams and lighting panel schedules. He has also developed 3D graphics of many different mechanical process areas for controls for the PLC at multiple plants.

Education:

Salt Lake Community College, Architectural Drafting
ITT Technical Institute, AAS, Computer Drafting and Design

KEY STAFF QUALIFICATIONS | SUBCONSULTANTS

Justin Logan, P.E. — AQUA Engineering | Principal

Mr. Logan is a Vice President and Principal at AQUA Engineering. Justin leads AQUA's efforts in water and wastewater treatment. He focuses on treatment facility planning, design and construction projects, with emphasis on providing clients effective and affordable solutions to their individual challenges. Justin has worked on more than 50 treatment facilities, developing his extensive experience with a variety of processes and equipment. His responsibilities include project master planning, facility evaluations, process development, design layout, plant configuration, design efficiency and construction drawing development of water and wastewater treatment facilities.

Education:

B.S. Civil & Environmental Engineering, Brigham Young University, 1998
M.S. Civil & Environmental Engineering, Brigham Young University, 1999

Brian Knoll, P.E. — Webb & Associates | Senior Vice President

Brian Knoll is a Vice President at WEBB specializing in Water Agencies/Special Districts. He has been responsible for the design and direction of capital improvement projects throughout southern California. Brian's expertise lies in planning, design, and construction oversight of water and wastewater facilities. Brian has been involved in numerous large multi-discipline water and wastewater projects including the City of Riverside's 26 MGD expansion of their water quality control plant, the 14 MGD expansion of the Western Riverside Wastewater Treatment Plant, and the 6 MGD expansion of the Calipatria Water Treatment Plant. He has worked extensively with the City of Imperial, Western Municipal Water District, Golden State Water Company, the City of Corona, Crestline Lake Arrowhead Water Agency, Eastern Municipal Water District, the City of Riverside, and WRCRWA. Brian has also worked closely with other engineering partners such as CDM Smith, Black & Veatch, and CH2M Hill. His macro style in water resources leadership coupled with a practical approach, enhances Brian's standing within the firm and the industry.

Education:

MS, Civil Engineering, Brigham Young University
BS, Civil Engineering, Brigham Young University

David Algranti, P.E. — Webb & Associates | Chief Design Engineer

David (Dave) Algranti, Chief Design Engineer at WEBB, has more than 40 years of experience in the planning, design, and construction of water resources projects. With such deep knowledge of water-related systems, he assists as technical advisor for all WEBB teams handling such projects for clients. Dave helped develop WEBB's quality management program, enabling him to coordinate and directly perform project quality control and assurance - making sure project technical issues are recognized early and resolved efficiently by an expert in the firm.

Education:

BS, Civil Engineering, California Polytechnic University, Pomona

SECTION 6 - REFERENCES

REFERENCES

The highest compliment a company can receive is a referral from a respected client. We appreciate and recognize our client relationships and are grateful for their confidence in us.

Dean Standing Warrior
Western Municipal Water District
16451 El Sobrante Road
Riverside, CA 92503
951-789-5113

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Jamey West,
Project Manager
Salt Lake City WRF
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Salt Lake City, UT 84116
(801) 799-4083

Doug Evans
Engineering Manager
Mountain Regional Water
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(435) 940-1916

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Spanish Fork City
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(801) 804-4466

Jeff Hiatt, Superintendant
Payson City
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Payson, UT 84651
(801) 465-5277

David Richards,
Superintendant
Idaho Falls Water Department P.O. Box 50220
Idaho Falls, ID 83405
(208) 612-8472

Mark Slagowski,
Superintendant
Bountiful City Water Department 245 West 1050 South
Bountiful, UT 84010
(801) 298-6180

Mike Gill, BCWTP Lead Plant Operator
Salt Lake City Dept of Public Utilities
1350 W. Temple
Salt Lake City, UT 84115
(801)582-2816

Joel Kertamus,
Public Works
Grantsville City
429 E. Main
Grantsville, UT 84029
(435) 884-3411

SECTION 7 - SCOPE OF SERVICES

SCOPE OF SERVICES

We have developed this scope and the attached fee proposal based upon the following assumptions.

- ✓ If our team is selected, we will together with the City fine tune this scope of services and fee proposal after further discussions and negotiation.
- ✓ This project is focused primarily on electrical, instrumentation and controls. While we will be providing some high level recommendations, we have not included time and effort for complete master planning at each lift station. It is assumed that this will be handled by a separate project.
- ✓ The scope of services has been developed based upon the 10 lift stations listed in the RFP. The City will provide all available as-builts, drawings and documents for the lift stations to aid our team in the evaluation of each station.
- ✓ The City will escort our team members to each lift station on an as needed basis throughout the project. Our team will coordinate with City Staff in advance for each visit.
- ✓ Our work will include four formal meetings and additional informal meetings as required.

The following scope of services has been divided into three tasks as outlined in the RFP.

Task 1 - Project Management SKM will develop an internal Project Management Plan (PMP) to guide the project team through its work. The PMP will identify format and schedules for technical workshops, progress meetings, project deliverables, and quality control. It will also outline team responsibilities, project communications, Quality Management procedures, budget tracking, project schedule, and accountability reporting.

Task 2 - Data Collection and Assessment of Existing Lift Stations Members of our team will gather information about each lift station by obtaining record documents, interviewing City Staff and by visiting each station. We will also look at historical data that has been collected by the SCADA systems over the years. We will document the electrical, instrumentation and controls components currently in use and evaluate their current condition. We will determine if hydrogen sulfide has been present and document the extent of corrosion that has occurred at each station. ~~We will identify how each station is operated, what redundancies are in place, what deficiencies may exist, and overall station capacity versus actual flows.~~ To conclude this task, a report will be produced that describes our findings which will be submitted to the City for review. A formal meeting will be conducted shortly thereafter to discuss our findings and launch into the next task.

