



01-05-15 Form CO-1

CHANGE ORDER NO. 3
For Contract between Client and Burns & McDonnell

Project Name: Persigo WWTP Expansion BMCD Project No. 145443
 Client: City of Grand Junction Client Project No. 904-F2107-F21
 Engineer: Burns & McDonnell Contract No. 4972-22

The below noted modification(s) to subject Contract are directed by Client and accepted by Burns & McDonnell (any applicable attachments are specifically identified):

Services as detailed in Attachment A – Scope of Services for Change Order No.3

As a result of the modification(s) described above:

The revised Contract Price is:

Original Contract Price \$ 3,340,568
 Total net amount of all previous Change Orders (+ or -). \$ 907,858
 Total net amount of all previous variable quantity adjustments (+ or -). \$ 0
 Total net amount of this Change Order..... (+ or -). \$ 122,170
 Current Contract Price, including this Change Order..... \$ 4,370,596

The revised Contract Time is:

	<u>Substantial Completion</u>	<u>Ready for Final Payment</u>
Original Completion Date(s).....	<u>08/01/2023</u>	
Total net time adjustment* of all previous Change Orders(+ or -)	<u>0</u>	
Total net time adjustment* of this Change Order.....(+ or -)	<u>0</u>	
* Time adjustment is specified in: <input type="checkbox"/> Working Days <input checked="" type="checkbox"/> Calendar Days <input type="checkbox"/> Other <u>820</u>		
Current Completion Date(s), including this Change Order	<u>03/1/2026</u>	

The price and/or time extension set forth in this Change Order is full compensation for all costs and delays, direct and indirect, incurred in connection with the conditions giving rise to this Change Order, the work specified herein, and any consequential costs, delays, or effects on unchanged work resulting therefrom.

This Change Order, when executed, constitutes a modification to the Contract and all provisions of the Contract, except as modified above and by any previous Change Orders, shall apply hereto.

CLIENT

DocuSigned by:

 9F789E7D50F14BC...
 By Duane Hoff Jr.
 Date 10/9/2023

BURNS & McDONNELL

DocuSigned by:

 3D1BE362978343C...
 By Daniel Korinek, PE, SR Vice President
 Date 10/9/2023

Attachment A

SCOPE OF SERVICES FOR CHANGE ORDER NO. 3

This Contract amendment ("Amendment") to the AGREEMENT is made by and between Burns & McDonnell Engineering Company, Inc. (Engineer) and City of Grand Junction (Owner), this 25th day of August 2023, for the Persigo Wastewater Treatment Plant Expansion.

Whereas, it is the mutual desire of the parties hereto to amend the Professional Engineering Services Consultant for Wastewater Treatment Plant Expansion Projects RFP-4972-22-DH between Owner & Engineer entered into on the 7th day of April 2022, hereinafter called the "Existing Agreement."

Therefore, it is hereby agreed that the Existing Agreement be amended as follows:

SCOPE OF SERVICES:

This amendment will address five Tasks:

Task Series 1700: Fire Protection Design for Dewatering Structures

Task Series 1800: Compliance Submittals in 2023

Task Series 1900: General Administration of the Construction Contract in 2023

Task Series 2000: Coordination with Fiber Optics

Task Series 2100: Blend Tank Redesign

Task 1700: Fire Protection Design for Dewatering Structures

Task 1701 – Project Management

Engineer shall provide coordination and communication for the services in this Task coordinating all disciplines in the development of the design for this task as it pertains to the dewatering building and the dewatered solids storage building adjacent to the dewatering building. Project management includes the quality control of documentation generated as part of these activities. Task includes invoicing and reporting as well as internal team coordination over the project duration.

Task 1702 – Delivery Analysis

Engineer will review the existing fire protection systems and delivery capabilities on the Persigo WWTP site. Data was provided by the Owner and included fire flow testing of the fire hydrants on site. BMCD's review will include an evaluation of available fire hydrant fire flows, evaluate potential improvements to the system to provide external fire flows at the dewatering building location from hydrants external to the building.

Engineer will review this information with Owner staff and local fire department personnel responsible for review and approving of the proposed improvements for the new dewatering processing and storage facilities.

Task 1703 – Fire Protection and Alarm Design

Engineer will design a fire protection system and a fire alarm system consisting of and meeting the design criteria shown below:

Fire Protection:

A complete automatic sprinkler system will be designed throughout the new dewatering building and solids storage structure in accordance with the locally adopted building and fire codes (2018 International Building Code (IBC) and International Fire Code (IFC) with state and local amendments) and NFPA 13, Standard for the Installation of Sprinkler Systems.

- A wet pipe sprinkler system will be provided in areas of the building that are heated.
- A dry pipe sprinkler system will be provided in the Truck Bay area and the Solid Storage structure area.
- The existing water supply to the new building is expected to be adequate to meet IFC fire flow requirements, as well as sprinklers system demand. The latest hydrant flow test information is provided below for information only.

This test was performed on 5/12/2023.

Static: 115 psi

Residual: 82 psi

Flow: 1300 gpm

Available Fire Flow @20 psi: 2301 gpm

Fire Alarm:

- An addressable fire alarm system will be provided for the new dewatering building. The fire alarm system will be in accordance with the locally adopted building and fire codes (2018 IBC and IFC with state and local amendments) and NFPA 72, Fire Alarm and Signaling Code.
- An addressable fire alarm panel will be provided.
- Occupant notification will be provided throughout the facility.
- Fire sprinkler systems will be monitored by the fire alarm system.
- Automatic detection will be provided only where required by the building and fire code or NFPA 72.

The fire alarm system will interface with SCADA, and with the local monitoring station/fire department.

Coordination with the local fire department and building officials will be included in the development of the design documents.

Task 1800: Compliance Submittals

Task 1801 – Compliance Submittals:

Review and approve, or take other appropriate action in respect of, Shop Drawings, Samples, and other submittals and data required to ascertain their general accordance with the Contract Documents.

Estimate includes an initial review of 1st and 2nd round submittals for the following items that are anticipated to be submitted in 2023:

- Influent Screens
- Centrifuges
- UV System
- Blowers
- Truck Scale
- Switchboards
- Motor Control Centers (MCCs)
- Harmonic Filters
- Panel Boards
- Emergency Generator

Task 1900: General Administration of the Construction Contract for 2023

Task 1901 – General Administration of Construction Contract:

Engineer shall provide for general administration of the construction contract specifically pertaining to the requirements and responsibilities during Construction activities. Maintain, at Engineer's office, orderly files for correspondence, reports of job conferences, reproductions of original Contract Documents including Requests for Information and actions taken, Construction Change Directives, Addenda, Change Orders, Field Orders, additional Drawings issued subsequent to the execution of the Contract, clarifications and interpretations of the Contract Documents, progress reports, Shop Drawing submittals and other project related documents.

This task is bridging the time between finalizing design, receiving and approving the GMP from the CMAR which initiates the construction activities of the project. Upon commencement of the construction contract the Construction Services contract between Engineer and Owner will be in place providing for transition to that contract and associated activities.

Task 2000: Coordination with Fiber Optics

Coordination with Fiber Optics Design: The scope of services as outlined below is generally described as the coordination with HDR Engineering in their design of the Fiber Optics loop that will be installed around the WWTP site. This will include general location selection of the duct bank and the modification of the current design to connect to the proposed process equipment controls systems.

Task 2001 – Project Management

Engineer shall provide for general administration of the construction contract specifically pertaining to the requirements and responsibilities outlined within Series 2000 tasks – Fiber Optics Coordination.

Administration also includes the overall project management and quality control of documentation generated as part of the listed change order activities. Task includes invoicing and reporting as well as internal team coordination over the project duration.

Task 2002 – General Coordination of Duct Bank Alignment

Engineer shall provide HDR Engineering with general site plans representing the intended location for utilities that are part of the proposed design improvements for the WWTP Expansion. The information provided to HDR will also consist of the potholing location of utilities obtained during the design. Coordination will also include three virtual meetings with HDR staff to discuss the supplied information.

Task 2003 – Fiber Optics Connectivity

Engineer will coordinate with HDR in the selection of locations for the anticipated Fiber Optics connections. The current design had anticipated the use of radio transmission of data, alarms and other communications and now needs to be modified to the Fiber Optics connections. Engineers' efforts will also include modification of Engineer's current design to locate connections to the proposed Fiber Optics loop and incorporate and design connectivity to the proposed equipment controls.

Task 2100: Redesign of Blend Tank

Task 2101 – Tank Redesign

Owner requested Engineer to modify the size of the dewatering facility's blend tank. The adjustment required an evaluation of capacity based upon new data provided. The adjustment required a structural analysis of the new tank dimensions and adjustment to design drawings and facility model.

TIME OF SERVICE

Change Order shall be completed during the term of July 1, 2023 – March 1, 2026.

This amendment will be deemed a part of, and be subject to, all terms and conditions of the Existing Agreement. Except as modified above, the Existing Agreement will remain in full force and effect.

BURNS & MCDONNELL ENGINEERING CO., INC

ACCEPTED:

By DocuSigned by:
Daniel Korinek, PE, SR Vice President
301BE362978343C...
Title Vice President
Date 10/9/2023

City of Grand Junction

ACCEPTED:

By DocuSigned by:
Duane Hoff Jr.
9F789E7D50F14BC...
Title Contract Administrator
Date 10/9/2023

END OF CHANGE ORDER NO. 3

City of Grand Junction
Wastewater Treatment Expansion Projects

Amendment 3
Fire Protection
Compliance Submittals in 2023
General Administration of the Construction Services in 2023
HDR Fiber Optics Coordination
Blend Tank Redesign

Work Breakdown Structure and Fee Schedule

Activity	Project Manager	Design Manager	Technical Advisor	Process	Structural	Electrical	I&C	Mechanical	Civil	Elec / I&C, Mech, Structural CADD	Fire Protection	Admin Assistant	Quality Control	BMcD Total Labor		Expenses	Direct Expense	Total Cost
	Greg Woodward	Andrew Toth	Brian Knadle	Raegan Swartz	John Kenholz	Vamsi Patwari	Mark Hopkins	David Olsen	Matt Strobel	Amelia Rendon	Emily Han	Admin	QC Reviewer					
	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	ours	Hours	Hours	Hours	Cost	Direct	
TASK SERIES 1700 - Fire Protection Design Dewatering Structures																		
Task 1701 - Project Management	8			4										12	\$ 3,032	\$ 120		\$ 3,152
Task 1702 - Delivery Analysis	2			4							6		1	13	\$ 2,768	\$ 110		\$ 2,878
Task 1703 - Fire Protection Design	1			2							96		7	106	\$ 21,073	\$ 840		\$ 21,913
TASK SERIES 1800 - Compliance Submittals in 2023																		
Task 1801 - Compliance Submittals	8	10		42	6	42	36	4				20	2	170	\$ 38,000	\$ 1,520		\$ 39,520
TASK SERIES 1900 - General Administration of the Construction Contract in 2023																		
Task 1901 - General Administration of Construction Contract	64		16											80	\$ 22,576	\$ 900		\$ 23,476
TASK SERIES 2000 - Coordination with Fiber Loop Consultant																		
Task 2001 - Project Management	10												6	16	\$ 4,522	\$ 180		\$ 4,702
Task 2002 - General Coordination of Duct Bank Alignment		6				6			7					19	\$ 4,989	\$ 200		\$ 5,189
Task 2003 - Fiber Optics Connectivity						12				20				32	\$ 6,696	\$ 270		\$ 6,966
TASK SERIES 2100 - Blend Tank Redesign																		
Task 2101 - Blend Tank Redesign	4			16	22					16			2	60	\$ 13,824	\$ 550		\$ 14,374
	97	16	16	68	28	60	36	4	7	36	102	20	18	508	\$ 117,480	\$ 4,690	\$ -	\$ 122,170
Project Subtotals	97	16	16	68	28	60	36	4	7	36	102	20	18	508	\$ 117,480	\$ 4,690	\$ -	\$ 122,170
Project Total																		\$ 122,170



01-05-15 Form CO-1

CHANGE ORDER NO. 2
For Contract between Client and Burns & McDonnell

Project Name: Persigo WWTP Expansion BMCD Project No. 145443
 Client: City of Grand Junction Client Project No. 904-F2107-F21
 Engineer: Burns & McDonnell Contract No. 4972-22

The below noted modification(s) to subject Contract are directed by Client and accepted by Burns & McDonnell (any applicable attachments are specifically identified):

BMCD to manage, permit and design infrastructure allowing the Persigo WWTP to be permitted for 15.0 MGD as more specifically defined in Attachment A – SCOPE OF SERVICES.

As a result of the modification(s) described above:

The revised Contract Price is:

Original Contract Price	\$ <u>3,340,568</u>
Total net amount of all previous Change Orders	(+ or -) \$ <u>14,286</u>
Total net amount of all previous variable quantity adjustments	(+ or -) \$ <u>0</u>
Total net amount of this Change Order	(+ or -) \$ <u>893,572</u>
Current Contract Price, including this Change Order	\$ <u>4,248,426</u>

The revised Contract Time is:

	<u>Substantial Completion</u>	<u>Ready for Final Payment</u>
Original Completion Date(s)	<u>08/01/2023</u>	
Total net time adjustment* of all previous Change Orders(+ or -)	<u>14</u>	
Total net time adjustment* of this Change Order	(+ or -) <u>108</u>	
* Time adjustment is specified in: <input type="checkbox"/> Working Days <input checked="" type="checkbox"/> Calendar Days <input type="checkbox"/> Other _____		
Current Completion Date(s), including this Change Order	<u>12/1/2023</u>	

The price and/or time extension set forth in this Change Order is full compensation for all costs and delays, direct and indirect, incurred in connection with the conditions giving rise to this Change Order, the work specified herein, and any consequential costs, delays, or effects on unchanged work resulting therefrom.

This Change Order, when executed, constitutes a modification to the Contract and all provisions of the Contract, except as modified above and by any previous Change Orders, shall apply hereto.

CLIENT

BURNS & McDONNELL

DocuSigned by:
Duane Hoff Jr.
 By Duane Hoff Jr. Contract Administrator
 Date 3/16/2023

DocuSigned by:
Daniel Korinek, PE, Vice President - Burns & McDonnell Engineering Company, Inc
 By Daniel Korinek, PE, Vice President President & M
 Date 3/16/2023

Attachment A

SCOPE OF SERVICES for Change Order 2:

In conjunction with the Engineer, the City has determined that a capacity expansion to the Persigo WWTP from the existing permitted capacity of 12.5 MGD to 15.0 MGD is desired. To accomplish this, BMcD (Engineer) will be required to reevaluate all major unit processes throughout the WWTP to assess the capacity and capability of these processes to meet CDPHE Design Criteria. These evaluations will identify the proposed improvements to meet the permitted flow.

The scope of services for the evaluation of the known improvements, aeration basin expansion, and hydraulic constraints will be outlined herein and generally include:

- Hydraulic Evaluation for increase in permitted capacity
- Addition of new Aeration Basins including:
 - Basin structures
 - Diffuser grids
 - Drop header locations for aeration grids
 - Installation of baffle walls
 - Mixed liquor return pumps and associated piping
 - Blower building modifications (accounting for new basins)
 - Walkways and structural design
 - Gate design to mimic current basin arrangement and flow patterns
 - Influent mixing box between new Aeration Basins
 - Process Flow Diagrams (appended PFDs for new basins)
 - Instrumentation & Control Diagrams (appended PFDs for new basins)
 - Power for operation of new basins
 - Return Activated Sludge (RAS) piping and valves to new Aeration Basins
 - RAS pump sizing and specification for replacement
- Modifications to Control Structure # 2 to accommodate piping to new Aeration Basins
- Yard piping between Control Structure # 2 and new Aeration Basins influent mixing box
- Yard piping from Primary Clarifier 1 to Control Structure 2
- Yard piping from new Aeration Basins effluent to Control Structure 3 (common pipe combined with effluent from eastern Aeration Basins)

Task 1601 – Project Management

This task is for internal coordination of the individual disciplines, budget tracking, and additional effort to include these items for invoice preparation.

Task 1602 – Quality Control/Quality Assurance

The project team shall follow Engineer's QA/QC program. This task includes internal review of the project by qualified staff.

Task 1603 – Basis of Design Calculations and Engineering Report Edits

Engineer will revise the Basis of Design calculations and summary documentation that will account for the proposed capacity of 15.0 MGD. This documentation will be used in the Engineering Report as required for the CDPHE Site Location Application. Calculations include process sizing evaluations of unit processes to meet the design requirements provided in the CDPHE DR-1 documentation to be submitted to CDPHE with the Process Design Report. Engineer will update the BioWin model for submission to CDPHE with the Process Design Report.

Task 1604 – Evaluate WWTP Hydraulics at Anticipated Permit Capacity

Engineer will calculate hydraulic limitations throughout the WWTP liquid-stream processes at the flowrate of 15.0 MGD. Engineer will list hydraulic “bottlenecks” of weirs, channels, pipes and control structures. Engineer will identify the modifications necessary to overcome each bottleneck. The design of these bottleneck solutions are provide below in tasks 1606 and 1610. Engineer will submit a “Hydraulics Technical Memorandum” to Owner.

Design Steps for Task 1605 through Task 1613

For Task 1605 through Task 1611 outlined below, the following design development tasks will be completed for each step with any exceptions noted in the specific task description.

Conceptual Design

Engineer will revise the current concept design for each area of improvement to develop the basic improvement intent defining major design elements and considerations that will be evaluated. The improvements are centered around hydraulic limitations and the intent to expand the treatment capacity to 15.0 MGD.

30% Design Documents

Engineer will revise the concept design documentation for the improvements noted. The 30% documents will account for comments and reviews conducted by the City during the 30% document review or work sessions conducted leading to the submission or following submission.