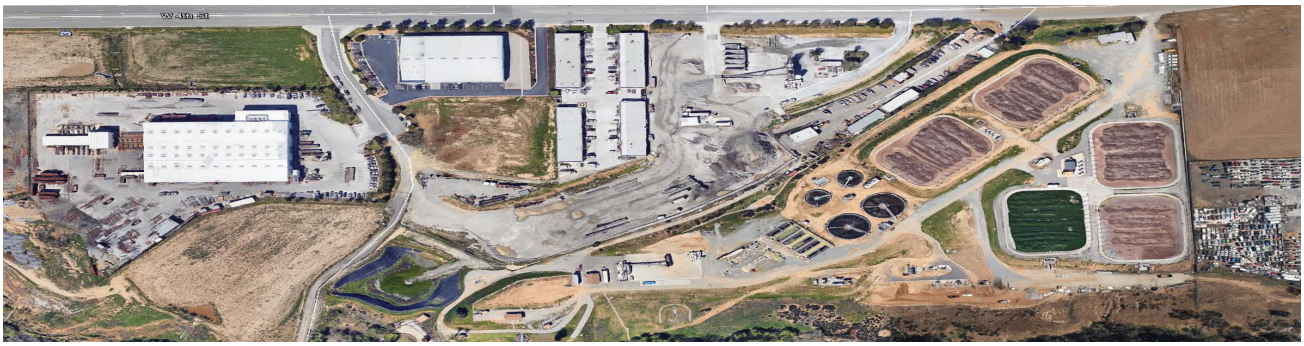
Task 3 - Recommended Upgrades, Improvements and Alternatives Based upon the findings from Task 2, our team will begin to develop recommendations for improvements that should be made at each lift station. We will present to the City options based upon current technologies for communications, hardware and software. Options will include the traditional PLC type solution as well as off-the-shelf plug-and-play solutions. Pros and cons for each solution will be presented along with a cost-benefit analysis. Together with the City we will narrow down the selection to several options and then further evaluate those options. We will obtain references from other municipalities who are implementing the selected options. If possible we will visit nearby facilities and interview operators using these options. A workshop will then be held to finalize our recommendations that will then be documented into a final report. The report shall include recommended project phasing and a construction cost estimate. A final workshop will be held with the City to conclude the work. In this workshop we will discuss the City's options for implementing the recommendations that have been made.

These will be online interviews of other users

SECTION 8 - COST (SEPARATE ENVELOPE)

SECTION 9 - RELATED PROJECT EXPERIENCE

WORK EXPERIENCE



Beaumont Treatment Plant Expansion & Salt Mitigation

The team of Webb, Aqua and SKM recently designed and is currently participating in the construction of the City of Beaumont's Wastewater Treatment Plant Expansion and Salt Mitigation Project. The existing facility had become antiquated, unreliable and had no means of removing brine. Brine disposal was an integral part of this project and a key driver in the selection of the new process. Without a safe, reliable, and cost effective way to dispose of the brine, this project could not move forward and compliance with the Basin Plan would be impossible. The brine pipeline connecting to the Inland Empire Brine Line (IEBL) was determined to be the best option during the feasibility study, due to cost and certainty of operation. The brine line has been sized at 12-inches and will be approximately 23-miles long. The pipeline begins at the City's WWTP and ends near the City of San Bernardino's WWTP on Waterman Avenue.

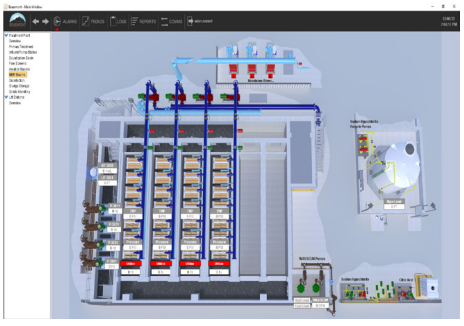
The work consists of a first phase which includes improvements at the headworks, influent pump station, new fine screens, a new aeration basin and a new MBR process. Following the completion of the first phase a second and final phase will add raw water equalization and solids handling which includes two centrifuges.

Details

Owner: City of Beaumont
Reference: Thaxton Van Belle, Plant Manager
Phone 909-496-5689 | TVanBelle@beaumontca.gov
Location: Beaumont, California
Completion: 2019

Features

- ✓ Feasibility Study
- ✓ Brine disposal
- ✓ Design & Construction



WORK EXPERIENCE

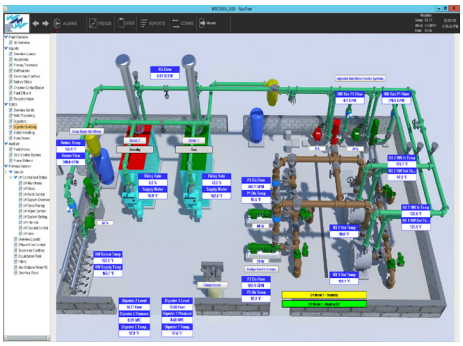
Western Riverside County Regional Wastewater

AQUA Engineering, teamed with Webb and Associates, assisted the Authority with the planning, design, construction, and commissioning of this 14 MGD overall plant upgrade. The solids process included the addition of solids thickening for both primary and secondary solids wasted from the liquid treatment stream. The existing, two (2) aerobic digesters were converted to anaerobic digesters, which included adding lids, jet mixing equipment, gas safety systems, and so forth. In addition, systems were designed and installed to clean and dry the gas for use in the plant's boilers for both heating the digesters and to provide heat to the solar drying facility. The existing dewatering equipment was replaced with three (3) new centrifuges to improve dewatering of the digested solids. The solids were then automatically conveyed and delivered to a solar drying greenhouse, where the solids were further processed to 85% dry. The solar dryer included floor heating to augment the process in cooler or inclement weather periods as well as odor control to mitigate this potential issue. The solids handling process produces a Class A biosolids and reduced the overall solids disposal from the facility by more than 5 times, as they went from hauling about 40 yards of solids per day to about 40 yards per week, saving the Authority over $700,000 per year.

SKM provided electrical, controls and instrumentation design for the second phase of an expansion project bringing the facility from 8 to 14 MGD. The plant will be upgraded and expanded to meet future needs and improve treatment. Improvements include headworks, primary clarification, flow equalization, bio-reactor expansion, secondary clarification, tertiary filtration, chlorination, WAS thickening, conversion to anaerobic digestion, solar drying and odor control. SKM's design efforts included rerouting the utility feed to the facility, modifications and additions to the existing power distribution, network and controls upgrades and efforts to enclose existing outdoor MCC's and control cabinets.

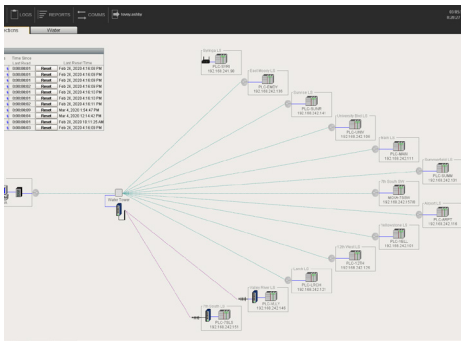
Details

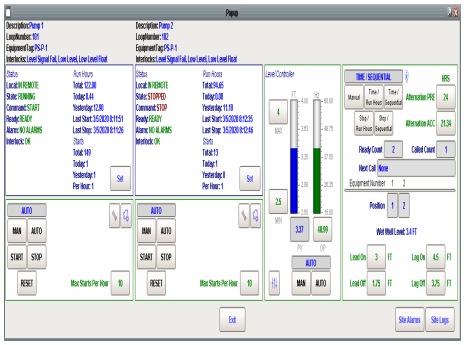
Owner:	Western Riverside County Regional WW
Reference:	Tony Pollack, Wastewater Operations Manager
Phone	951-789-5114
Location:	Riverside, California
Completion:	2019



WORK EXPERIENCE

City of Rexburg, Wastewater Collection SCADA System





In Rexburg, SKM cutover 13 lift stations. SKM used hybrid radio system of 5.8 GHz, 900 MHz and cellular to hit all 13 locations. As part of the project an emergency back-up float system was installed with the PLC for redundancy of pump control. Part of the float system a separate intrinsic barrier box was installed to meet code requirements. Downtime of the lift stations was minimized as much as possible by ensuring all work that could be done with lift stations operational was completed prior to working inside the pump control panels. That work included all physical installation of any needed conduit, panels, radios and landing all terminations in the PLC panels Downtime was coordinated carefully with the City and a plan put in place for each lift station that took into account worker safety and the need to prevent any flooding from potential downtime of the stations.

Details

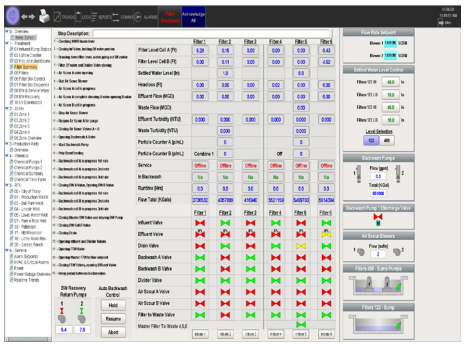
Owner:	City of Rexburg
Reference:	Jared Gunderson, Wastewater Dept.
Phone	208-372-2441 | Cell: 208-716-1323
Email	jared.gunderson@rexburg.org
Type:	SCADA Upgrade, Lift Stations, PLC
Location:	Rexburg, Idaho
Timeline:	Current

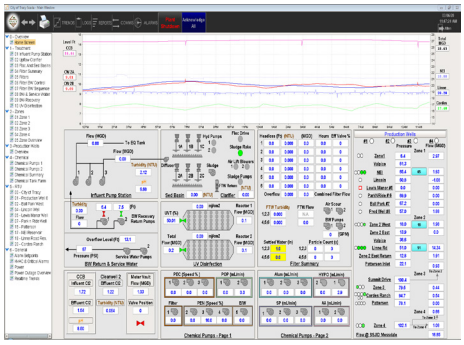
Features

- ✓ Replacement of SCADA System
- ✓ 13 Lift Stations; Minimal Downtime
- ✓ Emergency Back-up Float System

WORK EXPERIENCE

John Jones Water Treatment Plant





The City of Tracy John Jones Water Treatment Plant (WTP) is a 30 mgd capacity surface water treatment plant. The existing plants SCADA system was out of date and SKM was selected to update the existing Wonderware system with Ignition HMI software. Several older controllers were also replaced to give more visibility to existing hardware. In addition to the plant, 15 remote sites were pulled in the existing SCADA system that included boosters, wells, and major PRVs.

Details

Owner:	City of Tracy, Utilities Dept.
Reference:	Dave Carter, Water Production Supervisor
Phone	209-831-6302 | dave.carter@ci.tracy.ca.us
Type:	SCADA Upgrade
Location:	Tracy, California
Timeline:	Current

Features

- ✓ Replacement of SCADA System
- ✓ SNMP Monitoring of Servers
- ✓ SCADA System Training

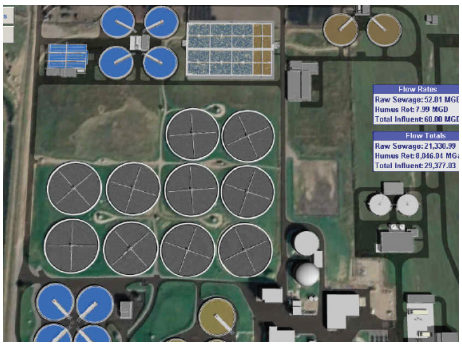
WORK EXPERIENCE

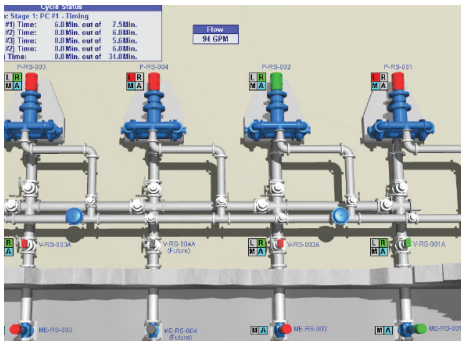
Central Weber Sewer Improvement District

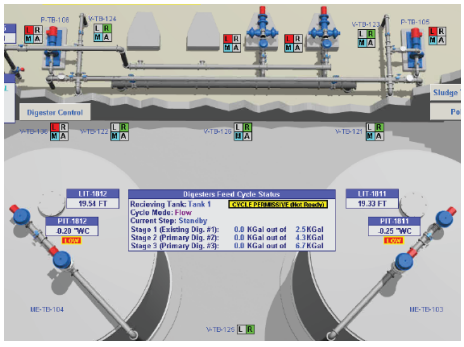
Location: Ogden, UT **Duration**: 2004 - Present
Value: $2.1 M

Wastewater System Integration (2004-2019)
SKM has been the Systems Integrator for Central Weber for the past 10 years. Over those years we have upgraded their antiquated PLC's, upgraded HMI software performed a 60MGD plant expansion and we upgraded their solids handling/dewatering controls. SKM successfully tied the SCADA system to their CMMS software. The SCADA system was setup with a redundant ring style network and we are utlilizing Ignition for launching HMI clients over secure WiFi connections to tablets.