Plans and specifications related to each area of improvement provided by Engineer at the 30% design level included only schematic level documents. Other design elements noted below will have a 30% review work session to allow for City review and comment at which time modifications identified during these reviews will be incorporated into the design and work towards inclusion in 60% Design Documents.

30% Opinion of Probable Construction Cost (OPCC)

Engineer will include in the develop of the 30% OPCC the elements outlined in this change order.

60% Design Documents

Engineer will review comments and notes taken from the 30% review meeting with the intent to revise the 30% design documents. Engineer will continue to develop calculations and refine layout and design details. As part of the City’s review, at least one week to review the plans and specifications prior to holding the 60% Design Review Meeting will be provided. Engineer will provide PDF documents of the plans to the City for review.

90% Design Documents

Engineer will review comments and notes taken from the 60% review meeting with the intent to revise the 60% design documents. Engineer will continue to develop calculations and refine layout and design details. As part of the City’s review, at least one week to review the plans and specifications prior to holding the 90% Design Review Meeting will be provided. Engineer will provide PDF documents of the plans to the City for review.

Issue for Bidding Design Documents

Engineer will review comments and notes taken from the 90% review meeting with the intent to incorporate the relevant comments to develop the Issue for Bidding (CMAR GMP Development) design documents. Engineer will continue to refine layout and design details.

Final GMP Development Support

In conjunction with the existing project, the engineer shall assist the City and Contractor in preparation of the final GMP based on the final design documents. The engineer shall attend a final GMP review meeting to review and discuss the GMP development and approval. All final comments/addenda will be incorporated into the Issued for Construction Documents. The final GMP review meeting will be attended virtually.

Task 1605 – Aeration Basin & Blower Building

Increasing WWTP capacity to 15.0 MGD requires expansion of the aeration basins. The expansion includes modifications necessary to transition the existing aeration basins 1-4 to a single stage nitrification process and the inclusion of new aeration basins into the treatment scheme in an agreed-upon configuration.

The design documents will include the following for the Aeration Basins and Blower Building Relocation:

- Aeration basin modifications to the existing basins 1-4 due to the addition of new basins
- Aeration basin construction of two new basins (east basins)
- Modifications to existing splitter boxes and hydraulic control structure within basins 1-4
- Gate rehabilitation or removal adapting basins 1-4 to the new process arrangement
- Modification to existing aeration and mixing systems to account for process modifications
- Addition of mixed liquor recycle pumps for basins 1-4
- Modifications to existing tankage as required to account for construction of new basins
- Modifications to existing yard piping as required to account for construction of new basins
- New blower building piping and connection of aeration headers for new basins
- New blower building blower layout to include blowers for new basins (this is in addition to the blower arrangement and modifications already part of the design scope)
- Modifications to RAS suction piping, pumps and discharge piping
- Inclusion of internal recycle pumps

Task 1606 – Yard Pipe Modifications (Supply to new basins)

Yard piping for conveyance of flow from control structure #2 to new basins, also to include concept of routing from control structure #2 to route future aeration basins. Yard piping modifications are also necessary for the effluent pipe from new aeration basins which will combine with the existing effluent piping from the eastern aeration basin.

Task 1607 – Primary Treatment Electrical Building

Based upon the review of the current headworks electrical room it was determined that relocation of that functional space was beneficial to the project. The improvements were based upon the new construction requirements for code classification, air handling systems, and construction sequencing of the modifications of the headworks rehabilitation. The new electrical building will be located to the west of the existing grit basins and will incorporate power distribution and controls for equipment in the headworks and the grit building.

Coordination with the City's design improvement of the headworks odor control project will be required as power distribution is anticipated from this new structure.

Building structural design will consider tilt up construction. Engineer provided a layout for the building component arrangement at the 30% package submission. Further design will incorporate the relocation of most electrical control and power systems from the headworks building. Fee for this Task includes civil site design for new electrical building, as well as structural, architectural, mechanical, and electrical design of the building.

Building appears to be in the floodplain, and that will require the finished floor to be one foot above flood elevation. Grading and landscaping will account for this elevation requirement.

Task 1608 – Grit Pump, Classifier Feed Piping & Floor Drain Replacement

Engineer has provided the 30% design of the pump and pipeline replacement. Further design submittals will be part of the 60% and 90% submittals that will replace the grit piping and pumps as an in-kind replacement. Design documents will consist of demolition and reconstruction plans for the two-grit-pump system. Piping alignment will not be changed from the existing routing except to add cleanouts and sampling ports per the City's request.

Based upon communication with the local county building official, the code classification compliance of the entire structure will not be required provided the pump replacement is done without modification and is considered a maintenance activity. Pump design and components will be specified to meet current code for a 'classified' space (as defined under the current code adopted by the City and County building departments) as it is anticipated that future improvements will be made to the entire structure under subsequent phased improvement projects.

In conjunction with the grit system design, it was noted that the floor drains that serve the upper level of the headworks building have deteriorated or calcified to a point they are not useful and require complete replacement. Engineer's design will include removal and replacement in kind to serve the grit classifiers and local floor drains similar to the existing piping. The floor drain discharge location will not change.

Task 1609 – Dewatering Building Centrate Lift Station

The relocation of the dewatering building from the western side of the facility site to the eastern side will require the construction of a lift station for general building drains / waste and centrate from dewatering as the hydraulic grade from this structure's revised location cannot be connected by gravity back into the plants' waste collection system. The lift station will be similar in design to the existing duplex submersible lift station of the plant waste system located adjacent to the existing headworks.

It is assumed that the discharge from the centrate lift station will connect to the overflow piping from control structure #2 thus discharging and combining flow with the primary clarifier overflow into the flow equalization basins.

Task 1610 – Site Piping Hydraulic Improvements

This task encompasses the site improvements associated with the hydraulic limitations in the control structures, and the hydraulic limitations in site piping. Improvements to large-diameter piping and control structures are necessary to facilitate the increased capacity design flow of 15.0 MGD.

The improvements include modification of piping from primary clarifier #1 which currently is piped in series with the flow from primary clarifier #2 to a manhole just upstream of control structure #2. The improvements would include intercepting flow from primary clarifier #1 and routing this flow to control structure #2 directly. Level of effort for modification to control structure #2 is provided under task 1611.

The improvements also include modification of the existing effluent pipe from existing eastern aeration basins, expanding the pipe diameter from the point after the pipe combines with effluent from future aeration basins.

Task 1611 – Control Structure #2 Improvements

This task will encompass improvements that are necessary to address hydraulic limitations in the control structure, connecting piping and how flow will be distribution to existing and proposed aeration basins. Design is anticipated to append the existing control structure allowing for a collection point from the primary clarifiers and distribution to the aeration basins. No changes are proposed to the overflow trough within the control structure which directs flow to the flow equalization basins.

Task 1612 – Second Floor Dewatering Building – Office Arrangement

This task addresses the intended use for portions of the second floor of the dewatering building. The space is being repurposed to include a laboratory, multipurpose space use, mechanical room, restroom, locker room and office space. The details of each of these spaces will be developed through space use diagrams. The space on the second floor is also intended to include the original control room and electrical room.

In addition to the space use modifications the new layout requires additional design for electrical power and lighting plans, elevation and finish schedules, structural considerations and a variety of air handling and conditioning systems to account for use and space.

The addition of a laboratory only includes the most basic of testing for solids handling. The laboratory does not include a lab testing fume hood but will include counter space and cabinetry for testing equipment, sink and emergency eyewash.

Task 1613 – Headworks Roof Truss and Membrane Replacement

Task 1613 addresses both the deteriorating roof trusses in the headworks as well as the roof membrane replacement required due to truss replacement and the relocation of HVAC equipment. The task consists of the development of drawings and specifications for the rehabilitation of the headworks building roof.

Not included in this Scope of Services

This Scope of Services does not include the following:

- Design modifications to structures or processes not explicitly listed in original project scope or herein, including but not limited to:
 - Primary clarifiers
 - Secondary Clarifiers
 - Aerobic digesters
 - Anaerobic digesters
 - DAFT
- Landscaping design or documentation for property landscape buffer.
- Landscape design
- Headworks roof structural replacement
- Plant Water Pump Station roof structural replacement
- Aerobic digested sludge transfer pumps
- Anaerobic digested sludge transfer pumps
- Modifications to existing DAFT
- Excluding all floodplain permitting

City Supplied Data

- none known at this time

City of Grand Junction
Wastewater Treatment Expansion Projects
Work Breakdown Structure and Fee Schedule

Activity	Project Manager	Technical Advisor	Process	Structural	Electrical	I&C	Mechanical	Civil	Architectural	Elec / I&C CADD	Civil	Hydraulics	Process	Process / Civil, Mech CADD	Estimator	BMcD Total Labor		Expenses	Direct Expense (Sub Cost + 10%)	Total Cost
	Greg Woodward	Brian Knadle	Andrew Toth Ryker McDaniel	Kevan Thurman	Vamsi Patwari	Michael Johnson	David Olsen	Nick Tessitore	Ryan Lang Shawn Dalglish	Naweed Aryan	Matt Strobel	Tyler Robinson	Raegan Swartz	Naweed Aryan	Kevin Waddell					
	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Cost	Direct	
Additional Services																				
ADD SERVICE SERIES 1600 - Aeration Basin & Misc Improvements (Change Order 2)																				
Task 1601 - Project Management	122															122	\$34,404	\$1,380	\$0	\$ 35,784
Task 1602 - Quality Control / Quality Assurance	8	40	10	12	16	10	8		8		8	8	8		8	144	\$35,375	\$1,420	\$0	\$ 36,795
Task 1603 - Basis of Design Calculations and Engineering Report Edits	42		116									12	4			174	\$39,250	\$1,570	\$0	\$ 40,820
Task 1604 - Evaluate WWTP Hydraulics at Anticipated Permit Capacity	16		12									62				90	\$20,641	\$830	\$0	\$ 21,471
Task 1605 – Aeration Basin & Blower Building	76	24	316	242	88	164	32	60		64	48			155	62	1,331	\$310,585	\$12,420	\$12,500	\$ 335,505
Task 1606 – Yard Pipe Modifications (Supply to New A-Basins)	4	2	12	16							12	42		14	6	108	\$23,862	\$950	\$0	\$ 24,812
Task 1607 – Primary Treatment Electrical Building	22	4	32	66	60	80	32		80	40	42			10	25	493	\$115,358	\$4,610	\$0	\$ 119,968
Task 1608 – Grit Pump, Classifier Feed Piping & Floor Drain Replacement	8	2	82	8	12	5				20		6		20	4	167	\$35,383	\$1,420	\$0	\$ 36,803
Task 1609 – Dewatering Building Centrate Lift Station	12	2	12	24	28	40				30	16		64		6	234	\$50,818	\$2,030	\$0	\$ 52,848
Task 1610 – Site Piping Hydraulic Improvements	3	2	14	35						22	16	18		16	10	136	\$29,814	\$1,190	\$0	\$ 31,004
Task 1611 – Control Structure #2 Improvements	36	2		46						64	22	68		6	16	260	\$58,448	\$2,340	\$0	\$ 60,788
Task 1612 – Second Floor Dewatering Bldg - Office Arrangement	12	2		32	80	18	32		50	48			12	24	18	328	\$74,104	\$2,960	\$1,500	\$ 78,564
Task 1612 – Headworks Roof Truss and Membrane Replacement	2	1		12			8		45					6	2	76	\$17,698	\$710	\$0	\$ 18,408
																				\$ -
Sub-Total Series 1600	363	81	606	493	284	317	112	60	183	288	164	216	88	251	157	3,663	\$845,742	\$33,830	\$14,000	\$893,572

Schedule of Hourly Professional Service Billing Rates

Position Classification	Classification Level	Hourly Billing Rate
General Office *	5	\$71.00
Technician *	6	\$90.00
Assistant *	7	\$109.00
	8	\$148.00
	9	\$177.00
Staff *	10	\$202.00
	11	\$220.00
Senior	12	\$247.00
	13	\$269.00
Associate	14	\$276.00
	15	\$279.00
	16	\$282.00
	17	\$284.00

NOTES:

1. Position classifications listed above refer to the firm's internal classification system for employee compensation. For example, "Associate", "Senior", etc., refer to such positions as "Associate Engineer", "Senior Architect", etc.
2. For any nonexempt personnel in positions marked with an asterisk (*), overtime will be billed at 1.5 times the hourly labor billing rates shown.
3. For outside expenses incurred by Burns & McDonnell, such as authorized travel and subsistence, and for services rendered by others such as subcontractors, the client shall pay the cost to Burns & McDonnell plus 10%.
4. Monthly invoices will be submitted for payment covering services and expenses during the preceding month. Invoices are due upon receipt. A late payment charge of 1.5% per month will be added to all amounts not paid within 30 days of the invoice date.
5. The services of contract/agency and/or any personnel of a Burns & McDonnell parent, subsidiary or affiliate shall be billed to Owner according to the rate sheet as if such personnel is a direct employee of Burns & McDonnell.
6. The rates shown above are effective for services through December 31, 2023, and are subject to revision thereafter.



01-05-15 Form CO-1

CHANGE ORDER NO. 1
For Contract between Client and Burns & McDonnell

Project Name: Persigo WWTP Expansion BMCD Project No. 145443
Client: City of Grand Junction Client Project No. 904-F2107-F21
Engineer: Burns & McDonnell Contract No. 4972-22

The below noted modification(s) to subject Contract are directed by Client and accepted by Burns & McDonnell (any applicable attachments are specifically identified):

BMCD to identify local surveying companies to provide quotes for a topographic survey for the Persigo WWTP site. BMCD to prepare exhibits that define the extents of the survey and the spot elevations needed for site development design and spot elevations that are needed to support the completion and validation of the hydraulic profile through the treatment system. The deliverable is an electronic Cadd file including field data, a one-foot contour map with identifiable benchmarks for control. Field survey will encompass the entire treatment plant property but does not include a boundary survey.

As a result of the modification(s) described above:

The revised Contract Price is:

Original Contract Price	\$ 3,340,568
Total net amount of all previous Change Orders..... (+ or -).	\$ 0
Total net amount of all previous variable quantity adjustments	(+ or -). \$ 0
Total net amount of this Change Order	(+ or -). \$ 14,286
Current Contract Price, including this Change Order	\$ 3,354,854

The revised Contract Time is:

	Substantial Completion	Ready for Final Payment
Original Completion Date(s)	08/01/2023	
Total net time adjustment* of all previous Change Orders(+ or -)	0	
Total net time adjustment* of this Change Order	(+ or -) 0	
* Time adjustment is specified in: <input type="checkbox"/> Working Days <input checked="" type="checkbox"/> Calendar Days <input type="checkbox"/> Other _____		
Current Completion Date(s), including this Change Order.....	08/15/2023	

The price and/or time extension set forth in this Change Order is full compensation for all costs and delays, direct and indirect, incurred in connection with the conditions giving rise to this Change Order, the work specified herein, and any consequential costs, delays, or effects on unchanged work resulting therefrom.

This Change Order, when executed, constitutes a modification to the Contract and all provisions of the Contract, except as modified above and by any previous Change Orders, shall apply hereto.

CLIENT

By Kurt Carson
Date 8/8/2022

BURNS & McDONNELL

By Daniel D. Korinek
Date 8/5/2022



CITY OF GRAND JUNCTION, COLORADO

CONTRACT

This CONTRACT made and entered into this 7th day of April, 2022 by and between the **City of Grand Junction, Colorado**, a government entity in the County of Mesa, State of Colorado, hereinafter in the Contract Documents referred to as the "Owner" and **Burns & McDonnell Engineering Company, Inc.** hereinafter in the Contract Documents referred to as the "Firm."

WITNESSETH:

WHEREAS, the Owner advertised that sealed Bids would be received for furnishing all labor, tools, supplies, equipment, materials, and everything necessary and required for the Project described by the Contract Documents and known as **Professional Engineering Services Consultant for Wastewater Treatment Plant Expansion Projects RFP-4972-22-DH**.

WHEREAS, the Contract has been awarded to the above-named Firm by the Owner, and said Firm is now ready, willing and able to perform the Work specified in the Notice of Award, in accordance with the Contract Documents;

NOW, THEREFORE, in consideration of the compensation to be paid the Firm, the mutual covenants hereinafter set forth and subject to the terms hereinafter stated, it is mutually covenanted and agreed as follows:

ARTICLE 1

Contract Documents: It is agreed by the parties hereto that the following list of instruments, drawings, and documents which are attached hereto, bound herewith, or incorporated herein by reference constitute and shall be referred to either as the "Contract Documents" or the "Contract", and all of said instruments, drawings, and documents taken together as a whole constitute the Contract between the parties hereto, and they are fully a part of this agreement as if they were set out verbatim and in full herein:

The order of contract document governance shall be as follows:

- a. The body of this contract agreement
- b. Negotiated Terms and Conditions/Scope of Work, Pricing, etc.
- c. Solicitation Documents for the Project; **Professional Engineering Services Consultant for Wastewater Treatment Plant Expansion Projects;**

- d. Firms Response to the Solicitation
- e. Work Change Requests (directing that changed work be performed);
- f. Field Orders
- g. Change Orders.

ARTICLE 2

Definitions: The clauses provided in the Solicitation apply to the terms used in the Contract and all the Contract Documents.

ARTICLE 3

Contract Work: The Firm agrees to furnish all labor, tools, supplies, equipment, materials, and all that is necessary and required to complete the tasks associated with the Work described, set forth, shown, and included in the Contract Documents as indicated in the Solicitation Document.