Wastewater Treatment Plant Expansion (2007-2012)
SKM joined with MWH and performed instrumentation and controls engineering for a new activated sludge plant that was constructed adjacent to the existing plant. SKM provided construction management services for the project and is also acting as systems integrator. SKM will provide 19 PLC panels and network cabinets. As the systems integrator, SKM programmed the PLCs and the HMIs throughout the plant and seamlessly integrated the new plant with the existing plant. Along with the process control SKM was also contracted to do the HVAC controls for the new plant expansion. The project included 14 air handling units in eight buildings. Allen-Bradley ControlLogix were used in each building. Several buildings utilized AB Flex remote IO drops for air handling units. Operators were able to use Allen-Bradley OITs at each building to completely control the HVAC system. The HVAC system was also put on their overall SCADA system using the GE iFix platform.







Reference:
Lance Wood, (801) 731-3011,
lwood@centralweber.com

WORK EXPERIENCE

SKM received the Firebrand Award Winner at the 2018 Inductive Automation conference. To learn more about the projects, visit:

"Two Customers See Big Improvements, Can Share Data"

Mountain Regional Water SCADA System Installation

Location: Summit County, UT | **Duration**: Under Service Contract
Reference: Doug Evans | (435) 940-1916 | doug@mtregional.org

In 2012 SKM worked with MRW to come up with criteria to upgrade their existing SCADA system. It was decided to stay with their current hardware platform due to the drastically lower costs of installation. Over the course of two years we installed and upgraded 55 remote sites and one water treatment plant. This was a turn-key proj- ect where we supplied the hardware, installation, programming, and training. A major portion of this project was to implement energy saving programs. Because of changes in logic we were able to adjust the rate structures at several facilities and have since paid for the cost of the SCADA upgrade. Since then we have worked with MRW to implement other cost saving programming such as mass balance work to identify water leaks before they are found by operators.

- ✓ 65,000 tags — 52 devices (40 SCADA Packs, 3 AB Logix PLCs, 9 Mod-bus Ethernet IO Units)
- ✓ Up to 15 clients at a time
- ✓ Redundant Architecture
- ✓ MSSQL DB
- ✓ 4,000 configured alarms
- ✓ 3,000 historicized data points
- ✓ 25 main screens
- ✓ 120 pop-ups

Park City Water — SCADA Upgrade

Location: Park City, UT | **Duration**: Under Service Contract
Reference: Chad Busch | (435) 659-7372 | chad.busch@parkcity.org

Park City was in dire need of upgrading their current control system. They were operating on three separate control systems across their water department and were using antiquated equipment that wasn't supplying the City with their control and data acquisition needs. SKM teamed with Carollo Engineers to design a new system and with a design build approach implemented a state of the art control system. The overall integration included 70 remote sites and two full water treatment plants. Ignition software, Allen-Bradley hardware, a Cisco network, and a Radwin radio system were used at the city to complete the approach. The construction took place during a six-month period where sites were slowly transitioned over to the new system. This was done without causing downtime and operational stress to the city so that they could continue to operate reliably through their high demand season.

- ✓ 135,000 tags — 103 devices (60 radios, 37 AB Logix Series PLCs, 5 Mod- bus devices)
- ✓ Up to 20 clients at a time
- ✓ Redundant Architecture with fallback
- ✓ MSSQL Cluster DB
- ✓ 6,000 configured alarms
- ✓ 5,000 historicized tags
- ✓ 35 main screens
- ✓ 150 pop-ups

WORK EXPERIENCE

Snyderville Basin

Location: Park City, UT | **Duration**: Under Service Contract

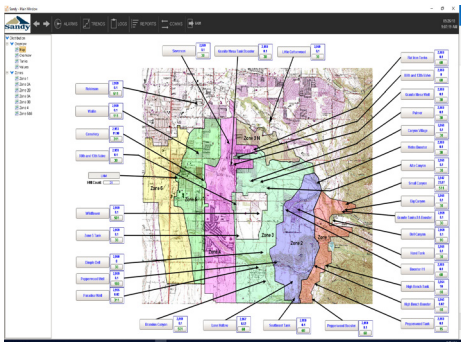
The Snyderville Basin Water Reclamation District (SBWRD) provides wastewater treatment for Park City, UT. Their system consists of two water reclamation facilities and 10 lift stations. SKM began providing services to SBWRD in 2008 by providing on-call services and support for their SCADA system. In 2012 we provided the system integration for their East Canyon plant expansion. Similarly, in 2018 we did the same for the Silver Creek plant. In 2019 we replaced the collections system monitoring and controls with a cellular based system utilizing Ignition Edge.

Reference:
Chad Burrell | (435) 649-7993

Sandy City Electrical & Controls

Location: Sandy City, UT | **Duration**: Under Service Contract

SKM is currently under maintenance contract with Sandy City Water and has been providing maintenance services since 2004. With an antiquated tome telemetry system, the City of Sandy put out requests for a new SCADA system utilizing radio technology. 39 sites were integrated into the new SCADA system using Allen-Bradley PLCs, MDS licensed and unlicensed radios, and Intellution iFIX and iHistorian as an HMI. SKM provided the complete and operational SCADA System for Sandy City's Water System that was completed in 2005. Since then, SKM has provided incremental additions, improvements and maintenance including a new storm water system. The system consists of nearly 40 remote sites that consist of tanks, boosters and wells. In 2016 SKM provided an HMI system upgrade for the water and storm water systems.



Reference:
Mike Campbell | (801) 509-1056

WORK EXPERIENCE | Select Project Experience

	Contract Duration	Planning & Programming	Integration	Software Application	Hardware Manufacturing	Training	Startup & Commissioning	Turn-Key Project	Consultant	Implementation	System Wide
Idaho Falls Water System Expansion Idaho Falls, ID	Current	√	√	√	√	√	√	√	√	√	√
Salt Lake City SCADA Consulting Services Salt Lake City, UT	Current	√	√			√	√	√	√	√	
Salt Lake City Big Cottonwood SCADA Upgrade Salt Lake City, UT	2018	√	√			√	√	√	√	√	
Snyderville Basin East Canyon Water Reclamation Facility Summit County	2017	√	√			√	√	√	√	√	
Ogden City Water System SCADA Upgrade Ogden, UT	2016-2017	√	√	√	√	√	√		√	√	
Sandy City SCADA Upgrade Sandy, UT	2016	√	√	√		√	√	√	√	√	√
Park City Water SCADA Upgrade | Park City, UT	2015-2016	√	√	√	√	√	√	√	√	√	√
Idaho Falls Water System SCADA Upgrade Idaho Falls, ID	2015-2016	√	√	√	√	√	√	√	√	√	√
Salt Lake City WRF SCADA Upgrade Salt Lake City, Utah	2013-2015	√	√			√	√		√	√	
Mountain Regional Water SSD SCADA System Installation Park City, Utah	2013-2015	√	√	√	√	√	√	√	√	√	√
Quinn's Junction Park City, Utah	2013		√	√		√	√			√	
Central Weber SID WWTP Expansion Ogden, Utah	2007-2012	√	√	√		√	√		√	√	√

APPENDIX A — KEY EMPLOYEE RESUMES

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Mark P. Jeppsen, P.E. - Principal

(801) 694-4529 - mark.jeppsen@skmeng.com

Mr. Jeppsen is an electrical, instrumentation and controls engineer with 19 years of experience in power design, controls engineering, process and instrumentation design, industrial network design, construction oversight, radio and telemetry systems, SCADA system design and integration and PLC and HMI design and integration. He has designed and integrated multiple potable water, secondary water, water treatment, wastewater collection and wastewater treatment systems. Design tasks include facility power, motor power and control, SCADA systems, instrumentation selection and control, process and instrumentation diagrams, communications networks and systems, control loop diagrams and descriptions. Integration tasks include control and PLC panel design and construction, PLC, OIT and HMI programming and commissioning, radio system integration and testing, instrument calibration, automated reporting systems and operator training and documentation.

Project Role

Electrical & Controls Engineer

Work Experience

21 Years

Education

BS Electrical Engineering
University of Utah, 2002

Registration

Professional Engineer:

Utah

Licenses

Licensed P.E.

Utah

Specialties

- Radio and Telemetry Systems
- Construction Oversight
- PLC & HMI Design & Integration
- Industrial Network Design
- Controls Engineering
- Power Design
- Process & Instrumentation
- Design
- SCADA System Design & Integration

Project Experience

2004 – Present:
Central Weber Sewer Improvement District, UT - Electrical and Controls Engineer
SKM has been working for Central Weber Sewer Improvement District (CWSID) since 2004 by providing electrical designs, controls upgrades and system maintenance. Mark has managed upgrades at the plant as they have come, including upgrades for the influent pump building, utility water pump building and PLC & HMI upgrades. In 2006 design began for a complete 60 MGD plant expansion and SKM was an integral part of the design and integration team. Construction for this project began in 2008 and was completed in 2012.

2006 – Present:
Salt Lake City, UT - Electrical and Controls Engineer
SKM has been providing services to Salt Lake City for their various water and wastewater facilities since 2006. Mark is currently overseeing the implementation of a complete control system upgrade at the 50 MGD Water Reclamation Facility which includes control panel upgrades, PLC replacements and new HMI screens. SKM has designed a new WAS thickening facility and is currently designing a new Headworks facility. Mark is the lead engineer and project manager for electrical and controls upgrades at the 20 MGD Big Cottonwood Water Treatment Plant that will be completed in 2018.

2003 – Present:
Park City, UT - Electrical and Controls Engineer
SKM began working for Park City by providing the system integration for an iron, arsenic and manganese removal process at the Spiro Water Treatment Plant in 2003. In 2012, SKM provided the complete and operational SCADA System for the Quinn's Junction Water Treatment Plant, a microfiltration membrane process. This included PLC & HMI programming, custom reports and historical data gathering and startup and commissioning. In 2016 SKM upgraded Park City's complete SCADA system which included their two water treatment plants and approximately 70 remote boosters, tanks, metering stations, PRV stations and well houses.

1998 – Present:
West Wendover, NV - Electrical and Controls Engineer
Since 1998 SKM has been providing services to the City of West Wendover for their water and wastewater systems. In 1999-2000 SKM performed a SCADA System replacement for both systems that incorporated new radios and equipment for their well field and pipeline located 20 miles from the City. In 2011-2012 SKM provided the design engineering and integration for a new MBR facility at the Water Reclamation Facility.

2004 – Present:
Sandy City, UT - Electrical and Controls Engineer
SKM provided the complete and operational SCADA System for Sandy City's Water System that was completed in 2005. Since then, SKM has provided incremental additions, improvements and maintenance including a new storm water system. The system consists of nearly 40 remote sites that consist of tanks, boosters and wells. In 2016 SKM provided an HMI system upgrade for the water and storm water systems.

2003 – Present:
City of Tooele, UT - Electrical and Controls Engineer
Mark began working for the City of Tooele by providing electrical and controls maintenance at the City's Water Reclamation Facility. In 2011 Mark was the lead electrical engineer for the design, construction and integration of a plant expansion at the Water Reclamation Facility. In 2015 SKM began providing electrical and controls services for the City's culinary water system.

Mark P. Jeppsen, P.E. - Principal

Project Experience (continued)

1999 – Present:
Springville City, UT - Electrical and Controls Engineer
Mark successfully designed and implemented the electrical and controls for two plant expansions at the Springville Wastewater Treatment Plant. The first expansion was in 1999 and the second in 2009. The expansions consisted of a new electrical service, new SCADA system and PLC replacements. SKM has been providing integration and maintenance services to the City since 1999.

1999 – Present:
Spanish Fork City, UT - Electrical and Controls Engineer
In 1999 SKM began working for Spanish Fork City by upgrading the electrical and controls system for their primary pump station at the Wastewater Treatment Plant. In 2004, the plant was expanded and Mark was the lead electrical and controls engineer for the project. He successfully implemented the electrical design for the project, oversaw the construction, and integrated the control system. A new fiber optic network was successfully installed and improved the operation and reliability of the SCADA system.

2002 – Present:
City of Payson, UT - Electrical and Controls Engineer
The Payson Wastewater Treatment Plant was upgraded in 2002. Mark successfully implemented the electrical design for the project, oversaw the construction, and integrated the control system. A new fiber optic network was successfully installed and improved the operation and reliability of the SCADA system.