ARTICLE 4

Contract Time and Liquidated Damages: Time is of the essence with respect to this Contract. The Firm hereby agrees to commence Work under the Contract on or before the date specified in the Solicitation from the Owner, and to achieve Substantial Completion and Final Completion of the Work within the time or times specified in the Firm's negotiated project schedule.

ARTICLE 5

Contract Price and Payment Procedures: The Firm shall accept as full and complete compensation for the performance and completion of all of the Work specified in the Contract Documents, the not to exceed cost of **Three Million Three Hundred Forty Thousand Five Hundred Sixty-Eight and 00/100 Dollars (\$3,340,568.00)**. If this Contract contains unit price pay items, the Contract Price shall be adjusted in accordance with the actual quantities of items completed and accepted by the Owner at the unit prices quoted in the Solicitation Response. The amount of the Contract Price is and has heretofore been appropriated by the Grand Junction City Council Board of Commissioners for the use and benefit of this Project. The Contract Price shall not be modified except by Change Order or other written directive of the Owner. The Owner shall not issue a Change Order or other written directive which requires additional work to be performed, which work causes the aggregate amount payable under this Contract to exceed the amount appropriated for this Project, unless and until the Owner provides Firm written assurance that lawful appropriations to cover the costs of the additional work have been made.

Unless otherwise provided in the Solicitation, monthly partial payments shall be made as the Work progresses. Applications for partial and Final Payment shall be prepared by the Firm and approved by the Owner in accordance with the Solicitation.

ARTICLE 6

Contract Binding: The Owner and the Firm each binds itself, its partners, successors, assigns and legal representatives to the other party hereto in respect to all covenants, agreements and obligations contained in the Contract Documents. The Contract Documents constitute the entire agreement between the Owner and Firm and may only be altered, amended or repealed by a duly executed written instrument. Neither the Owner nor the Firm shall, without the prior written consent of the other, assign or sublet in whole or in part its interest under any of the Contract Documents and specifically, the Firm shall not assign any moneys due or to become due without the prior written consent of the Owner.

ARTICLE 7

Severability: If any part, portion or provision of the Contract shall be found or declared null, void or unenforceable for any reason whatsoever by any court of competent jurisdiction or any governmental agency having the authority thereover, only such part, portion or provision shall be effected thereby and all other parts, portions and provisions of the Contract shall remain in full force and effect.

IN WITNESS WHEREOF, City of Grand Junction, Colorado, has caused this Contract to be subscribed and sealed and attested in its behalf; and the Firm has signed this Contract the day and the year first mentioned herein.

The Contract is executed in two counterparts.

CITY OF GRAND JUNCTION, COLORADO

DocuSigned by:
By: Duane Hoff Jr., Contract Administrator - City of Grand Junction
Duane Hoff Jr., Contract Administrator Date 4/8/2022

Burns & McDonnell Engineering Company, Inc.

DocuSigned by:
By: Daniel Korinek, PE, Vice President - Burns & McDonnell Engineering Company, Inc.
Daniel Korinek, PE, Vice President Burns & McDonnell Engineering Company, Inc. Date 4/8/2022



February 25, 2022

Duane Hoff, Jr.
Senior Buyer
City of Grand Junction
250 N. 5th Street, Room 245
Grand Junction CO 81501

Re: Response to Letter of Intent, RFP-4972-22-DH
Professional Engineering Services Consultant for Wastewater Treatment Expansion Projects

Dear Mr. Hoff:

Burns & McDonnell thanks the City of Grand Junction for the opportunity to participate in the above project. Please find our responses below to your letter dated February 17, 2022.

1. Please re-state your confidence in your submitted pricing, project schedule, and sheet counts.

BMcD Response: We are confident in our estimated sheet count, pricing and schedule based upon the following synopsis of our scope and the scope of services submittal as provided in our proposal response.

Notable Scope Items:

- a. Burns & McDonnell has included a Scope of Services Section in our proposal (Section F) as a basis for our fee. Please review/confirm this is the desired scope and if more/less scope is desired we can adjust the scope of services, fee, and schedule accordingly.*
- b. The list of drawing sheets is approximated based upon our experience relative to the proposed improvements and level of complexity as currently anticipated.*

We do not guarantee the exact sheet count submitted because some areas of the project might need more or less detail to convey the scope of the work to the Contractor but this will not affect our submitted price. Final sheet counts can't be determined until well into the final design of the project.

- c. Workshops and meetings will be held by the Project Manager.*

Those meetings and workshops where BMcD staff will be in Grand Junction include:

- Operator Questionnaire Workshop*
- Equipment Preferences Workshop*



- *Design Review Meetings*
 - *30% Design Review*
 - *60% Design Review*
 - *90% Design Review*
- d. *Bi-weekly Conference Calls*
- e. *Partnering Workshop(s) – We have suggested utilizing partnering workshops between the City, CMGC, and Burns & McDonnell in our proposal to create a more collaborative environment. If the City is interested in including these, we can include the scope/fee in the final documents. Two members from BMcD's team would attend in person at a cost of \$7,651 per meeting which includes travel, one night lodging and a 4 four-hour workshop.*
- f. *Solids Storage Structure – This item is outlined in our assumed scope of work. We just didn't include this in our sheet count.*

2. The committee would like to discuss the possible additional proposed scope:

Flow Equalization Basin Floating Aerator/Mixer Replacement

- Provide a memo on options to replace the floating aerator/mixers in the FE basin with a similar “in-kind” replacement. Include up to 3 potential floating aerator/mixer systems in the evaluation and provide a opinion of cost for equipment procurement. The basis of design for the existing floating aerators will be provided.
- Assist the City in selecting a preferred replacement option and document the selection criteria used. Anticipate 1 meeting for this.
- Develop technical specifications with sufficient detail needed to competitively procure the replacement floating aerator/mixers by no later than July 1, 2022. Assist the City in responding to any technical questions during the bidding process.
- Assume that City staff will install and commission the floating aerator/mixers using in-house resources.

BMcD Response: This effort assumes that the number and style of mixers are similar style to what exists currently which will allow for an in-kind replacement. Assumptions; 1) power connections, motor starters, and controls (whether local or SCADA) will remain the same, 2) mooring supports are the same as existing, 3) details associated with the specification development will take place as part of the kick off meeting or separate virtual meeting.

BMcD Fee for Aerator / Mixer Replacement: \$55,625



3. You mentioned in your interview that Burns & McDonnell also provides full CM/GC construction services as well. We want to clarify that if your firm enters into this contract for professional engineering services for this project, Burns & McDonnell will not be eligible to submit a proposal for the GM/GC portion of the project.

BMcD Response: Acknowledged.

4. The City wishes to discuss your annual rate increases you made note of in your proposal.

BMcD Response: We anticipate this project to have three major phases of effort and fees associated with each phase. These phases consist of:

- *Phase 1 – Conceptual and Preliminary Design which would take the design to 60% and a negotiated GMP with the selected CMAR.*
- *Phase 2 – Final Design*
- *Phase 3 – Engineering Services During Construction*

Currently we have a fee estimated for all three phases as part of our submittal. We would request that we enter a contract for Phase 1 and Phase 2 based upon our understanding and content of scope as submitted in the proposal. These two phases would have a lump sum fee for the term of 18 months.

Under this contract we would invoice on a percent complete and should BMcD's rates increase in 2023 it will not impact the value of the contract with the City.

Burns & McDonnell Additional Questions for Discussion:

- The contract is silent on the subject of labor force location. At present we are working more with our international offices and there is a potential due to deadlines that we would integrate these staff into the development of the project design documents. If this is acceptable can we please add the following language to the contract:

Contractor may engage temporary staffing agencies or obtain assistance from its affiliates and subsidiaries including, without limitation, Burns & McDonnell Canada Ltd., Burns & McDonnell International Inc., and Burns & McDonnell India Pvt. Ltd. ("Labor Sources") to fulfill Contractor's performance obligations under this Agreement. The parties agree that contracts, purchase orders, or similar agreements between Contractor and any Labor Sources are not subcontracts as that term is used in this Agreement, and personnel from such Labor Sources shall be billed according to the applicable rate sheet for the Scope of Work as if such personnel is a direct hire employee. Personnel from Labor Sources shall be considered agents of Contractor and able to act on behalf of Contractor within the scope of the authority granted such personnel according to job function and billing classification.



Relating to Item 4: We would recommend entering into a Phase 1 and Phase 2 contract and then once the CMAR Contractor is selected and joins in the design we will be able to better understand the level of involvement that will be needed during the construction phase from BMcD. Additionally, the scope of work in the request for proposal didn't address certain engineering services during construction (shop drawing reviews, as-built drawings, etc.) that would typically be performed by the engineer of record. Another unknown is the construction sequence and duration, thus the number of progress meetings and extent of the requested inspection services cannot be quantified. The proposal stated:

- Design services during construction will include responding to CMGC requests for information (RFIs) regarding design, changed field conditions, and attending construction progress meetings,
 - For the RFIs and Change in Field Conditions we assumed the following for our discipline leads:

RFIs		Field Orders	
Assume 320		Assume 160	
Structural	60	Structural	30
Architectural	30	Architectural	15
Mechanical	20	Mechanical	15
Process	90	Process	45
Power	50	Power	25
I&C	50	I&C	25
Civil	20	Civil	5
<hr/>		<hr/>	
320		160	

- Our Estimate was based upon the Design Manager attending 30 monthly on-site meetings @ 12 hours per meeting and 30 months of virtual meetings @ 3 hours per meeting or a total of 540 hours. Additionally, the Project Manager has 90 hours of support for this task.
- Services during construction will also include construction inspection services, as needed depending upon the availability of City staffing resources. The design engineer will provide construction inspection services as needed to supplement City staffing and to provide specialty inspection services. The duration and schedule for construction



inspection services will depend upon the construction sequencing schedule developed by the CMGC.

- BMcD didn't include time for construction inspection services, nor specialty inspection services, noting that this was not defined and would be on an as needed basis.

With these unknowns, the likelihood that the City will require additional services beyond what has been defined, and the fact that there is a likelihood of labor effort being required in the year 2025 that is not defined at this time we would suggest developing the scope and fees for this work once defined and the CMAR contractor selection has been completed.

We look forward to working with the City on this project. Please do not hesitate to call with any questions or comments.

Sincerely,

A handwritten signature in blue ink, reading "Jason Schaefer".

Jason Schaefer, PE

Regional Global Practice Manager
cc. BMcD – G. Woodward, B. Knadle

Attach: Revised fee proposal

CONTRACT COMMENTS WITH CONTEXT

- ▶ Section 2.3 – We would prefer changing the section 2.3 to be more specific to the project by replace “all laws” with “applicable laws” and “bearing on” with “in”. **The City accepts this request**
- ▶ Section 2.5 – This section contradicts how I believe you want the Firm to be paid. This section assumes the firm will be paid based on percent complete of work. I believe you stated yesterday that you wanted us to be paid based on billable rates and the amount individuals have worked. We can discuss when I give you a call later today. **The City accepts this request.**
- ▶ Section 2.6 – This section refers to the contractor erecting and maintaining facilities with regard to safety and damage to existing infrastructure. As a designer of record, we will not have control over means and methods or damage to an existing facility. We propose removing this section. These statements are more applicable to a general contractor. **The City accepts this request.**
- ▶ Section 2.9 – This section is more applicable to a general contractor than a professional engineer. We propose removing this section of the contract. **The City accepts this request.**
- ▶ Section 2.13 - We would prefer changing the section 2.13 to be more specific to the project by replace “all federal” with “applicable federal” and “warrants” with “represents.” **The City accepts this request.**
- ▶ Section 2.15 – This section should be expanded to allow our team to be able to coordinate with permitting agencies, subconsultants, equipment vendors. During the meeting yesterday Randi mentioned that all information is public record so there should not be a confidentiality clause. **The City accepts this request.**
- ▶ Section 2.26 – We propose changing the first sentence to read as follows to more closely match professional engineer’s insurance policies: “Offeror shall indemnify the Owner and all its officers, employees from and against any injuries or damages received or sustained by any person, persons, or third-party property but only to the extent caused by any negligent act or omission of the Offeror, or any Offeror’s agent, employee, subcontractor or supplier in the execution of, or performance under, any contract which may result from proposal award.” **The City shall not accept this request.**
- ▶ Section 3.1 – Replace “sufficient to insure against all liabilities, claims, demands, and other obligations assumed by the Firm pursuant to this Section” with “as required herein **and/or under any contract which may result from proposal award.**” **The City accepts this request to include the City’s added language.**

Require the specific insurance requirements by removing the word “minimum” throughout. **The City accepts this request.**

Replace “Comprehensive” with “Commercial”. **The City accepts this request.**

Remove “This policy shall provide coverage to protect the contractor against liability incurred as a result of the professional services performed **under any contract which may result from proposal award.**” **The City accepts this request to include the City’s added language.**

- ▶ Include a limit of liability based on the overall contract value. **The City shall not accept this request.**
- ▶ Contractor may engage temporary staffing agencies or obtain assistance from its affiliates and subsidiaries including, without limitation, Burns & McDonnell Canada Ltd., Burns & McDonnell International Inc., and Burns & McDonnell India Pvt. Ltd. (“Labor Sources”) to fulfill Contractor’s performance obligations under this Agreement. The parties agree that contracts, purchase orders, or similar agreements between Contractor and any Labor Sources are not subcontracts as that term is used in this Agreement, and personnel from such Labor Sources shall be billed according to the applicable rate sheet for the Scope of Work as if such personnel is a direct hire employee. Personnel from Labor Sources shall be considered agents of Contractor and able to act on behalf of Contractor within the scope of the authority granted such personnel according to job function and billing classification. **The City accepts this request.**



Scope of Services

Revised 3/9/2022

Wastewater Treatment Plant Expansion Projects
Design Phase Services
City of Grand Junction

Scope of Services

TASK SERIES 100 – PROJECT MANAGEMENT/GENERAL

Task 101 – Project Management

This task is for internal coordination of the individual disciplines, budget tracking, and invoice preparation.

Task 102 – Project Kickoff Meeting

Engineer shall coordinate and lead a Project Kickoff meeting at the facility. During the Project Kickoff meeting the collective project team shall identify the project goals, coordinate activities, discuss project requirements, establish a project schedule, identify key project issues/concerns, identify key personnel who are to provide input on the project, and get initial input on design items.

Task 103 – Bi-weekly Progress Meetings

Virtual bi-weekly meetings will occur during the design phase through Bidding Assistance and culminating with the acceptance of the GMP from the CMGC Contractor to extend for a period of 15 months. **These meetings will fall between the onsite meetings not being held when other meetings or workshops are being held.**

Task 104 – Quality Control/Quality Assurance

The project team shall follow Engineer's QA/QC program. This task includes internal review of the project by qualified staff.

Task 105 – Topographic Survey Assistance

Engineer shall coordinate with a City contracted licensed surveyor to conduct field surveys in sufficient detail to provide a topographic map suitable for detailed design. The survey shall show property boundaries and easements necessary for the project, as well as the location of all utilities and surface features that are likely to affect the project.

Task 106 – Geotechnical Investigation Assistance

Engineer shall coordinate with a City contracted licensed geotechnical firm to conduct soil borings and laboratory tests at key locations as needed to determine subsurface conditions. The geotechnical firm shall provide a geotechnical report with recommendations for the foundation and design of new building(s), basins, site paving, etc.

TASK SERIES 200 – PROCESS EVALUATION

Task 200 – Review of Existing Studies, Reports, Flow/Load Data, & Design Documents

Engineer shall collect and review existing reports/design documents and facility operational data to support our understanding of the facility. This information will be used to generate a baseline for the planning and design of the new upgrades.

Task 201 – Identify Process Options

- ▶ For each of the four areas BMcD will conduct a process evaluation for those processes listed below:
- ▶ Aeration Basin Asset Revitalization and Blower Building
 - The process options that will be included in the review will consist of a variation of blower technology:
 - Turbo Blowers
 - Hybrid Turbo Blowers
- ▶ Disinfection Operational Improvements
 - The process options that will be included in the review will consist of a variation of UV technologies:
 - Horizontal UV systems
 - Vertical UV Systems
 - Angled UV Systems
- ▶ New Dewatering Building and Solids Storage
 - Centrifuges
 - Review 3 vendor supplied systems
 - Chemical Feed Systems
 - Review 3 vendor supplied systems
- ▶ Headworks Improvements
 - Screening Technology
 - Review 3 vendor supplied systems
 - Screening Conveyance
 - Review Shaftless screw systems
 - Review Pleated belt conveyor
 - Screening Wash Press
 - Review 2 vendor supplied systems
 - Grit classifier
 - Review 2 vendor supplied systems

Task 202 – Develop Design Criteria for Each Work Area

Engineer shall provide a Basis of Design report that will include the process system sizing requirements as well as building classification that will establish design criteria for access and egress as well as criteria for heating, ventilation, I&C and Power distribution.

The Basis of Design report will be developed in context for submission to the CDPHE in support of the permitting processes for new treatment facilities.

Task 203 – Operator Questionnaires & Workshop

Engineer shall develop a questionnaire for the City's operational staff. The goal of the questionnaire is to gather data related to operator preferences and items relating to past operations history and maintenance issues at the existing facility that may be relevant to the design of this facility. Once the questionnaires are completed and returned, Engineer shall conduct a workshop with the City's Operational and Engineering representatives to discuss the responses. **The workshop will be on site at the Persigo WWTP.**

Task 204 – Equipment Preferences Workshop & Equipment Site Visits

Engineer shall develop a process equipment seminar for the City's operational staff. The goal of the seminar is to provide valuable information on the process equipment options available that may be relevant to the design of this facility. Once the seminar is complete, Engineer shall coordinate site visits to allow the operation's staff to see firsthand the preferred equipment and discuss the pros/cons with other facility's operational staff.