Other Project Experience

Present: Beaumont City, CA. WWTP MBR and RO Expansion
Present: Las Gallinas, CA. WWTP Expansion
Present: City of Imperial, CA. WWTP MBR Facility Expansion
Present: WRCRWA, Riverside, CA. WWTP Expansion
Present: Central Davis Sewer District, Kaysville, UT. WAS Thickening Addition
2016: Ogden City, UT. Water System SCADA Upgrade
2016: Provo City, UT. WWTP UV Building Addition and Headworks Upgrade
2015: Ogden City, UT. WTP Microfiltration Upgrade
2015: Provo City, UT. WWTP Master Plan
2014: Imperial, CA. WTP Controls Upgrade
2013: City of Elko, NV. WWTP Upgrade
2013: Fort Shafter Flats, HI. WWTP MBR Facility
2011: Las Gallinas, CA. WWTP Microfiltration Addition
2011: Provo City, UT. WWTP Centrifuge Facility Upgrade
2011: Orem City, UT. WWTP Expansion
2010: Taos, NM: WWTP MBR Facility Expansion
2010: Moroni, NM: WWTP MBR Facility
2009: Brigham City, UT. WWTP Expansion
2008: Heber, CA. WWTP Expansion
2008: Inscription Canyon Ranch, AZ. WWTP MBR Plant
2008: Edgewood City, NM. WWTP MBR Facility
2007: Gallup, NM. WWTP Expansion
2006: Jerome City, ID. WWTP MBR Facility
2005: Hyrum City, UT. WWTP MBR Facility
2003: Oakley City, UT. WWTP MBR Facility
2002 – Present: Central Davis Sewer District, Kaysville, UT. WWTP Upgrades

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L. Allen Rogers, P.E. - Principal

(801) 497-6847 - allen.rogers@skmeng.com

Mr. Rogers is a programmer and designer with experience in electrical design, control systems, and Telemetry and SCADA systems. Mr. Rogers has assisted in the design, programming, startup and maintenance on several source water, water treatment, wastewater collection, and wastewater treatment projects. Mr. Rogers has experience with many different aspects of SCADA systems. He has worked with many different programmable logic controllers including Allen Bradley, Control Microsystems, and Modicon. He has used many different operator interfaces including Allen Bradley, C-More, and Maple. He has experience with GE Fanuc iFix (Intellution) HMI software. He has assisted in the design and installation of new systems, replacement of old systems, and expansion of existing systems. Mr. Rogers has worked with several different communication systems including radio, Ethernet, serial, and proprietary communication systems. Mr. Rogers has also assisted in several path studies using licensed and unlicensed radios.

Work Experience

10 Years

Education

BS Electrical Engineering
University of Utah, 2010

Registration

Professional Engineer:

Utah

Specialties

- Programming
- Project Management
- Design
- Electrical Design, Control
- Systems, Telemetry and SCADA
- systems
- Programmable Logic Controllers
- HMI
- Radios

Project Experience

Gallup Water SCADA Replacement, Gallup, NM: Programmer
Mr. Rogers assisted in the programming of the HMI and PLCs of the city's SCADA system. The project replaced over twenty remote sites during an installation time of two weeks.

Gallup Wastewater Expansion, Gallup, NM: Programmer
Mr. Rogers assisted in the programming of plant PLCs and the creation of loop diagrams for additions to the wastewater plant.

Lost Creek and Rockport Boosters, Summit County, UT Programmer
Mr. Rogers programmed the PLCs, operator interfaces, and HMI for the Lost Creek Booster expansion and the Rockport Booster stations. The main pump station had 10 pumps running at 500 PSI.

Mountain Regional Water, Summit County, UT Programmer/Project Manager
The system includes 40 remote sites, a treatment plant, and large booster pump system. Mr. Rogers is currently involved in setting up new radio networks and upgrading hardware and HMI software for the system.

Elko WWTP Upgrade, Elko, NV. Designer
Mr. Rogers assisted in the electrical design, load calculations, conduit schedules, and lighting plan for the Elko WWTP Headworks expansion project.

Elko WWTP Reporting, Elko, NV. Programmer
Mr. Rogers was responsible for the design and programming of a complete reporting package that integrated all reporting aspects of the plant from the lab, operator field readings, and HMI historical data into one database. Reports were then automatically generated from information contained in the database.

CWSID WWTP Upgrade, Ogden, Ut. Designer
Mr. Rogers assisted in the design of the control system of the Central Weber Sewer Improvement District WWTP 60 MGD upgrade. He was responsible for developing many control loop specifications and aided in the creation of the process and instrumentation diagrams.

Intrepid Potash, Carlsbad, NM. Programmer
Mr. Rogers was responsible for a large portion of the programming of an underground stacker/reclaimer system that involved a stacker, several conveyer belt systems, and a loading system.

Quinns Junction WTP, Park City, UT. Project Manager
Mr. Rogers was in charge of the integration of the Quinn's plant which included programming the plant PLC, HMI Software, and reporting for the plant. Mr. Rogers's was also responsible for integrating the OEM Pall system into the plant HMI to create a seamless operating experience for the plant staff.

Salt Lake City WRF, Salt Lake City, UT. Project Manager
Mr. Rogers just completed a network upgrade at the plant that installed a new fiber backbone throughout the plant and new CTC cabinets using Layer 2 and 3 Cisco switches in nineteen locations. Mr. Rogers is currently designing the replacement of the antiquated remote IO system throughout the plant with new PLCs.

Las Gallinas Re-use Water Project, San Rafael, CA. Project Manager
Mr. Rogers led the design team for the closed filter re-use water project in Las Gallinas. The system consisted of treating effluent with a GE Zpak system for irrigation use. Mr. Rogers recently finished construction oversight on the electrical portion of the project.

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Ryan Pack, P.E. - Principal

(801) 599-4628 - ryan.pack@skmeng.com

Mr. Pack has experience with many components of SCADA and controls. He has worked with controls as simple as relay logic and PID loop controllers thru complex radio controlled SCADA systems. He has worked with many different programmable logic controllers and Operator interfaces including Allen Bradley, Control Mi¬crosystems, GE, Koyo, Modicon, Siemens, and others. He has utilized many software packages for human ma¬chine interface including Allen Bradley, GE Proficy (Intellution), Wonderware, and National Instruments Lookout. He has designed and installed new systems, replaced old systems, and expanded existing control systems. Mr. Pack has worked with many communications systems including radio, fiberoptics, ethernet, serial, and propri¬etary communications systems such as controlnet and profibus. He has conducted numerous path studies, for both licensed and non-licensed radio communications systems. He has designed and installed radio telemetry systems with over 50 remote sites.

Work Experience

20 Years

Education

BS Electrical Engineering
University of Utah, 2002

MBA
Weber State University, 2005

Registration

Professional Engineer:

UT, ID, NV, WY, CO, HI, NM

Specialties

- Electrical and Controls
- Design
- Construction Oversight
- Control Systems
- Telemetry and SCADA Systems
- Design
- Control Testing
- Programming
- Startup and Maintenance Contracts

Project Experience

Lost Creek Project, Summit County, UT. Electrical/Controls Engineer
Mr. Pack worked on this project in all as¬pects from the shallow wells to the treatment facility. Ryan designed Mountain Regional Water's SCADA system, and has continued working on the system since original installation. He oversaw the programming and startup of the existing Lost Creek Canyon control system, and is extremely familiar with its layout, configuration, and appli¬cations. Ryan also worked on the design for the motor controls, power distribution, lighting, and instrumentation for this system.

Mountain Regional Water SCADA, Summit County, UT. Controls Engineer
SKM designed a new SCADA system for the district that included all of the water distribution, raw water collection, and treatment. He worked with thewater district to designed a new SCADA system that included all of the water distribution, raw water collection, and treatment. He worked with the water district to meet their monitoring, reporting, and control needs. Ryan coordinated the installation with their staff, and programmed much of the system. This included reporting, moni¬toring, alarming, and full control of the system. He continues to maintain the system with SKM's staff of service personnel.

Idaho Falls Water SCADA, Idaho Falls, ID. Controls Engineer
SKM designed a backup power generation system for the water department, as well as the control interface between the Generator and the SCADA system. Mr. Pack is currently maintaining their water system SCADA and controls, and is under contract to perform program¬ming on their upcoming additions.

Santaquin SCADA, Santaquin, UT. Controls Engineer
SKM designed a new SCADA system for the city that included all of the water distribution, wastewater collection, and wastewater treatment facility. Mr. Pack worked with the city to meet their monitoring and control needs, and provide a system that would work for them. He co¬ordinated the installation with local trades, and aided in the programming of the system. This included reporting, monitoring, alarming, and full system control.

Summit Park Boosters, Summit County, UT. Electrical/Controls Engineer
SKM worked on the electrical and controls design for the two pump stations, and flow control station required for this project. Mr. Pack designed the motor controls, instrumentation, and controls required to operate the facilities as required by Mountain Regional Water.

Bountiful City Water, Bountiful, UT. Electrical/Controls Engineer
SKM has worked on numerous projects for the City of Bountiful. Mr. Pack has designed numerous motor control and distribution systems for wells and boost¬ers for the city. He has worked with the department head to incorporate complete system control from the motor control enclosure for each of these sites.

Davis and Weber Counties Canal SCADA, Weber County, UT. Controls Engineer
SKM is currently working on installation of a new SCADA monitoring system for the canal company. This includes the monitoring of all canal discharge flows, as well as monitoring of the primary canal flow. Ryan designed the radio network, control sys¬tem, and aided the district in coordinating installation of required hardware.
East Zion SCADA, East Zion SSD, UT. Electrical/Controls Engineer.
Ryan Designed the Electrical, Controls, and SCADA system for this community's water system. This included phase conversion for the booster pumps, tank level monitoring, well control and communications between the sites. Ryan designed all of the motor controls and instrumentation for this project.

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Mark Taylor, E.I.T. - Programmer & Field Technician

(801) 694-2599 - mark.taylor@skmeng.com

Mr. Taylor is a programmer and field technician with experience in control systems design and integration, as well as control systems maintenance and support. His experience includes source water, irrigation, water treatment, wastewater collection, and wastewater treatment. In each of these areas, he has been responsible for SCADA system programming, implementation, commissioning, and maintenance. Mr. Taylor has also been responsible for operator coordination and training for many of these projects. He has designed and installed new systems, replaced old systems, and expanded existing control systems. Mr. Taylor has worked with communications systems including radio, fiberoptic, ethernet, serial, and proprietary communications systems such as controlnet. He has conducted numerous path studies, for both licensed and non-licensed radio communications systems. He has installed radio telemetry systems with over 40 remote sites.

Work Experience

15 Years

Education

BS Electronnics Engineering Technology,
Weber State University, 2002

Registration

EIT

Project Experience

Sandy City SCADA, Sandy, UT. Programmer.
Mr. Taylor programmed the PLCs, the HMI computers, and the operator interfaces for the city's entire freshwater system. This included reporting, monitoring, alarming, and full system control. The project involved over 40 remote sites. Mr. Taylor was also responsible for operator training and commissioning. SKM and Mr. Taylor are under contract with Sandy for SCADA system support and expansion.

Toana Vista Golf Course SCADA, West Wendover, NV. Programmer/Field Technician.
Mr. Taylor programmed the PLCs, designed the PLC panels, and programmed the HMI computer. This included reporting, monitoring, alarming, and system control. The project involved interfacing with the existing SCADA system at the wastewater plant to pump water to the golf course for water feature/irrigation purposes.

Magna WWTP SCADA, Magna, UT. Programmer/Field Technician.
Mr. Taylor programmed the PLC and operator interface for part of the plant that was being upgraded, and then did all of the programming involved in upgrading the entire plant's existing HMI. He was also responsible for commissioning and operator training. Mr. Taylor and SKM maintain the plant's SCADA and controls, and are under contract to perform programming on upcoming additions.

Kennecott Daybreak SCADA, South Jordan, UT. Programmer.
Mr. Taylor programmed the HMI computer. This included reporting, monitoring, alarming, and system control. He also picked up where a previous control system integration company had left off, and worked with the system operators to successfully commission the entire automatic control system. Mr. Taylor and SKM are currently under contract with Daybreak to maintain and expand their SCADA system.

Moroni WWTP SCADA, Moroni, UT. Programmer.
Mr. Taylor programmed the PLC and HMI computer for the entire WWTP facility. This included reporting, monitoring, alarming, and system control as well as commissioning and operator training. Mr. Taylor and SKM are currently under contract with Moroni to maintain and expand their SCADA system.

Mountain Regional Water SCADA, Summit County, UT. Programmer.
SKM designed a new SCADA system for the district that included all of the water distribution, raw water collection, and treatment. Mark assists in maintaining the system.

Pureflow Filtration Systems, Whittier, CA. Programmer.
Mr. Taylor has programmed several PLCs and operator interfaces for Pureflow Filtration System's proprietary freshwater filters. These projects often involved interfacing with existing SCADA systems and coordinating with other control system integrators, as well as system operators. SKM and Mr. Taylor are currently working with Pureflow on several new projects in several different states.

West Wendover SCADA, West Wendover, NV. Programmer/Field Technician.
Mr. Taylor performed all of the programming involved in upgrading the city's HMI computers for their existing SCADA system. The SCADA system includes the WWTP, freshwater, waste water collections, and wastewater reuse. Mr. Taylor and SKM continue to work with West Wendover, assisting them in all of their SCADA maintenance and expansion needs.