The equipment site visits will include an 8-hour day of touring facilities along the front range that has several systems like those manufacturers identified. The workshop to establish preferences will be on site at the Engineer's office and would be followed with the day of site tours.

Task 205 – Process Evaluation Summary Technical Memorandum

Engineer shall develop a technical memorandum documenting all the previous tasks in the process evaluation section.

Task 206 – Process Evaluation Summary Technical Memo Review Meeting

Engineer shall conduct a final Microsoft Team's online review meeting to discuss the technical memorandum. Comments received by City will be considered and incorporated into the final document as appropriate.

TASK SERIES 300 – CONCEPTUAL DESIGN

Task 300 – Conceptual Designs

- ▶ The conceptual design documentation will include:
- ▶ Aeration Basin Asset Revitalization and Blower Building
 - Drawings which provide plan views and select section views of:
 - Aeration basin modifications to basins 1-4.
 - Modifications to splitter box and gate rehabilitation
 - Modification to aeration grid and associated mixing systems
 - Modifications to existing tankage
 - New Blower building & reconnection of aeration headers
 - New blower building blower layout
 - Concept expansion for new blower building
 - Draft specifications for equipment exceeding \$100,000

- ▶ Disinfection Operational Improvements
 - Drawings which provide plan views and select section views of:
 - Drawings of the modifications to existing chlorine contact channels
 - Addition of new UV systems
 - Modifications to existing UV systems (as required)
 - Draft specification for new UV equipment
- ▶ New Dewatering Building and Solids Storage
 - Concept level drawings which provide plan views and select section views of:
 - Dewatering building
 - Centrifuge process area
 - Conveyance systems
 - Truck load out area
 - Chemical storage and fee systems
 - Ancillary rooms
 - Draft specifications for centrifuge and other equipment exceeding \$100,000.
- ▶ Headworks Improvements
 - Concept level drawings which provide plan views and select section views of:
 - Headworks floor plan
 - Grit system improvements
 - Conveyance systems
 - Screenings and grit load out area
 - Ancillary rooms
 - Draft specifications for:
 - Screening equipment
 - Screenings wash press
 - Grit classifier
 - Grit and Screenings Conveyance
 - Other equipment exceeding \$100,000.

Task 301 – Conceptual Design Summary Technical Memo

Engineer shall develop a technical memorandum documenting all the previous tasks in the conceptual design section.

Task 302 – Conceptual Design Summary Technical Memo Review Meeting

Engineer shall conduct a final Microsoft Team's review meeting to discuss the technical memorandum. Comments received by City will be considered and incorporated into the final document as appropriate.

TASK SERIES 400 – PRELIMINARY DESIGN

Task 400– 30% Design Documents

Plans and specifications shall be provided by Engineer at the 30% design level. The 30% Documents shall include the following:

- ▶ Specification Table of Contents

- ▶ Civil Drawings (if necessary)
- ▶ Architectural Drawings (if necessary)
- ▶ Structural Drawings
- ▶ Plumbing Drawings
- ▶ Mechanical Drawings
- ▶ Process Drawings
- ▶ Electrical Drawings
- ▶ Instrumentation and Controls Drawings

The City shall be given at least one week to review the plans and outline specifications prior to holding the 30% Design Review Meeting. PDF documents of the plans along with the specifications will be provided to the City for review.

The design fee estimate is based on the following primary upgrades at the facility, should any of the upgrades change this will be considered supplemental services and require an amendment:

- ▶ Aeration Basin Asset Revitalization and Blower Building
 - Gate Replacement
 - Modification to aeration basins for:
 - New diffuser grids
 - New drop header locations for grid replacement
 - Modification of 2 of 4 basins replacing pilot study curtains with permanent baffle walls
 - Addition of low head wall pump
 - Electrical modifications to support wall pump
 - Blower Building
 - At grade building design includes:
 - Replacement of PD blowers with high efficiency high speed blowers
 - Reconnection to existing headers accounting for new diffuser grids
 - Heating, ventilation, process mechanical, electrical, I&C supporting the design of the new building.
 - Building material is masonry
 - Assume tall single-story structure, flat roof matching existing building architecture
- ▶ Disinfection Operational Improvements
 - Addition of new UV system
 - Structural support of new system in existing chlorine contact basin
 - Power and I&C design for the new system
- ▶ New Dewatering Building and Solids Storage
 - Design of 2 story dewatering building including:
 - Partially buried Blending tank for primary and secondary solids streams
 - Basement for centrifuge solids feed pumps
 - 1st story loadout bay
 - 1st story chemical storage and feed systems

- 1st story chemical spill storage
- New centrifuges, assuming 3 units on 2nd story
- Conveyance system of dewatered cake to truck in 1st story loadout bay
- Modification to dewatering feed pumps both primary and secondary solids
- Process mechanical, electrical, I&C supporting the design of the new building and equipment
- Heating, ventilation to meet occupancy requirements and discharge to odor control
- Odor Control: At grade biofilter
- Building material is masonry, flat roof matching existing building architecture
- Dewatered Cake Solids Storage
 - Pole barn style structure: 30' clear span steel frame
 - Push wall along frame lines and back wall
 - Storage dimension 100'x210'
- ▶ Headworks Improvements
 - Modification to headworks building for:
 - Code compliance egress and separation
 - New HVAC & Power distribution to meet applicable NFPA & NEC codes
 - Replacement of 2 screens
 - Replacement of screenings wash press
 - Replacement of screenings conveyance system
 - Replacement of grit classifiers
 - Process mechanical, electrical, I&C supporting the design of the new building.

Task 401 – 30% Engineer's Opinion of Probable Construction Cost

Based on the 30% design documents, Engineer shall prepare the engineer's opinion of probable cost for the project. This cost opinion will be submitted along with the design documents for review and comment by the City. The cost opinion will be based on recent bid tabulation information, current markets, historical cost data, and discussions with local suppliers and contractors. All assumptions will be included for reference.

Task 402 – 30% Design Review Meeting

After the Owner has had an opportunity to review the 30% design documents, Engineer shall conduct a 30% design review meeting. The purpose of this meeting is to provide the Owner and Engineer an opportunity to clarify City comments on the documents. Engineer shall provide meeting minutes with a decision log and a list of action items. Meeting minutes will be distributed via e-mail and document comments will be incorporated into the 60% design documents as appropriate. **The design review meeting will be on site at the Persigo WWTP.**

TASK SERIES 500 – CM/GC SELECTION

Task 500 – CM/GC Contractor RFP Process

Engineer shall assist the City in developing a list of prequalified CMGC Contractors to propose on the project. The list of prequalified CMGC contractors will be developed based on the Engineer's knowledge and experience, City's input, and CMGC Contractor's experience in the water/wastewater construction industry.

City shall prepare and issue a request for proposal for CMGC Contractor procurement. The proposal documents shall include proposal requirements and the 30% design documents, which shall be of adequate detail to provide CMGC Contractors sufficient information to propose a comparative fee to construct the facility.

Engineer will assist the City in preparing and distributing the pre-proposal meeting agenda and attend the pre-proposal meeting. The Engineer shall assist the City in any written responses/addenda required after the pre-proposal meeting.

Task 501 – Contractor Interviews & Selection Assistance

The Engineer shall attend CMGC Contractor interviews and assist the City in the evaluation of the CMGC Contractor's responses to rank, select and procure the CMGC Contractor.

The Engineer shall provide a contractor recommendation based on the proposal evaluation and Engineer's knowledge and experience.

The Engineer shall assist the City and CMGC Contractor in preparation of the IGMP based on the 30% design documents. The Engineer shall conduct an IGMP review meeting to review and discuss the IGMP development and steps/schedule that need to be accomplished to complete the final design. The IGMP is based on the CMGC Contractor's experience and judgment and will be used to establish a budget for the project and to make decisions for final design that may include cost considerations.

TASK SERIES 600 – PERMITTING

Task 600 – CDPHE Site Application

Engineer shall develop the Site Application Report that will include all items listed in the Site Application Checklist as published by CDPHE at the time of submittal. Engineer shall submit the Site Application to CDPHE, and address revisions as required by CDPHE to achieve final approval. City is responsible for permitting fees to CDPHE.

Task 601 – CDPHE Process Design Report

Engineer shall develop the Process Design Report that will include all items listed in the PDR Checklist as published by CDPHE at the time of submittal. Engineer shall submit the Process Design Report to CDPHE, and address revisions as required by CDPHE to achieve final approval. City is responsible for permitting fees to CDPHE.

Task 602 – City, County, & Fire Authority Permitting

Engineer shall submit the required documents to the City, County, & Fire Authority and address revisions as required to achieve final approval. City is responsible for permitting fees.

TASK SERIES 700 – DETAILED DESIGN

Task 700 – 60% Design Documents

Plans and specifications shall be provided by Engineer at the 60% design level. The 60% Documents shall include the following:

- ▶ Technical Specifications
- ▶ All drawings indicated in 30% review drawings brought to 60% completion
- ▶ Additional Detail drawings that are needed for final design

The City and CMGC Contractor shall be given at least one week to review the plans and outline specifications prior to holding the 60% Design Review Meeting. PDF documents of the plans along with the specifications will be provided to the City and CMGC Contractor for review.

Task 701 – 60% GMP

The Engineer shall assist the City and CMGC Contractor in preparation of the 60% GMP based on the 60% design documents. The Engineer shall attend a 60% GMP review meeting **completed at the same time as the 60% Design Review Meeting** to review and discuss the GMP development and steps that need to be accomplished to complete the final design. The GMP will be used to make decisions for final design that may include cost considerations.

Task 702 – 60% Design Review Meeting

After the City and CMGC Contractor have had an opportunity to review the 60% design documents, Engineer shall conduct a 60% design review meeting. The purpose of this meeting is to provide the City, CMGC Contractor, and Engineer an opportunity to clarify comments on the documents. Engineer shall provide meeting minutes with a decision log and a list of action items. Meeting minutes will be distributed via e-mail and comments will be incorporated into the 90% design documents as appropriate. **The design review meeting will be on site at the Persigo WWTP.**

Task 703 – Major Process Equipment Bidding/Selection

Engineer shall prepare and assist CMGC Contractor with issuing specifications and drawings to major process equipment manufacturers for competitive bidding solicitation. This task includes issuing specifications & drawings, issuing addenda, proposal formulation and review, assistance with the evaluation and formal selection of major process equipment. The selected major process equipment will be included in the final design documents.

Task 704 – Maintenance of Operations Plan

Engineer shall develop a maintenance of operations plan for each area of the project in collaboration with the City and CMGC Contractor.

Task 705 – 90% Design Documents

Plans and specifications shall be provided by Engineer at the 90% design level. The 90% Plans shall include the following:

- ▶ Refined Technical Specifications
- ▶ All drawings indicated in 60% review drawings brought to 90% completion
- ▶ Additional Detail drawings that are needed for final design

The City and CMGC Contractor shall be given at least one week to review the plans and specifications prior to holding the 90% Design Review Meeting. PDF documents of the plans will be provided to the City and CMGC Contractor for review.

Task 706 – 90% GMP

The Engineer shall assist the City and CMGC Contractor in preparation of the 90% GMP based on the 90% design documents. The Engineer shall attend a 90% GMP review meeting **completed at the same time as the 90% Design Review Meeting** to review and discuss the GMP development and steps that need to be accomplished to complete the final design. The GMP will be used to make decisions for final design that may include cost considerations.

Task 707 – 90% Design Review Meeting

After the City and CMGC Contractor have had an opportunity to review the 90% design documents, Engineer shall conduct a 90% design review meeting. The purpose of this meeting is to provide the City, CMGC Contractor, and Engineer an opportunity to clarify comments on the documents. Engineer shall provide meeting minutes with a decision log and a list of action items. Meeting minutes will be distributed via e-mail and comments will be incorporated into the IFB design documents as appropriate. **The design review meeting will be on site at the Persigo WWTP.**

Task 708 – Issue for Bid Design Documents

Engineer shall prepare and submit Issue for Bid plans and specifications for bidding purposes. The plans and specifications will incorporate final comments prior to bidding.

Task 709 – Bidding or Negotiating Phase

After acceptance by City of the final Drawings and Specifications, other Construction Contract Documents, bidding-related documents (or requests for proposals or other construction procurement documents), and upon authorization by City to proceed, Engineer shall assist City and CMGC Contractor, as appropriate to bid and develop the final GMP.

Task 710 – Final GMP Development Support

The engineer shall assist the City and Contractor in preparation of the final GMP based on the final design documents. The engineer shall attend a final GMP review meeting to review and discuss the GMP development and approval. **All final comments/addenda will be incorporated into the Issued for Construction Documents. The final GMP review meeting will be attended virtually.**

TASK SERIES 800 – DESIGN SUPPORT DURING CONSTRUCTION

Construction is assumed to commence June 2023 and run for 30 months ending at the end of December 2025.

Task 801 – CMGC Request for Information

Review and respond to RFIs in writing and prepare and issue supplemental drawings and specifications as necessary in response to RFIs. Maintain an orderly record of all RFIs, responses provided to the CMGC Contractor, and documentation of each RFI's resolution.

Level of effort is based on a total of 320 RFI's that require an average of 2 hours each for review and response to CMGC Contractor. Project Management accounts for an additional 80 hours of support.

Task 802 – Changed Field Conditions

Review and comment on prospective changed field conditions. Evaluate and make recommendations to City on changes when appropriate. Provide Work Change Directives (no cost design changes) as needed. Track changes and obtain City approval prior to returning direction to the CMGC Contractor.

Level of effort is for documentation of Changed Field Conditions is based on a total of 160 Field Orders that require an average of 2 hours each for development, review, and response / directive to CMGC Contractor. Project Management accounts for an additional 80 hours of support.

Task 803 – Attending Construction Progress Meetings

The Engineer shall prepare for and attend weekly progress meetings to consult with the City during the construction period relative to general administration of the construction. The Engineer shall attend construction progress meetings in-person once per month. Level of effort includes travel, meeting attendance and travel expenses.

Additional weekly meetings for each month will be attended virtually. CMGC Contractor will develop and conduct these meetings.

TASK SERIES 900 – ADDITIONAL DESIGN SUPPORT DURING CONSTRUCTION (NOT INCLUDED PER RFP BUT ASSUME WILL BE AMENDED)

Construction Observation and Residential Project Representative
Construction Inspection Services
General Administration of Construction Contract
Pre-Construction Conference
Compliance Submittals
Work Compliance Site Visits
Special Inspections
Processes Start-Up Assistance
Pre-Start-Up Workshops
Equipment Operation's Training

Operations & Maintenance Manual
Conduct Final Inspection
CDPHE Certifications
Conforming to Construction Record Drawings

TASK SERIES 1000 – CMGC DELIVERY PARTNERING MEETINGS

Task 1001 - Travel and Attendance of Partnering Meetings

This task would be for two (2) BMcD staff to prepare, travel, and attend two (2) Partnering / Team Building meetings with City staff, CMGC Contractor representatives and other designated key team members. Meetings are anticipated to be a four (4) hour duration for each meeting.

TASK SERIES 1100 – AERATOR / MIXER REPLACEMENT

From the City's Letter of Intent, a request to assist in the design, permitting and bidding assistance for the flow equalization's aerator / mixer replacement. This replacement is to include the following:

- Provide a memo on options to replace the floating aerator/mixers in the FE basin with a similar "in-kind" replacement. Include up to 3 potential floating aerator/mixer systems in the evaluation and provide a opinion of cost for equipment procurement. The basis of design for the existing floating aerators will be provided.
- Assist the City in selecting a preferred replacement option and document the selection criteria used. Anticipate 1 meeting for this.
- Develop technical specifications with sufficient detail needed to competitively procure the replacement floating aerator/mixers by no later than July 1, 2022 Assist the City in responding to any technical questions during the bidding process.
- Assume that City staff will install and commission the floating aerator/mixers using in-house resources.

Task 1101 – Tech Memo

This task will include the evaluation of three (3) manufacturers floating surface aerators / mixers for replacement of the existing equipment in the flow equalization basin. Evaluation will include mixing zones as defined by the manufacturers and recommendation for location and quantity.

Task 1102 – Assist the City with Permitting

This design is anticipating this to be an 'In-Kind' replacement for the mixing of the flow equalization basins. Discussion will be held with the CDPHE to address the requirements of the In-Kind replacement. The submittal for this request to the CDPHE is anticipated to include a letter request with supporting design documents to obtain approval.

No other permits are included.

Task 1103 – Mixer Specification

The design will include the development of a technical specification suitable for attachment to the City's standard purchase order which will include the standard terms and conditions for a purchase of this equipment.

Task 1104 – Bidding Assistance

Engineer shall answer questions from interested vendors by providing response to the City for inclusion in a City issued addendum to the bidding documents. A virtual pre bid meeting is included.

TASK SERIES 1200 – OPERATIONS & MAINTENANCE DESIGN REVIEW

Task 1201 – Preparation, Travel and Conducting O&M 30% Design Review

Engineer shall develop a 3D graphical representation of the proposed improvements for the four areas of project improvements: Headworks, Disinfection, Blower Building and Dewatering. This meeting will be held on-site lasting 4 hours and will incorporate 3D visuals for review by maintenance and operations staff of the 30% design.

Task 1202 – Preparation, Travel and Conducting O&M 60% Design Review

Engineer shall develop a 3D graphical representation of the proposed improvements for the four areas of project improvements: Headworks, Disinfection, Blower Building and Dewatering. This meeting will be held on-site lasting 4 hours and will incorporate 3D visuals for review by maintenance and operations staff of the 60% design.

TASK SERIES 1300 – DISINFECTION SYSTEM BUILDING

Task 1301 – Technical Memo Addition to Disinfection Memo

Engineer shall develop content to be added to the Disinfection technical memorandum that will address the inclusion of a building over the current and proposed disinfection improvements. This building is anticipated to cover the entire channel length (east to west) and the first two channel widths (north to south). This existing structure was not likely designed to support a building and will likely require structural improvements. Structural review will be a key part of this evaluation and once completed Engineer shall review the findings with City staff to validate the intent and design of the proposed improvements.

Task 1302 – Concept Design

Engineer shall develop a conceptual design layout once the design intent from Task 1301 has been defined. Concept design will include location of the proposed UV improvements, layout of access and egress, and location of electrical equipment.

Task 1303 – 30% Design

Engineer shall develop content for inclusion in the 30% Design submittal as outlined in Task 400 above.

Task 1304 – 60% Design

Engineer shall develop content for inclusion in the 60% Design submittal as outlined in Task 700 above.

Task 1305 – 90% Design

Engineer shall develop content for inclusion in the 90% Design submittal as outlined in Task 705 above.

Task 1306 – IFB Documents

Engineer shall develop content for inclusion in the IFB documents as outlined in Task 708 above and incorporate all comments/questions into the final IFC documents.

TASK SERIES 1400 – POWER / CONTROLS COORDINATION MEETINGS

Task 1401 – Coordination Meetings w/ SCADA Control Master Plan

Engineer has included 10 hours of time associated with coordination of the SCADA master Planning that is occurring under a separate contract. These coordination meetings will be held virtually between Engineer's instrumentation and controls design support staff and designer / Contractor responsible for the master planning approach for the treatment facilities SCADA system improvements.

Task 1402 – Coordination Meetings w/ Medium Power Loop Design

Engineer has included 10 hours of time associated with coordination of the medium voltage loop replacement that is occurring under separate contract. These coordination meetings will be held virtually between Engineer's power distribution design support staff and designer / Contractor responsible for the layout and construction of the medium voltage loop.

City of Grand Junction
Wastewater Treatment Expansion Projects
Work Breakdown Structure and Fee Schedule

Activity	Project Manager	Design Manager	Technical Advisor	Process	Structural	Electrical	I&C	Mechanical	Civil	Architectural	Elec / I&C, Mech, Structural CADD	Estimator	Quality Control	BMcD Total Labor		Expenses	Direct Expense	Total Cost
	Greg Woodward	Andrew Waddoups	Brian Knade	Andrew Toth Raegan Swartz	Kevan Thurman	Vamsi Patwari	Michael Johnson	David Olsen	Nick Tessitore	Ryan Lang Shawn Dalglish	Naweed Aryan	Kevin Waddell	Brett Pugh	Hours	Cost	Direct	Cost	
TASK SERIES 100 - Project Management/General	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Cost	Direct	Cost	
Task 101 - Project Management	200	100	40	80	40	40	40	40	40	40	40			700	\$170,820	\$6,630		\$ 177,650
Task 102 - Project Kickoff Meeting	8	8	8	8	8	8	8	8	8					72	\$17,816	\$710	\$7,000	\$ 25,526
Task 103 - Bi-weekly Progress Meetings	52	52	12	52										168	\$41,208	\$1,650	\$18,000	\$ 60,858
Task 104 - Quality Control/Quality Assurance	16	16	4		40	40	40	24	24	40			40	284	\$69,600	\$2,780		\$ 72,380
Task 105 - Topographic Survey Assistance	8	8							8					24	\$6,360	\$250		\$ 6,610
Task 106 - Geotechnical Investigation Assistance	8	8			8									24	\$6,296	\$250		\$ 6,546
Sub-Total Series 100	292	192	64	140	96	88	88	72	80	80	40	0	40	1,272	\$312,100	\$12,470	\$25,000	\$348,570
TASK SERIES 200 - Process Evaluation																		
Task 200 - Review of Existing Studies, Reports, Flow/Load Data & Design Documents	4	8	4	20	8	8	8	8	8	8				84	\$19,756	\$790		\$ 20,546
Task 201 - Identify Process Options	40	80	40	120										280	\$66,280	\$2,650		\$ 68,930
Task 202 - Develop Design Criteria for Each Work Area	4	16	2	80	8	8	8	8	4	8				148	\$32,774	\$1,310		\$ 34,084
Task 203 - Operator Questionnaires & Workshop	12	12	4	40										68	\$15,404	\$620	\$3,000	\$ 19,024
Task 204 - Equipment Preferences Workshop & Equipment Site Visits	16	16	16	40										88	\$20,680	\$830	\$3,000	\$ 24,510
Task 205 - Process Evaluation Summary Technical Memorandum	4	8	4	40										56	\$12,200	\$490		\$ 12,690
Task 206 - Process Evaluation Summary Technical Memo Review Meeting	12	4	4	12										32	\$7,712	\$310	\$2,000	\$ 10,022
Sub-Total Series 200	92	146	74	352	16	16	16	16	12	16	0	0	0	756	\$174,806	\$7,000	\$8,000	\$189,806
TASK SERIES 300 - Conceptual Design																		
Task 300 - Conceptual Design	8	20	8	400	12	12	12	12	12	12				508	\$106,444	\$4,260		\$ 110,704
Task 301 - Conceptual Design Summary Technical Memo	4	8	4	20	8	8	8	8	8	8				84	\$19,756	\$790		\$ 20,546
Task 302 - Conceptual Design Summary Technical Memo Review Meeting	4	4	4	4										16	\$3,976	\$160	\$2,000	\$ 6,136
Sub-Total Series 300	16	32	16	424	20	20	20	20	20	20	0	0	0	608	\$130,176	\$5,210	\$2,000	\$137,386
TASK SERIES 400 - Preliminary Design																		
Task 400 - 30% Design Documents	40	80	20	400	120	120	120	100	100	120	400			1,620	\$345,880	\$13,840		\$ 359,720
Task 401 - 30% Engineer's Opinion of Probable Construction Cost	24	20	4	64	16	12	12	12	12	12		80		268	\$64,796	\$2,590		\$ 67,386
Task 402 - 30% Design Review Meeting	12	12	4	12	2	2	2	2	2	2		8		60	\$14,812	\$590	\$3,000	\$ 18,402
Sub-Total Series 400	76	112	28	476	138	134	134	114	114	134	400	88	0	1,948	\$425,488	\$17,020	\$3,000	\$445,508
TASK SERIES 500 - CM/GC Selection																		
Task 500 - CM/GC Contractor RFP Process	40	20		40										100	\$23,980	\$960		\$ 24,940
Task 501 - Contractor Interviews & Selection Assistance	16	12		20										48	\$11,448	\$460	\$2,000	\$ 13,908
Sub-Total Series 500	56	32	0	60	0	0	0	0	0	0	0	0	0	148	\$35,428	\$1,420	\$2,000	\$38,848
TASK SERIES 600 - Permitting																		
Task 600 - CDPHE Site Application	8	16		80					40					144	\$32,784	\$1,310		\$ 34,094
Task 601 - CDPHE Process Design Report	8	20	2	80										110	\$23,888	\$960		\$ 24,848
Task 602 - City, County, & Fire Authority Permitting	8	20	2	40	20	20	20	20	20	20				190	\$44,768	\$1,790		\$ 46,558
Sub-Total Series 600	24	56	4	200	20	20	20	20	60	20	0	0	0	444	\$101,440	\$4,060	\$0	\$105,500
TASK SERIES 700 - Detailed Design																		
Task 700 - 60% Design Documents	150	200	80	300	225	240	200	180	150	100	400			2,225	\$504,280	\$20,170		\$ 524,450
Task 701 - 60% GMP	8	8	8	8	2	2	2	2	2	2		40		84	\$21,316	\$850		\$ 22,166
Task 702 - 60% Design Review Meeting	12	12	4	12								4		44	\$10,880	\$440	\$3,000	\$ 14,320
Task 703 - Major Process Equipment Bidding/Selection	20	40	20	40										120	\$29,160	\$1,170		\$ 30,330
Task 704 - Maintenance of Operations Plan	20	40	20	80	2	2	2					4		170	\$36,602	\$1,980		\$ 38,582
Task 705 - 90% Design Documents	200	200	40	300	200	200	200	150	150	100	300			2,040	\$468,280	\$18,730		\$ 487,010
Task 706 - 90% GMP	20	8	8	8	2	2	2	2	2	2		40		96	\$24,532	\$980		\$ 25,512
Task 707 - 90% Design Review Meeting	12	12	4	12	2	2	2	2	2	2		4		56	\$13,764	\$550	\$3,000	\$ 17,314
Task 708 - Issue of Bid Design Documents	8	20	8	80	20	20	20	20	20	20	200			436	\$87,500	\$3,500		\$ 91,000
Task 709 - Bidding or Negotiating Phase	20	40	20	40	16	24	24	8	8	14				214	\$51,390	\$2,060		\$ 53,450
Task 710 - Final GMP Development Support	16	12	8	24										60	\$14,340	\$570		\$ 14,910
Sub-Total Series 700	456	592	220	904	468	492	452	364	334	240	900	92	0	5,545	\$1,265,054	\$50,600	\$6,000	\$1,321,654
TASK SERIES 800 - Design Services During Construction																		
Task 801 - Responding to CMGC Requests for Information	40	40		180	120	100	100	40	40	60				720	\$167,100	\$6,680		\$ 173,780
Task 802 - Addressing Changed Field Conditions	40	40		90	60	50	50	30	10	30				400	\$94,130	\$3,770		\$ 97,900
Task 803 - Attending Construction Progress Meetings	90	540												630	\$167,220	\$6,690	\$30,000	\$ 203,910
Sub-Total Series 800	170	620	0	270	180	150	150	70	50	90	0	0	0	1,750	\$428,450	\$17,140	\$30,000	\$475,590
TASK SERIES 900 - Additional Engineering Services During Construction (NOT INCLUDED IN EXISTING CONTRACT)																		
Task 901 - Construction Observation and Residential Project Representative - TBD																		
Task 902 - Construction Inspection Services - TBD																		
Task 903 - General Administration of Construction Contract- TBD																		
Task 904 - Pre-Construction Conference - TBD																		
Task 905 - Compliance Submittals - TBD																		
Task 906 - Work Compliance Site Visits - TBD																		
Task 907 - Special Inspections - TBD																		
Task 908 - Processes Start-Up Assistance - TBD																		
Task 909 - Pre-Start-Up Workshops - TBD																		
Task 910 - Equipment Operation's Training - TBD																		
Task 911 - Operations & Maintenance Manual - TBD																		
Task 912 - Conduct Final Inspection - TBD																		
Task 913 - CDPHE Certifications - TBD																		
Task 914 - Conforming to Construction Record Drawings - TBD																		
Sub-Total Series 900																		
TASK SERIES 1000 - Partnering Activities																		
Task 1001 - Travel and Attendance of Partnering Meetings (2 mtgs, 2 persons)	24	24												48	\$12,792	\$510	\$4,000	\$ 17,302
Sub-Total Series 1000	24	24	0	0	0	0	0	0	0	0	0	0	0	48	\$12,792	\$510	\$4,000	\$ 17,302
TASK SERIES 1100 - Aerator / Mixer Replacement																		
Task 1101 Technical Memo	8			160										168	\$33,984	\$1,360	\$0	\$ 35,344
Task 1102 Assist City in Permitting	2			2										4	\$934	\$40	\$0	\$ 974
Task 1103 Mixer Specification	4			60									2	66	\$13,542	\$540	\$0	\$ 14,082
Task 1104 Bidding Assistance	4			20										24	\$5,052	\$200	\$0	\$ 5,252
Sub-Total Series 1100	18	0	0	242	0	0	0	0	0	0	0	0	2	262	\$53,512	\$2,140	\$0	\$55,652
TASK SERIES 1200 - Operation & Maintenance Design Review																		
Task 1201 - Prep, Travel and Conducting O&M 30% Design Review	16			24										40	\$9,064	\$360	\$2,000	\$ 11,424
Task 1202 - Prep, Travel and Conducting O&M 60% Design Review	16			24										40	\$9,064	\$360	\$2,000	\$ 11,424
Sub-Total Series 1200	32	0	0	48	0	0	0	0	0	0	0	0	0	80	\$18,128	\$720	\$4,000	\$22,848
TASK SERIES 1300 - Disinfection System Building																		
Task 1301 Technical Memo Addition to Disinfection Memo	2	2		4	2	2		2		2				16	\$3,714	\$150	\$0	\$ 3,864
Task 1302 Conceptual Design	8	6		22	18	8		8		8				78	\$18,080	\$720	\$0	\$ 18,790
Task 1303 30% Design	16	6		16	32	16		12		18	30	14	2	162	\$36,522	\$1,480	\$0	\$ 37,982
Task 1304 60% Design	16	6		46	48	38		18		30	44	12	2	260	\$66,986	\$2,980	\$0	\$ 69,966
Task 1305 90% Design	12	4		32	40	18		12		18	32	6	2	176	\$38,790	\$1,580	\$0	\$ 40,340
Task 1306 IFB Documents	4	4		12	4	12		8		12	12		2	70	\$15,106	\$600	\$0	\$ 15,706
Sub-Total Series 1300	58	28	0	132	144	94	0	60	0	88	118	32	8	762	\$188,178	\$6,760	\$0	\$194,938
TASK SERIES 1400 - Power / Controls Coordination Meetings																		
Task 1401 - Coordination Meetings w/ SCADA Control Master Plan	2						8							10	\$2,568	\$100	\$0	\$ 2,668
Task 1402 - Coordination Meetings w/ Medium Power Loop Design	2													10	\$2,208	\$90	\$0	\$ 2,298
Sub-Total Series 1400	4</																	



**Request for Proposal
RFP-4972-22-DH**

**Professional Engineering Services Consultant
for Wastewater Treatment Plant Expansion
Projects**

RESPONSES DUE:

January 14, 2022 prior to 3:00 PM

Accepting Electronic Responses Only

**Responses Only Submitted Through the Rocky Mountain E-Purchasing System
(RMEPS)**

<https://www.rockymountainbidsystem.com/default.asp>

(Purchasing Representative does not have access or control of the vendor side of RMEPS. If website or other problems arise during response submission, vendor **MUST** contact RMEPS to resolve issue prior to the response deadline. 800-835-4603)

NOTE: All City solicitation openings will continue to be held virtually.

PURCHASING REPRESENTATIVE:

Duane Hoff Jr., Senior Buyer

duaneh@gjcity.org

970-244-1545

This solicitation has been developed specifically for a Request for Proposal intended to solicit competitive responses for this solicitation, and may not be the same as previous City of Grand Junction solicitations. All offerors are urged to thoroughly review this solicitation prior to submitting. Submittal by **FAX, EMAIL or HARD COPY IS NOT ACCEPTABLE** for this solicitation.

REQUEST FOR PROPOSAL

TABLE OF CONTENTS

Section

1.0	Administrative Information and Conditions for Submittal
2.0	General Contract Terms and Conditions
3.0	Insurance Requirements
4.0	Specifications/Scope of Services
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6.0	Evaluation Criteria and Factors
7.0	Solicitation Response Form

REQUEST FOR PROPOSAL

SECTION 1.0: ADMINISTRATIVE INFORMATION & CONDITIONS FOR SUBMITTAL

NOTE: It is the Firm's responsibility to read and review all solicitation documentation in its entirety, and to ensure that they have a clear and complete understanding of not only the scope, specifications, project requirements, etc., but also all other requirements, instructions, rules, regulations, laws, conditions, statements, procurement policies, etc. that are associated with the solicitation process and project/services being solicited.

- 1.1 Issuing Office:** This Request for Proposal (RFP) is issued by the City of Grand Junction. All contact regarding this RFP is directed to:

RFP QUESTIONS:

Duane Hoff Jr., Senior Buyer
duaneh@gjcity.org

The City would like to remind all Firms, Sub-Firms, Vendors, Suppliers, Manufacturers, Service Providers, etc. that (with the exception of Pre-Bid or Site Visit Meetings) all questions, inquiries, comments, or communication pertaining to any formal solicitation (whether process, specifications, scope, etc.) must be directed (in writing) to the Purchasing Agent assigned to the project, or Purchasing Division. Direct communication with the City assigned Project Managers/Engineers is not appropriate for public procurement, and may result in disqualification.

- 1.2 Non-Mandatory Site Visit Meeting:** **Prospective offerors are encouraged to attend a non-mandatory site visit meeting on December 9, 2021 at 11:00am.** Meeting location shall be in the Persigo Wastewater Treatment Plant Conference Room, located at 2145 River Road, Grand Junction, CO The purpose of this visit will be to inspect and to clarify the contents of this Request for Proposal (RFP).
- 1.3 Purpose:** The purpose of this RFP is to obtain proposals from qualified professional engineering firms or individuals to provide engineering design, permitting, bidding, project management, and design services during construction for Wastewater Treatment Plant Expansion projects.
- 1.4 The Owner:** The Owner is the City of Grand Junction, Colorado and is referred to throughout this Solicitation. The term Owner means the Owner or his authorized representative.
- 1.5 Compliance:** All participating Offerors, by their signature hereunder, shall agree to comply with all conditions, requirements, and instructions of this RFP as stated or implied herein. Should the Owner omit anything from this packet which is necessary to the clear understanding of the requirements, or should it appear that various instructions are in conflict, the Offeror(s) shall secure instructions from the Purchasing Division prior to the date and time of the submittal deadline shown in this RFP.
- 1.6 Submission:** Please refer to section 5.0 for what is to be included. **Each proposal shall be submitted in electronic format only, and only through the Rocky Mountain E-**

Purchasing website (<https://www.rockymountainbidsystem.com/default.asp>). *This site offers both “free” and “paying” registration options that allow for full access of the Owner’s documents and for electronic submission of proposals. (Note: “free” registration may take up to 24 hours to process. Please Plan accordingly.)* Please view our “**Electronic Vendor Registration Guide**” at <http://www.gjcity.org/business-and-economic-development/bids/> for details. **The uploaded response to this RFP shall be a single PDF document with all required information included.** For proper comparison and evaluation, the City requests that proposals be formatted as directed in Section 5.0 “Preparation and Submittal of Proposals.” Submittals received that fail to follow this format may be ruled non-responsive. (Purchasing Representative does not have access or control of the vendor side of RMEPS. If website or other problems arise during response submission, vendor **MUST** contact RMEPS to resolve issue prior to the response deadline. 800-835-4603).