Magna EDR and BioBrox Facility, Magna, UT. Programmer.
Mr. Taylor programmed the PLC and HMI for the EDR and BioBrox facility, and was also responsible for commissioning and operator training.

Mark Taylor, E.I.T. - Programmer & Field Technician

Other Project Experience

Payson, UT - WWTP SCADA system support, Reuse facility programming and commissioning

Spanish Fork, UT - WWTP SCADA system support, pump station, screw press, aerator programm and commision

Davis Weber Canal Company, UT - SCADA system support and expansion

Santa Rosa, NM - SCADA System/Instrumentation upgrade

Snyderville Basin, UT - WWTP SCADA system support

Tooele, UT - WWTP SCADA system support

Central Davis SID, UT - WWTP SCADA System support and expansion

Springville, UT - Lift Station Programming/Commisioning, WWTP SCADA system support

Springer , NM - WWTP programming and commissioning

Grantsville, UT - SCADA system expansion and support

Little Mountain, UT - WWTP programming and commisioning

Orem, UT - Headworks programming, SCADA system support

Snowbird, UT - SCADA system support and expansion

Moroni City, UT - SCADA system support, HMI upgrade

EA Miller, UT - Cloth filter programming and commisiioning

Hyrum, UT - SCADA system support

Payson, UT - WWTP SCADA system support, Reuse facility programming and commissioning

Spanish Fork , UT - WWTP SCADA system support, pump station, screw press, aerator programming

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Tovey Ashby - Senior Programmer

(801) 735-5156 - tovey.ashby@skmeng.com

Mr. Ashby has experience with many different aspects of SCADA systems. He has worked with many different programmable logic controllers including Allen Bradley, AutomationDirect, Control Microsystems, Siemens, GE, ControlWave and Modicon. He has used many different operator interfaces including Allen Bradley, Schneider Electric, Siemens, and AutomationDirect. He has extensive experience with Inductive Automation Ignition, GE Proficy iFix, FactoryTalk View and Wonderware HMI software. He also has extensive experience in scripting with VBA and other languages.

Work Experience

13 Years

Education

AS Electrical Automation and Robotics Technology,
Utah Valley University 2004

BS Technology Management,
Utah Valley University 2006

Specialties

Controls engineering; Industrial network design; Radio and telemetry systems; SCADA system design & integration; PLC and HMI design and integration

Project Experience

Salt Lake WWTP, SLC, UT—Programmer/Integrator.
Mr. Ashby has developed streamlined templates and standards for the iFix SCADA system for SLC WWTP. The system includes a redundant SCADA as well as a separate Historian Server along with several Thin Clients. The SCADA system includes custom trending features as well as historical filtering of alarms and other data.

Central Weber Sewer Improvement District, Ogden, UT—Programmer/Integrator.
Mr. Ashby has been integral with other SKM programmers in programming this plant and was forefront on developing/updating SKM's programming standards throughout the project. This system includes a redundant EtherNet network as well as radio communications and a Redundant SCADA system including reporting, alarming, security and video monitoring.

Richmond WWTP, Richmond, UT—Programmer/Integrator.
Mr. Ashby was responsible for the programming of the PLCs, HMI, and touchscreens for the entire wastewater treatment plant. This system is a Kubota MBR. The HMI included system monitoring, reporting, alarming, and full system control.

Jerome WWTP, Jerome, ID—Programmer/Integrator.
Mr. Ashby was responsible for the programming of the PLCs, HMI, and touchscreens for the entire wastewater treatment plant including a Kubota MBR system.

Wolf Creek WWTP, Eden, UT—Programmer/Integrator.
Mr. Ashby was responsible for the programming of the PLCs, HMI, and touchscreens for the entire wastewater treatment plant. The Wolf Creek WWTP was a Zenon MBR plant and required complex programming and system controls.

Rupert WWTP, Rupert, ID—Programmer/Integrator.
Mr. Ashby was responsible for the programming of the PLCs, HMI, and touchscreens for the majority of the wastewater treatment plant and also integrating control systems from multiple vendors into the SCADA system with ControlNet. The HMI included system monitoring, reporting, alarming and full system control. The main PLC system is setup with redundant processors.

Kennecott Utah Copper, Magna, UT—Programmer/Integrator.
Mr. Ashby has been providing contract-programming services for KUCC for over 6 years. During this time he has provided general HMI maintenance, PLC maintenance to the tailings pump stations, the addition of pit area pump stations and multiple other projects. Also, he has provided general maintenance for the South Area Water system. Kennecott exclusively uses Allen Bradley control systems including PLC-5 / SLC / MicroLogix / ControlLogix / CompactLogix processors, various models of PanelView touchscreens, RSView SCADA Software and PowerFlex VFD's / Softstarts that communicate over a variety of protocols including EtherNet / DH+ / DeviceNet / RIO Modules.

APG Neuros—Programmer.
Mr. Ashby has transcribed the standard programs for APG Neuros Turbo Blowers from Allen Bradley into Siemens in various programming languages including LAD/FBD/STL/SCL.

Tovey Ashby - Senior Programmer

Other Project Experience

Wendover WWTP - West Wendover, NV
Simplot Silica Sand Mine, Overton, NV
Bear River WCD - Brigham City, UT
JBS WWTP - Hyrum, UT
Taos WWTP - Taos, NM
Sedona Lift Stations - Sedona, AZ
Blue Mountain Energy Recovery - Blue Mountain, UT
Stansbury WWTP - Stansbury, UT
Jurupa WWTP - Jurupa, CA
Bear River WCD - Brigham City, UT
Gallup Water/Wastewater - Gallup, NM
Idaho Falls Water - Idaho Falls, ID
JBS WWTP - Hyrum, UT

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Fee Estimate | Cost Proposal for the City of Beaumont Lift Station PLC Project

	skm	SKM Principal	SKM Controls Engineer	SKM Project Coordinator	Total Hours	Subtotal - Labor	Sub-consultant budget	Expenses	Total
		$ 190	$ 160	$ 107					
1	Project Management	60	40	10	110	$ 18,870	$ -	$ -	$ 18,870
2	Data Collection & Assessment	8	32		40	$ 6,640	$ -	$ 100	$ 6,740
3	Recommended Upgrades, Improvements and Alternatives	60	80		140	$ 24,200	$ -	$ 100	$ 24,300
Total		128	152	10	290	**$ 49,710**	**$ -**	**$ 200**	**$ 49,910**