Please join Solicitation Opening, RFP-4972-22-DH, Professional Engineering Services Consultant for Wastewater Treatment Plant Expansion Projects on GoTo from your computer using the Chrome browser. <https://app.goto.com/meet/538387685>

You can also dial in using your phone.

Dial-In

(646) 749-3335

Access Code

538-387-685

Audio PIN

1

- 1.7 Altering Proposals:** Any alterations made prior to opening date and time must be initialed by the signer of the proposal, guaranteeing authenticity. Proposals cannot be altered or amended after submission deadline.
- 1.8 Withdrawal of Proposal:** A proposal must be firm and valid for award and may not be withdrawn or canceled by the Offeror for sixty (60) days following the submittal deadline date, and only prior to award. The Offeror so agrees upon submittal of their proposal. After award this statement is not applicable.
- 1.9 Acceptance of Proposal Content:** The contents of the proposal of the successful Offeror shall become contractual obligations if acquisition action ensues. Failure of the successful Offeror to accept these obligations in a contract shall result in cancellation of the award and such vendor shall be removed from future solicitations.
- 1.10 Addenda:** All questions shall be submitted in writing to the appropriate person as shown in Section 1.1. Any interpretations, corrections and changes to this RFP or extensions to the opening/receipt date shall be made by a written Addendum to the RFP by the City Purchasing Division. Sole authority to authorize addenda shall be vested in the City of Grand Junction Purchasing Representative. Addenda will be issued electronically through the Rocky Mountain E-Purchasing website at www.rockymountainbidsystem.com. Offerors shall acknowledge receipt of all addenda in their proposal.
- 1.11 Exceptions and Substitutions:** All proposals meeting the intent of this RFP shall be considered for award. Offerors taking exception to the specifications shall do so at their

own risk. The Owner reserves the right to accept or reject any or all substitutions or alternatives. When offering substitutions and/or alternatives, Offeror must state these exceptions in the section pertaining to that area. Exception/substitution, if accepted, must meet or exceed the stated intent and/or specifications. The absence of such a list shall indicate that the Offeror has not taken exceptions, and if awarded a contract, shall hold the Offeror responsible to perform in strict accordance with the specifications or scope of services contained herein.

- 1.12 Confidential Material:** All materials submitted in response to this RFP shall ultimately become public record and shall be subject to inspection after contract award. **“Proprietary or Confidential Information”** is defined as any information that is not generally known to competitors and which provides a competitive advantage. Unrestricted disclosure of proprietary information places it in the public domain. Only submittal information clearly identified with the words **“Confidential Disclosure”** and uploaded as a separate document shall establish a confidential, proprietary relationship. Any material to be treated as confidential or proprietary in nature must include a justification for the request. The request shall be reviewed and either approved or denied by the Owner. If denied, the proposer shall have the opportunity to withdraw its entire proposal, or to remove the confidential or proprietary restrictions. Neither cost nor pricing information nor the total proposal shall be considered confidential or proprietary.
- 1.13 Response Material Ownership:** All proposals become the property of the Owner upon receipt and shall only be returned to the proposer at the Owner’s option. Selection or rejection of the proposal shall not affect this right. The Owner shall have the right to use all ideas or adaptations of the ideas contained in any proposal received in response to this RFP, subject to limitations outlined in the entitled “Confidential Material”. Disqualification of a proposal does not eliminate this right.
- 1.14 Minimal Standards for Responsible Prospective Offerors:** A prospective Offeror must affirmably demonstrate their responsibility. A prospective Offeror must meet the following requirements.
- Have adequate financial resources, or the ability to obtain such resources as required.
 - Be able to comply with the required or proposed completion schedule.
 - Have a satisfactory record of performance.
 - Have a satisfactory record of integrity and ethics.
 - Be otherwise qualified and eligible to receive an award and enter into a contract with the Owner.
- 1.15 Open Records:** Proposals shall be received and publicly acknowledged at the location, date, and time stated herein. Offerors, their representatives and interested persons may be present. Proposals shall be received and acknowledged only so as to avoid disclosure of process. However, all proposals shall be open for public inspection after the contract is awarded. Trade secrets and confidential information contained in the proposal so identified by offer as such shall be treated as confidential by the Owner to the extent allowable in the Open Records Act.
- 1.16 Sales Tax:** The Owner is, by statute, exempt from the State Sales Tax and Federal Excise Tax; therefore, all fees shall not include taxes.

- 1.17 Public Opening:** Proposals shall be opened in a virtual meeting in the City Hall Auditorium, 250 North 5th Street, Grand Junction, CO, 81501, immediately following the proposal deadline. Offerors, their representatives and interested persons may be present. Only the names and locations on the proposing firms will be disclosed.

SECTION 2.0: GENERAL CONTRACT TERMS AND CONDITIONS

- 2.1. Acceptance of RFP Terms:** A proposal submitted in response to this RFP shall constitute a binding offer. Acknowledgment of this condition shall be indicated on the Letter of Interest or Cover Letter by the autographic signature of the Offeror or an officer of the Offeror legally authorized to execute contractual obligations. A submission in response to the RFP acknowledges acceptance by the Offeror of all terms and conditions including compensation, as set forth herein. An Offeror shall identify clearly and thoroughly any variations between its proposal and the Owner's RFP requirements. Failure to do so shall be deemed a waiver of any rights to subsequently modify the terms of performance, except as outlined or specified in the RFP.
- 2.2. Execution, Correlation, Intent, and Interpretations:** The Contract Documents shall be signed by the Owner and Firm. By executing the contract, the Firm represents that they have familiarized themselves with the local conditions under which the Services is to be performed, and correlated their observations with the requirements of the Contract Documents. The Contract Documents are complementary, and what is required by any one, shall be as binding as if required by all. The intention of the documents is to include all labor, materials, equipment, services and other items necessary for the proper execution and completion of the scope of services as defined in the technical specifications and drawings contained herein. All drawings, specifications and copies furnished by the Owner are, and shall remain, Owner property. They are not to be used on any other project.
- 2.3. Permits, Fees, & Notices:** The Firm shall secure and pay for all permits, governmental fees and licenses necessary for the proper execution and completion of the services. The Firm shall give all notices and comply with all laws, ordinances, rules, regulations and orders of any public authority bearing on the performance of the services. If the Firm observes that any of the Contract Documents are at variance in any respect, he shall promptly notify the Owner in writing, and any necessary changes shall be adjusted by approximate modification. If the Firm performs any services knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Owner, he shall assume full responsibility and shall bear all costs attributable.
- 2.4. Responsibility for those Performing the Services:** The Firm shall be responsible to the Owner for the acts and omissions of all his employees and all other persons performing any of the services under a contract with the Firm.
- 2.5. Payment & Completion:** The Contract Sum is stated in the Contract and is the total amount payable by the Owner to the Firm for the performance of the services under the Contract Documents. Upon receipt of written notice that the services is ready for final inspection and acceptance and upon receipt of application for payment, the Owner's Project Manager will promptly make such inspection and, when they find the services acceptable under the Contract Documents and the Contract fully performed, the Owner shall make payment in the manner provided in the Contract Documents. Partial payments

will be based upon estimates, prepared by the Firm, of the value of services performed and materials placed in accordance with the Contract Documents. The services performed by Firm shall be in accordance with generally accepted professional practices and the level of competency presently maintained by other practicing professional firms in the same or similar type of services in the applicable community. The services and services to be performed by Firm hereunder shall be done in compliance with applicable laws, ordinances, rules and regulations.

- 2.6. Protection of Persons & Property:** The Firm shall comply with all applicable laws, ordinances, rules, regulations and orders of any public authority having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss. Firm shall erect and maintain, as required by existing safeguards for safety and protection, and all reasonable precautions, including posting danger signs or other warnings against hazards promulgating safety regulations and notifying owners and users of adjacent utilities. When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect, or misconduct by the Firm in the execution of the services, or in consequence of the non-execution thereof by the Firm, they shall restore, at their own expense, such property to a condition similar or equal to that existing before such damage or injury was done, by repairing, rebuilding, or otherwise restoring as may be directed, or it shall make good such damage or injury in an acceptable manner.
- 2.7. Changes in the Services:** The Owner, without invalidating the contract, may order changes in the services within the general scope of the contract consisting of additions, deletions or other revisions. All such changes in the services shall be authorized by Change Order/Amendment and shall be executed under the applicable conditions of the contract documents. A Change Order/Amendment is a written order to the Firm signed by the Owner issued after the execution of the contract, authorizing a change in the services or an adjustment in the contract sum or the contract time.
- 2.8. Minor Changes in the Services:** The Owner shall have authority to order minor changes in the services not involving an adjustment in the contract sum or an extension of the contract time and not inconsistent with the intent of the contract documents.
- 2.9. Uncovering & Correction of Services:** The Firm shall promptly correct all services found by the Owner as defective or as failing to conform to the contract documents. The Firm shall bear all costs of correcting such rejected services, including the cost of the Owner's additional services thereby made necessary. The Owner shall give such notice promptly after discover of condition. All such defective or non-conforming services under the above paragraphs shall be removed from the site where necessary and the services shall be corrected to comply with the contract documents without cost to the Owner.
- 2.10. Acceptance Not Waiver:** The Owner's acceptance or approval of any services furnished hereunder shall not in any way relieve the proposer of their present responsibility to maintain the high quality, integrity and timeliness of his services. The Owner's approval or acceptance of, or payment for, any services shall not be construed as a future waiver of any rights under this Contract, or of any cause of action arising out of performance under this Contract.

- 2.11. Change Order/Amendment:** No oral statement of any person shall modify or otherwise change, or affect the terms, conditions or specifications stated in the resulting contract. All amendments to the contract shall be made in writing by the Owner.
- 2.12. Assignment:** The Offeror shall not sell, assign, transfer or convey any contract resulting from this RFP, in whole or in part, without the prior written approval from the Owner.
- 2.13. Compliance with Laws:** Proposals must comply with all Federal, State, County and local laws governing or covering this type of service and the fulfillment of all ADA (Americans with Disabilities Act) requirements. Firm hereby warrants that it is qualified to assume the responsibilities and render the services described herein and has all requisite corporate authority and professional licenses in good standing, required by law.
- 2.14. Debarment/Suspension:** The Firm hereby certifies that the Firm is not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Governmental department or agency.
- 2.15. Confidentiality:** All information disclosed by the Owner to the Offeror for the purpose of the services to be done or information that comes to the attention of the Offeror during the course of performing such services is to be kept strictly confidential.
- 2.16. Conflict of Interest:** No public official and/or Owner employee shall have interest in any contract resulting from this RFP.
- 2.17. Contract:** This Request for Proposal, submitted documents, and any negotiations, when properly accepted by the Owner, shall constitute a contract equally binding between the Owner and Offeror. The contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral, including the Proposal documents. The contract may be amended or modified with Change Orders, Field Orders, or Amendment.
- 2.18. Project Manager/Administrator:** The Project Manager, on behalf of the Owner, shall render decisions in a timely manner pertaining to the services proposed or performed by the Offeror. The Project Manager shall be responsible for approval and/or acceptance of any related performance of the Scope of Services.
- 2.19. Contract Termination:** This contract shall remain in effect until any of the following occurs: (1) contract expires; (2) completion of services; (3) acceptance of services or, (4) for convenience terminated by either party with a written *Notice of Cancellation* stating therein the reasons for such cancellation and the effective date of cancellation at least thirty days past notification.
- 2.20. Employment Discrimination:** During the performance of any services per agreement with the Owner, the Offeror, by submitting a Proposal, agrees to the following conditions:
- 2.20.1. The Offeror shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, age, disability, citizenship status, marital status, veteran status, sexual orientation, national origin, or any legally protected status except when such condition is a legitimate occupational

qualification reasonably necessary for the normal operations of the Offeror. The Offeror agrees to post in conspicuous places, visible to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.

- 2.20.2. The Offeror, in all solicitations or advertisements for employees placed by or on behalf of the Offeror, shall state that such Offeror is an Equal Opportunity Employer.
- 2.20.3. Notices, advertisements, and solicitations placed in accordance with federal law, rule, or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section.

2.21. Immigration Reform and Control Act of 1986 and Immigration Compliance: The Offeror certifies that it does not and will not during the performance of the contract employ illegal alien services or otherwise violate the provisions of the Federal Immigration Reform and Control Act of 1986 and/or the immigration compliance requirements of State of Colorado C.R.S. § 8-17.5-101, *et seq.* (House Bill 06-1343).

2.22. Ethics: The Offeror shall not accept or offer gifts or anything of value nor enter into any business arrangement with any employee, official, or agent of the Owner.

2.23. Failure to Deliver: In the event of failure of the Offeror to deliver services in accordance with the contract terms and conditions, the Owner, after due oral or written notice, may procure the services from other sources and hold the Offeror responsible for any costs resulting in additional purchase and administrative services. This remedy shall be in addition to any other remedies that the Owner may have.

2.24. Failure to Enforce: Failure by the Owner at any time to enforce the provisions of the contract shall not be construed as a waiver of any such provisions. Such failure to enforce shall not affect the validity of the contract or any part thereof or the right of the Owner to enforce any provision at any time in accordance with its terms.

2.25. Force Majeure: The Offeror shall not be held responsible for failure to perform the duties and responsibilities imposed by the contract due to legal strikes, fires, riots, rebellions, and acts of God beyond the control of the Offeror, unless otherwise specified in the contract.

2.26. Indemnification: Offeror shall defend, indemnify and save harmless the Owner and all its officers, employees, insurers, and self-insurance pool, from and against all liability, suits, actions, or other claims of any character, name and description brought for or on account of any injuries or damages received or sustained by any person, persons, or property on account of any negligent act or fault of the Offeror, or of any Offeror's agent, employee, sub-Firm or supplier in the execution of, or performance under, any contract which may result from proposal award. Offeror shall pay any judgment with cost which may be obtained against the Owner growing out of such injury or damages.

2.27. Independent Firm: The Offeror shall be legally considered an Independent Firm and neither the Firm nor its employees shall, under any circumstances, be considered servants or agents of the Owner. The Owner shall be at no time legally responsible for any negligence or other wrongdoing by the Firm, its servants, or agents. The Owner shall not withhold from the contract payments to the Firm any federal or state unemployment taxes,

federal or state income taxes, Social Security Tax or any other amounts for benefits to the Firm. Further, the Owner shall not provide to the Firm any insurance coverage or other benefits, including Workers' Compensation, normally provided by the Owner for its employees.

- 2.28. Nonconforming Terms and Conditions:** A proposal that includes terms and conditions that do not conform to the terms and conditions of this Request for Proposal is subject to rejection as non-responsive. The Owner reserves the right to permit the Offeror to withdraw nonconforming terms and conditions from its proposal prior to a determination by the Owner of non-responsiveness based on the submission of nonconforming terms and conditions.
- 2.29. Ownership:** All plans, prints, designs, concepts, etc., shall become the property of the Owner.
- 2.30. Oral Statements:** No oral statement of any person shall modify or otherwise affect the terms, conditions, or specifications stated in this document and/or resulting agreement. All modifications to this request and any agreement must be made in writing by the Owner.
- 2.31. Patents/Copyrights:** The Offeror agrees to protect the Owner from any claims involving infringements of patents and/or copyrights. In no event shall the Owner be liable to the Offeror for any/all suits arising on the grounds of patent(s)/copyright(s) infringement. Patent/copyright infringement shall null and void any agreement resulting from response to this RFP.
- 2.32. Venue:** Any agreement as a result of responding to this RFP shall be deemed to have been made in, and shall be construed and interpreted in accordance with, the laws of the City of Grand Junction, Mesa County, Colorado.
- 2.33. Expenses:** Expenses incurred in preparation, submission and presentation of this RFP are the responsibility of the company and cannot be charged to the Owner.
- 2.34. Sovereign Immunity:** The Owner specifically reserves its right to sovereign immunity pursuant to Colorado State Law as a defense to any action arising in conjunction to this agreement.
- 2.35. Public Funds/Non-Appropriation of Funds:** Funds for payment have been provided through the Owner's budget approved by the City Council/Board of County Commissioners for the stated fiscal year only. State of Colorado statutes prohibit the obligation and expenditure of public funds beyond the fiscal year for which a budget has been approved. Therefore, anticipated orders or other obligations that may arise past the end of the stated Owner's fiscal year shall be subject to budget approval. Any contract will be subject to and must contain a governmental non-appropriation of funds clause.
- 2.36. Collusion Clause:** Each Offeror by submitting a proposal certifies that it is not party to any collusive action or any action that may be in violation of the Sherman Antitrust Act. Any and all proposals shall be rejected if there is evidence or reason for believing that collusion exists among the proposers. The Owner may or may not, at the discretion of the Owner Purchasing Representative, accept future proposals for the same service or commodities for participants in such collusion.

- 2.37. Gratuities:** The Firm certifies and agrees that no gratuities or kickbacks were paid in connection with this contract, nor were any fees, commissions, gifts or other considerations made contingent upon the award of this contract. If the Firm breaches or violates this warranty, the Owner may, at their discretion, terminate this contract without liability to the Owner.
- 2.38. Performance of the Contract:** The Owner reserves the right to enforce the performance of the contract in any manner prescribed by law or deemed to be in the best interest of the Owner in the event of breach or default of resulting contract award.
- 2.39. Benefit Claims:** The Owner shall not provide to the Offeror any insurance coverage or other benefits, including Worker's Compensation, normally provided by the Owner for its employees.
- 2.40. Default:** The Owner reserves the right to terminate the contract in the event the Firm fails to meet delivery or completion schedules, or otherwise perform in accordance with the accepted proposal. Breach of contract or default authorizes the Owner to purchase like services elsewhere and charge the full increase in cost to the defaulting Offeror.
- 2.41. Multiple Offers:** If said proposer chooses to submit more than one offer, THE ALTERNATE OFFER must be clearly marked "Alternate Proposal". The Owner reserves the right to make award in the best interest of the Owner.
- 2.42. Cooperative Purchasing:** Purchases as a result of this solicitation are primarily for the Owner. Other governmental entities may be extended the opportunity to utilize the resultant contract award with the agreement of the successful provider and the participating agencies. All participating entities will be required to abide by the specifications, terms, conditions and pricings established in this Proposal. The quantities furnished in this proposal document are for only the Owner. It does not include quantities for any other jurisdiction. The Owner will be responsible only for the award for our jurisdiction. Other participating entities will place their own awards on their respective Purchase Orders through their purchasing office or use their purchasing card for purchase/payment as authorized or agreed upon between the provider and the individual entity. The Owner accepts no liability for payment of orders placed by other participating jurisdictions that choose to piggy-back on our solicitation. Orders placed by participating jurisdictions under the terms of this solicitation will indicate their specific delivery and invoicing instructions.
- 2.43. Definitions:**
- 2.43.1. "Offeror" and/or "Proposer" refers to the person or persons legally authorized by the Consultant to make an offer and/or submit a response (fee) proposal in response to the Owner's RFP.
 - 2.43.2. The term "Services" includes all labor, materials, equipment, and/or services necessary to produce the requirements of the Contract Documents.
 - 2.43.3. "Firm" is the person, organization, firm or consultant identified as such in the Agreement and is referred to throughout the Contract Documents. The term Firm means the Firm or his authorized representative. The Firm shall carefully study and compare the Scope of Services, Addenda and Modifications and shall at once report to the Owner any error, inconsistency or omission he may discover. Firm

shall not be liable to the Owner for any damage resulting from such errors, inconsistencies or omissions. The Firm shall not commence services without clarifying Drawings, Specifications, or Interpretations.

- 2.43.4. "Sub-Contractor is a person or organization who has a direct contract with the Firm to perform any of the services at the site. The term Sub-Firm is referred to throughout the contract documents and means a Sub-Contractor or his authorized representative.

- 2.44. Public Disclosure Record:** If the Proposer has knowledge of their employee(s) or sub-proposers having an immediate family relationship with an Owner employee or elected official, the proposer must provide the Purchasing Representative with the name(s) of these individuals. These individuals are required to file an acceptable "Public Disclosure Record", a statement of financial interest, before conducting business with the Owner.

SECTION 3.0: INSURANCE REQUIREMENTS

- 3.1 Insurance Requirements:** The selected Firm agrees to procure and maintain, at its own cost, policy(s) of insurance sufficient to insure against all liability, claims, demands, and other obligations assumed by the Firm pursuant to this Section. Such insurance shall be in addition to any other insurance requirements imposed by this Contract or by law. The Firm shall not be relieved of any liability, claims, demands, or other obligations assumed pursuant to this Section by reason of its failure to procure or maintain insurance in sufficient amounts, durations, or types.

Firm shall procure and maintain and, if applicable, shall cause any Sub-Firm of the Firm to procure and maintain insurance coverage listed below. Such coverage shall be procured and maintained with forms and insurers acceptable to The Owner. All coverage shall be continuously maintained to cover all liability, claims, demands, and other obligations assumed by the Firm pursuant to this Section. In the case of any claims-made policy, the necessary retroactive dates and extended reporting periods shall be procured to maintain such continuous coverage. Minimum coverage limits shall be as indicated below unless specified otherwise in the Special Conditions:

(a) Worker Compensation: Firm shall comply with all State of Colorado Regulations concerning Workers' Compensation insurance coverage.

(b) General Liability insurance with minimum combined single limits of:

ONE MILLION DOLLARS (\$1,000,000) each occurrence and
ONE MILLION DOLLARS (\$1,000,000) per job aggregate.

The policy shall be applicable to all premises, products and completed operations. The policy shall include coverage for bodily injury, broad form property damage (including completed operations), personal injury (including coverage for contractual and employee acts), blanket contractual, products, and completed operations. The policy shall include coverage for explosion, collapse, and underground (XCU) hazards. The policy shall contain a severability of interests provision.

(c) Comprehensive Automobile Liability insurance with minimum combined single limits for bodily injury and property damage of not less than:

ONE MILLION DOLLARS (\$1,000,000) each occurrence and
ONE MILLION DOLLARS (\$1,000,000) aggregate

(d) Professional Liability & Errors and Omissions Insurance policy with a minimum of:

FIVE MILLION DOLLARS (\$5,000,000) per claim

This policy shall provide coverage to protect the Firm against liability incurred as a result of the professional services performed as a result of responding to this Solicitation.

With respect to each of Consultant's owned, hired, or non-owned vehicles assigned to be used in performance of the Services. The policy shall contain a severability of interests provision.

- 3.2 Additional Insured Endorsement:** The policies required by paragraphs (b), and (c) above shall be endorsed to include the Owner and the Owner's officers and employees as additional insureds. Every policy required above shall be primary insurance, and any insurance carried by the Owner, its officers, or its employees, or carried by or provided through any insurance pool of the Owner, shall be excess and not contributory insurance to that provided by Firm. The Firm shall be solely responsible for any deductible losses under any policy required above.

SECTION 4.0: SPECIFICATIONS/SCOPE OF SERVICES

4.1. General/Background:

The City of Grand Junction (City) manages, operates, and maintains the Persigo wastewater collection and treatment system for the benefit of the current and future users of sewer service in the Persigo 201 Service Area.

The WWTP, located at 2145 River Road, was commissioned in 1984. Effluent from the WWTP is discharged to the Colorado River. The Persigo WWTP operates under the Colorado Department of Health and Environment (CDPHE) discharge permit (CO0040053), effective as of January 1, 2018. The facility has a permitted hydraulic capacity of 12.5 million gallons a day (mgd) and an organic capacity of 26,480 pounds per day of biological oxygen demand. Based on CDPHE guidance, utilities are required to initiate master planning and construction activities at 80 percent and 95 percent of permitted capacity, respectively.

The wastewater treatment plant reached 80 percent capacity in 2018. As required by permit, the City began planning for plant expansion upon reaching this capacity milestone. The 2020 Wastewater Treatment Facilities Master Plan was finalized in October 2021. The master plan addresses the following objectives:

1. Align wastewater facilities planning with the City's adopted 2020 Comprehensive Plan.
2. Assess infrastructure needs to meet current and future growth, capacity, and regulatory projections.
3. Provide a 20-year wastewater infrastructure plan that includes asset revitalization and optimization investments needed.

The master plan recommends expanding the wastewater treatment plant in two phases to meet projected population growth for the 201 Service Area and anticipated wastewater flows and loads. Phase 1 Plant Expansion maximizes use of existing infrastructure and provides necessary capacity (13.5 mgd) through the 2040 planning period. Based on anticipated growth projections, it is estimated that the WWTP will reach 95% capacity by 2028 and, therefore, Phase 1 Plant Expansion/Rehabilitation projects will need to be initiated by this time. The City is currently experiencing higher growth rates than the 20-year projected average growth rates. Therefore, the City is planning for plant expansion as early as possible so that adequate capacity is available should these higher growth rates continue in the near term.

The scope of services for the engineering consultant encompasses design of the following planned near-term projects which were prioritized based on criticality to increase operational efficiencies, the need to replace aging assets, and the need to expand available treatment capacity.

- Aeration Basin Asset Revitalization and Blower Building
- Disinfection Operational Improvements
- New Dewatering Building and Solids Storage
- Headworks screening

Aeration Basin Asset Revitalization and Blower Building Project

This project includes a combination of near-term asset replacement projects for the Aeration Building, a new Blower Building, and improved aeration controls. The project scope includes increasing operational reliability by replacing assets that have reached their useful life, improving overall treatment performance, and increasing cost effectiveness of the aeration system. Additionally, by implementing an aeration controls approach, the City should be able to increase secondary treatment capacity and complete a paper re-rating of the Persigo WWTP rated capacity.

Disinfection Operational Improvements Project

This project improves the hydraulic distribution and efficiencies for the existing UV disinfection system. The scope includes purchasing additional UV modules to ensure the existing UV system has appropriate redundancy to meet the current and future service levels.

Dewatering Building and Solids Storage Project

This project includes replacement of the existing dewatering processes with a new Centrifuge Dewatering Building and Solids Storage Facility. The new Centrifuge Dewatering Facility will replace the existing belt filter press dewatering process, which has exceeded its useful life. The new facility will improve operational performance and reliability for the solids dewatering process and decrease the hauling and landfill costs associated with the current biosolids management approach. Biosolids storage has been included to provide operational flexibility when dewatered solids are not transportable to the landfill due to weather conditions.

Headworks Asset Replacements and Hydraulic Improvements Project

This project includes the replacement of aging assets in the Headworks Building and hydraulic improvements to Control Structure No. 1. The equipment allocated for replacement includes step screens, the screening conveyor, grit and screenings washer/compactors, electrical, and controls equipment. Allowances have been included to upgrade, rehabilitate, or replace other components of the facility such as building mechanical, electrical, and structural. Improvements to Control

Structure No. 1 are recommended to eliminate hydraulic bottlenecks, determine hydraulic capacity of the FE basins, and to develop plant flow curves to maximize effectiveness of existing assets.

Appendix H of the Master Plan includes the scope and costing assumptions for each of these projects.

4.2. Special Conditions/Provisions:

4.2.1 Price/Fees: Project pricing shall be all inclusive, to include, but not be limited to: labor, materials, equipment, travel, design, drawings, engineering work, shipping/freight, licenses, permits, fees, etc.

The Owner shall not pay nor be liable for any other additional costs including but not limited to: taxes, shipping charges, insurance, interest, penalties, termination payments, attorney fees, liquidated damages, etc.

Provide a not to exceed cost using Solicitation Response Form found in Section 7, accompanied by a complete list of costs breakdown and rates sheets.

All fees will be considered by the Owner to be negotiable.

4.2.2 Non-Mandatory Site Visit Meeting: Prospective offerors are encouraged to attend a non-mandatory site visit meeting on December 9, 2021 at 11:00am. Meeting location shall be in the Persigo Wastewater Treatment Plant Conference Room, located at 2145 River Road, Grand Junction, CO The purpose of this visit will be to inspect and to clarify the contents of this Request for Proposal (RFP).

4.3. Specifications/Scope of Services:

The scope of services for the professional engineering consultant includes engineering design, permitting, bidding, project management, and construction management services for the following near-term Wastewater Treatment Plant Expansion/Revitalization projects:

- Aeration Basin Asset Revitalization and Blower Building
- Disinfection Operational Improvements
- New Dewatering Building and Solids Storage
- Headworks screening

4.3.1 Engineering Design

Engineering design services include preparing a basis of design for each project, detailed design plans and specifications, and any hydraulic and/or process modeling to support the design. Existing hydraulic and process models developed in support of the Master Plan will be made available to the successful firm.

Surveying - Surveying services should be provided as an optional task. Depending upon workload, surveying services may be provided by the City Surveyor.

Geotechnical - The professional engineering consultant should provide a scope of work for any geotechnical services needed to support design. Geotechnical services will be provided by a geotechnical services firm under separate contract to the City.

Electrical – Engineering design services should include design of electrical systems within the envelope of each of the four wastewater process buildings. In parallel with the four wastewater treatment plant projects, the City will also be replacing the plant-wide electrical distribution loop which includes installing duct banks to replace electrical medium voltage distribution cabling. Electrical engineering services for the electrical distribution loop will be provided by another firm under separate contract to the City. At the 60% design phase, the selected engineering firm for the wastewater treatment plant projects will be responsible for providing electrical demands for the each of the four wastewater treatment projects to serve as the basis for the design of the electrical distribution loop. The selected engineering firm will be responsible for design of low voltage electrical from the medium-voltage transformer to each of the four process areas.

At a minimum, design plans and specifications should be submitted to the City for review at 30, 60, and 90% completion milestones. Issued for construction plans and specifications should be issued that address all review comments. An opinion of probable construction costs (OPCC) and project schedule (including design, permitting, and construction phases) should be included with the 30% design submittal.

Design engineer will also be responsible for developing a maintenance of operation plan in collaboration with the City's operations staff and the CMGC.

4.3.2 Permitting

Permitting services should include documentation and permit applications needed to re-rate the wastewater treatment plant for the additional capacity demonstrated by the design (13.5 mgd). In addition, the consultant should identify any other permits that will be necessary for construction.

4.3.3 Bidding Assistance

The City anticipates utilizing the Construction Manager/General Contractor (CMGC) project delivery method to accelerate project delivery, solicit constructability input during design, identify long lead items, and coordinate project sequencing with operational constraints. The design engineer will assist the City with preparing a request for proposal (RFP) for the CM/GC at the 30% design milestone.

4.3.4 Project Management

Project management should include biweekly progress meetings and monthly progress reports. In addition, the design engineer should be available to participate in workshops with the CMGC at the 30, 60 and 90% milestones to review value engineering concepts, constructability issues, and risk management plans.

An electronic file sharing platform should be established for all project documents.

4.3.5 Design Support during Construction

Design services during construction will include responding to CMGC requests for information (RFIs) regarding design, changed field conditions, and attending construction progress meetings.

Services during construction will also include construction inspection services, as needed depending upon the availability of City staffing resources. The design engineer will provide construction inspection services as needed to supplement city staffing and to provide specialty inspection services. The duration and schedule for construction inspection services will depend upon the construction sequencing schedule developed by the CMGC.

4.4. Timeline: It is expected that the design phase of this work will be completed in approximately eighteen (18) months from date of contract.

4.5. Attached Documents: Click Link
1. [2020 Wastewater Treatment Facility Master Plan](#)

4.6. RFP Tentative Time Schedule:

• Request for Proposal available:	November 22, 2021
• Site Visit meeting (Non-Mandatory) :	December 9, 2021
• Inquiry deadline, no questions after this date:	December 23, 2021
• Addendum Posted:	December 30, 2021
• Submittal deadline for proposals:	January 14, 2022
• Owner evaluation of proposals:	January 17 – 28, 2022
• Interviews	February 10 – 11, 2022
• Final selection:	February 18, 2022
• City Council Approval	March 16, 2022
• Contract execution:	January 19, 2022
• 30% design complete by	August 30, 2022
• 60% design complete by	TBD*
• 90% design complete by	TBD*
• 100% design by	TBD*
• Permitting	TBD*
• Construction (Aeration and Dewatering)	2023-2024
• Construction (Disinfection)	2023
• Construction (Headworks)	2024-2025

* Design phasing will be developed in conjunction with CMGC. Detailed design for all 4 projects may be completed in parallel or sequenced based on construction sequencing schedule.

4.7. Questions Regarding Scope of Services:

Duane Hoff Jr., Senior Buyer
duaneh@gjcity.org

SECTION 5.0: PREPARATION AND SUBMITTAL OF PROPOSALS

Submission: *Each proposal shall be submitted in electronic format only, and only through the Rocky Mountain E-Purchasing website (<https://www.rockymountainbidsystem.com/default.asp>).* *This site offers both “free” and “paying” registration options that allow for full access of the Owner’s documents and for electronic submission of proposals.* (Note: “free” registration may take up to 24 hours to process. Please Plan accordingly.) Please view our “Electronic Vendor Registration Guide” at <http://www.gjcity.org/BidOpenings.aspx> for details. **The uploaded response to this RFP shall be a single PDF document with all required information included.** (Purchasing Representative does not have access or control of the vendor side of RMEPS. If website or other problems arise during response submission, vendor **MUST** contact RMEPS to resolve issue prior to the response deadline **800-835-4603**). For proper comparison and evaluation, the City requests that proposals be formatted as directed in Section 5.0 “Preparation and Submittal of Proposals.” Offerors are required to indicate their interest in this Project, show their specific experience and address their capability to perform the Scope of Services in the Time Schedule as set forth herein. For proper comparison and evaluation, the Owner requires that proposals be formatted **A to F**:

- A. Cover Letter:** Cover letter shall be provided which explains the Firm’s interest in the project. The letter shall contain the name/address/phone number/email of the person who will serve as the firm’s principal contact person with Owner’s Contract Administrator and shall identify individual(s) who will be authorized to make presentations on behalf of the firm. The statement shall bear the signature of the person having proper authority to make formal commitments on behalf of the firm. By submitting a response to this solicitation, the Firm agrees to all requirements herein.
- B. Qualifications/Experience/Credentials:** Proposers shall provide their qualifications for consideration as a professional engineering consultant with experience in the design of wastewater treatment plants.
- C. Strategy and Implementation Plan:** Describe your (the firm’s) interpretation of the Owner’s objectives with regard to this RFP. Describe the proposed strategy and/or plan for achieving the objectives of this RFP. The Firm may utilize a written narrative or any other printed technique to demonstrate their ability to satisfy the Scope of Services. The narrative should describe a logical progression of tasks and efforts starting with the initial steps or tasks to be accomplished and continuing until all proposed tasks are fully described and the RFP objectives are accomplished. Include a **detailed time schedule** for completion of your firm’s implementation plan and an estimate of time commitments from Owner staff.

Specific elements of the strategy and implementation plan shall include: value engineering workshops, CMGC project delivery method, integration of design with existing operational processes, and developing maintenance of operations plans.
- D. References:** A minimum of five (5) **references** that can attest to your experience in projects of similar scope and size. **Please also summarize the projects completed with these references including:** Client Name, Address, Contact Person, Telephone, Email Address, Project Dates, Project Description, etc.
- E. Fee Proposal:** Provide an all-inclusive, not to exceed cost using Solicitation Response Form found in Section 7.0, accompanied by a complete list of costs breakdown.
- F. Additional Data (optional):** Provide any additional information that will aid in evaluation of your qualifications with respect to this project.

SECTION 6.0: EVALUATION CRITERIA AND FACTORS

- 6.1 **Evaluation:** An evaluation team shall review all responses and select the proposal or proposals that best demonstrate the capability in all aspects to perform the scope of services and possess the integrity and reliability that will ensure good faith performance.
- 6.2 **Intent:** Only respondents who meet the qualification criteria will be considered. Therefore, it is imperative that the submitted proposal clearly indicate the firm’s ability to provide the services described herein.

Submittal evaluations will be done in accordance with the criteria and procedure defined herein. The Owner reserves the right to reject any and all portions of proposals and take into consideration past performance. The following parameters will be used to evaluate the submittals **(with weighted values)**:

The following collective criteria shall be worth 90%
<ul style="list-style-type: none">• Responsiveness of Submittal to the RFP (10) (Firm has submitted a proposal that is fully comprehensive, inclusive, and conforms in all respects to the Request for Proposals (RFP) and all of its requirements, including all forms and substance.)• Understanding of the Project and Objectives (30) (Firm’s ability to demonstrate a thorough understanding of the City’s goals pertaining to this specific project.)• Experience (30) (Firm’s proven proficiency in the successful completion of similar projects.)• Strategy & Implementation Plan (20) (Firm has provided a clear interpretation of the City’s objectives in regard to the project, and a fully comprehensive plan to achieve successful completion. See Section 5.0 Item C. – Strategy and Implementation Plan for details.)
The following criteria shall be worth 10%
* Fees (10)

Owner also reserves the right to take into consideration past performance of previous awards/contracts with the Owner of any vendor, Firm, supplier, or service provider in determining final award(s).

The Owner will undertake negotiations with the top-rated firm and will not negotiate with lower rated firms unless negotiations with higher rated firms have been unsuccessful and terminated.

- 6.3 **Oral Interviews:** The Owner reserves the right to invite the most qualified rated proposer(s) to participate in oral interviews, if needed.
- 6.4 **Award:** Firms shall be ranked or disqualified based on the criteria listed in Section 6.2. The Owner reserves the right to consider all of the information submitted and/or oral presentations, if required, in selecting the project Firm.

SECTION 7.0: SOLICITATION RESPONSE FORM**RFP-4972-22-DH Professional Engineering Services Consultant for Wastewater Treatment Expansion Projects**

Offeror must submit entire Form completed, dated and signed.

- 1) **All inclusive, not to exceed cost to provide professional consulting services to include, but not be limited to: engineering design, permitting, bidding, project management, and construction management services, and all other services required for the Wastewater Treatment Plant Expansion/Revitalization projects**

Task	Description	Costs
1	Engineering Design	
2	Permitting	
3	Bidding Assistance	
4	Project Management	
5	Design Support during Construction	
	Construction Inspection	Hourly Rates
	Total Not to Exceed Cost	

NOTE: A detailed breakdown of labor and other direct costs by task should be included.

The Owner reserves the right to accept any portion of the services to be performed at its discretion

The undersigned has thoroughly examined the entire Request for Proposals and therefore submits the proposal and schedule of fees and services attached hereto.

This offer is firm and irrevocable for sixty (60) days after the time and date set for receipt of proposals.

The undersigned Offeror agrees to provide services and products in accordance with the terms and conditions contained in this Request for Proposal and as described in the Offeror's proposal attached hereto; as accepted by the Owner.

Prices in the proposal have not knowingly been disclosed with another provider and will not be prior to award.

- Prices in this proposal have been arrived at independently, without consultation, communication or agreement for the purpose of restricting competition.
- No attempt has been made nor will be to induce any other person or firm to submit a proposal for the purpose of restricting competition.
- The individual signing this proposal certifies they are a legal agent of the offeror, authorized to represent the offeror and is legally responsible for the offer with regard to supporting documentation and prices provided.
- Direct purchases by the City of Grand Junction are tax exempt from Colorado Sales or Use Tax. Tax exempt No. 98-903544. The undersigned certifies that no Federal, State, County or Municipal tax will be added to the above quoted prices.
- City of Grand Junction payment terms shall be Net 30 days.

- Prompt payment discount of _____ percent of the net dollar will be offered to the Owner if the invoice is paid within _____ days after the receipt of the invoice. The Owner reserves the right to consider any such discounts when determining the bid award that are no less than Net 10 days.

RECEIPT OF ADDENDA: the undersigned Firm acknowledges receipt of Addenda to the Solicitation, Specifications, and other Contract Documents. State number of Addenda received: _____

It is the responsibility of the Proposer to ensure all Addenda have been received and acknowledged.

Company Name – (Typed or Printed)

Authorized Agent – (Typed or Printed)

Authorized Agent Signature

Phone Number

Address of Offeror

E-mail Address of Agent

City, State, and Zip Code

Date



Purchasing Division

ADDENDUM NO. 1

DATE: December 16, 2021
FROM: City of Grand Junction Purchasing Division
TO: All Offerors
RE: Professional Engineering Services Consultant for Wastewater Treatment Plant Expansion Projects RFP-4972-22-DH

Offerors responding to the above referenced solicitation are hereby instructed that the requirements have been clarified, modified, superseded and supplemented as to this date as hereinafter described.

Please make note of the following clarifications:

1. Q. Can we get a copy of the process model for the facility and hydraulics model?
 - A. Yes, the process model is attached ([Click Link here](#)). The hydraulic model is already included in the masterplan.
2. Q. Are mix liquor pumps, RAS, WAS pumps required for the project?
 - A. No, the RAS and WAS pumps are not planned to be replaced or modified as part of this project. We currently do not have a traditional mixed liquor pump configuration. The east basin has a through-wall pump as part of the anoxic zone configuration which brings back nitrified mixed liquor to the head of the unaerated basin. The west basins do not have any through-wall or mixed liquor pumps. As part of this project, we would like to have all aeration basins be configured the same for nite/denite. This would inherently involve work/modifications to the "mixed liquor" conveyance system on more or basins.
3. Q. Are grit basins being replaced?
 - A. No, the grit basins are not being replaced.
4. Q. Can you please provide structural assessment report?
 - A. Yes, attached ([Click Link here](#)).
5. Q. What about communications to the new buildings?
 - A. This project should assume radio telemetry to the existing SCADA network. The radio telemetry will be upgraded to a fiber optic network in the next 5-10 years. So if there are

any design or construction considerations needed for the eventually migration to a fiber optic network please include in this project.

6. Q. For permitting, is this c-one site application?

A. Yes, that is our assumption.

7. Q. EOPC and costing, is this to be done by Engineering Firm, or CMGC?

A. Engineering firm.

8. Q. Any SRF or Federal Funding for the project?

A. At this point, we plan to cash fund the project however, we are interested in considering other funding options should there be an advantage.

9. Q. For all permitting, will the City, or the selected Engineering Firm, be responsible to provide and coordinate?

A. The selected firm provide and coordinate all permitting with minor assistance and review from City staff.

10.Q. How much architectural for aesthetics vs. functionality is the City expecting for the level of effort from the selected Engineering Firm?

A. The primary effort of architectural should be focused on functionality.

11. The estimated Contract Date is March 17, 2022.

12. The estimated, all inclusive, project budget is \$41.8M. The estimate for the aeration basin component is \$16.2M, dewatering building is \$19.3M and the headworks is \$6.3M.

The original solicitation for the project noted above is amended as noted.

All other conditions of subject remain the same.

Respectfully,

A handwritten signature in black ink, appearing to read 'Duane Hoff Jr.', written over a horizontal line.

Duane Hoff Jr., Senior Buyer
City of Grand Junction, Colorado



Purchasing Division

ADDENDUM NO. 2

DATE: December 22, 2021
FROM: City of Grand Junction Purchasing Division
TO: All Offerors
RE: Professional Engineering Services Consultant for Wastewater Treatment Plant Expansion Projects RFP-4972-22-DH

Offerors responding to the above referenced solicitation are hereby instructed that the requirements have been clarified, modified, superseded and supplemented as to this date as hereinafter described.

Please make note of the following clarifications:

1. Q. I noticed that the December 16th Addendum provides a link to the wastewater plant's process model, but the link actually directs to the WJE Geotechnical Report. I checked the other link on the addendum and it correctly references and directs to the WJE structural condition assessment report. The process model appears to be unavailable currently.

A. Please see attached link ([Click here](#)). This is being provided in its native format in Biowin (.bwc)

The original solicitation for the project noted above is amended as noted.

All other conditions of subject remain the same.

Respectfully,

A handwritten signature in black ink, appearing to read "Duane Hoff Jr.", written over a horizontal line.

Duane Hoff Jr., Senior Buyer
City of Grand Junction, Colorado



Purchasing Division

ADDENDUM NO. 3

DATE: December 27, 2021
FROM: City of Grand Junction Purchasing Division
TO: All Offerors
RE: Professional Engineering Services Consultant for Wastewater Treatment Plant Expansion Projects RFP-4972-22-DH

Offerors responding to the above referenced solicitation are hereby instructed that the requirements have been clarified, modified, superseded and supplemented as to this date as hereinafter described.

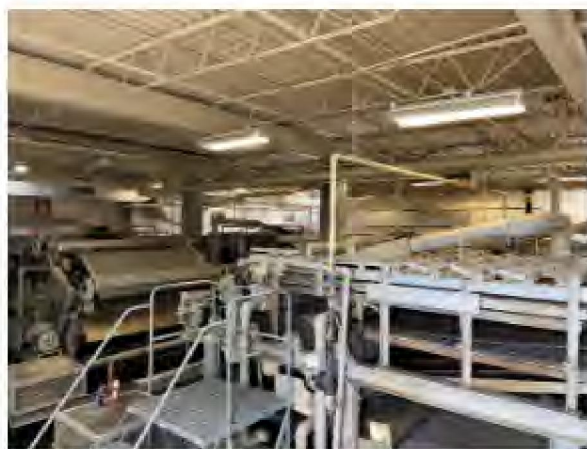
Please make note of the following clarifications:

1. Q. How much, if any, of the structural repairs recommended in the WJE 2020 report for the existing dewatering building does the City want to include as part of this project? The RFP states that a new dewatering/centrifuge building should be constructed and does not mention structural repairs to existing structures, however, the Carollo 2021 Master Plan referenced in the RFP does indicate a desire for rehabilitation of this existing structure. Please advise on what level of repairs to the existing dewatering building should be completed as part of this project.

4.7.1 Dewatering Facility Asset Revitalization Projects

The asset replacement projects associated with the Dewatering Treatment Process includes:

- Replace the belt filter presses.
- Replace the sludge feed pumps.
- Building mechanical improvements are needed to improve the ventilation systems.
- Replace the MCCs and associated electrical systems to meet current code and safety requirements and recommendations.
- Upgrade the existing PLCs and I&C.
- Incorporate the structural modifications include allowances in the *Persigo Wastewater Treatment Plant Structural Condition Assessment (WJE, 2020)*.



Dewatering Facility.

A. We do not intend to repair or rehabilitate the existing dewatering building once the new facilities are constructed. The decision to demo the existing building versus repurpose for storage, etc. vs. abandon in place has not been made. For the purposes of this solicitation process, engineering design services for the determination of this abandoned facility will not be a part of, or included, in this project.

The original solicitation for the project noted above is amended as noted.

All other conditions of subject remain the same.

Respectfully,

A handwritten signature in black ink, appearing to read 'Duane Hoff Jr.', written in a cursive style.

Duane Hoff Jr., Senior Buyer
City of Grand Junction, Colorado



Purchasing Division

ADDENDUM NO. 4

DATE: December 30, 2021
FROM: City of Grand Junction Purchasing Division
TO: All Offerors
RE: Professional Engineering Services Consultant for Wastewater Treatment Plant Expansion Projects RFP-4972-22-DH

Offerors responding to the above referenced solicitation are hereby instructed that the requirements have been clarified, modified, superseded and supplemented as to this date as hereinafter described.

Please make note of the following clarifications:

1. Q. The RFP and Master Plan scope of work for Disinfection Operational Improvements Project only includes purchasing additional UV modules to serve as spares to the existing UV modules. The scope and budget for this Project in the Master Plan does not include adding a second UV channel. During the site walk at the Site Visit meeting, it was stated by the City that the project would include adding a second UV channel. Should the Engineer include the design of the second UV channel in their scope and fee?

A. Yes, please include the design of the second UV channel in your scope and fee.
2. Q. The RFP doesn't mention installing a building or canopy over the UV system, but this was discussed as a project need during the site walk. Should the Engineer include in our design fee a new building, and if so what type of building should we assume (example: canopy, PEMB, etc.).

A. Yes, please include in the scope and design to install an enclosure around the UV systems. We are interested in a practical and low cost solution such as a pre-engineered metal building or canopy. We'd like the selected firm to recommend what type of enclosure is most applicable.
3. Q. Addendum No. 1 – Response to Question 12 doesn't include a cost for the UV improvements. Please Include the project's UV budget.

A. As noted above, the masterplan didn't specify the design of the second UV channel or to add an enclosure around UV. For this reason we don't have an estimated cost for the UV improvements.

4. Q. The RFP and Master Plan scope of work for Dewatering Building and Solids Storage Project including the budget in Appendix H does not include a sludge blending tank. During the site walk at the Site Visit meeting, it was stated by the City that the project would include a new sludge blending tank. Should the Engineer include the design of the sludge blending tank in their scope and Fee?

A. Yes, please include the design of the sludge blending tank in your scope and fee.

The original solicitation for the project noted above is amended as noted.

All other conditions of subject remain the same.

Respectfully,

A handwritten signature in black ink, appearing to read 'Duane Hoff Jr.', written in a cursive style.

Duane Hoff Jr., Senior Buyer
City of Grand Junction, Colorado



PROPOSAL FOR
**PROFESSIONAL ENGINEERING SERVICES
CONSULTANT FOR WASTEWATER
TREATMENT PLANT EXPANSION PROJECTS**

SUBMITTED TO
CITY OF GRAND JUNCTION
RFP# **4972-22-DH**
JANUARY 14, 2022

A. COVER LETTER

A. Cover Letter

January 14, 2022

City of Grand Junction
Duane Hoff Jr., Senior Buyer
duaneh@gjcity.org

RE: Proposal for Professional Engineering Services Consultant for Wastewater Treatment Plant Expansion Projects, RFP-4972-22-DH

Dear Mr. Hoff:

The City of Grand Junction (City) is proactively upgrading and expanding the Persigo Wastewater Treatment Plant so that it will continue to serve the community's wastewater needs for many years to come. Having completed numerous Colorado wastewater treatment facility retrofits in the last 10 years, the Burns & McDonnell team is ready to put our experience to work for you.

Why Select Our Team?



We Are a Collaborative Partner. With more than \$600M in recent Rocky Mountain region collaborative delivery experience (including CMAR/CMGC) Burns & McDonnell understands the importance each project phase has in developing a project delivery plan that is achievable, executable, and ultimately successful in meeting your needs. Our ability to partner with the selected contractor and the owner's stakeholders and facility operators has been key to the success of these projects.



The Right Team & Experience. Our proposed project team is Denver based and has worked together extensively on previous projects. Key recent wastewater treatment CMAR projects in Colorado completed by our proposed project team include the Stonegate Village Metropolitan District WWTP Upgrades, Boxelder Sanitation District WWTP Upgrades Project 1, Boxelder Sanitation District WWTP Upgrades Project 2, and the Plum Creek Water Reclamation Authority WWTP Expansion. Greg Woodward, project manager, has more than 15 years of experience working at the Persigo WWTP, and brings his detailed knowledge of your facility to the projects at hand.



We Specialize in Retrofit Designs. Your project requires the type of specialized retrofit experience that our team has gained over years of design and construction in existing facilities. Keeping your WWTP operational while upgrades take place is critical. Using a detailed manual of permitted operations (MOPO), we know how to do it right. We develop innovative and cost-effective solutions that maximize your budget and infrastructure, while providing accessible and operator friendly designs.

RFP Acknowledgement: Burns & McDonnell acknowledges that the submission of a proposal in response to this RFP is a binding offer.

We are looking forward to helping you with this important project. Please reach out to our designated contact, Greg, by phone at (720) 657-2841 or via email at gjwoodward@burnsmcd.com with any questions

Best regards,

Greg Woodward, PE | Project Manager

Daniel Korinek, PE | Vice President

CONTENTS

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Attachment 1. Resumes

B. QUALIFICATIONS/ EXPERIENCE/CREDENTIALS

B. Qualifications/Experience/Credentials

Who We Are

Burns & McDonnell is a fully integrated engineering and consulting firm with a multidiscipline staff. We are 100% employee owned, which means we are relationship-focused and dedicated to making our clients successful. We have a 90 percent repeat-business rate and client partnerships that span multiple decades.

Local Office & Team

We will support the City of Grand Junction's project from our Centennial, CO office location. This office is home to 320 design, construction, and environmental resources, 45 of which are dedicated exclusively to water and wastewater projects. Our key personnel live here, work here, and are committed to working with you in partnership. We don't just work on a few projects here and there in Colorado; most of our team's experience is right here in Colorado along the Front Range.

Full-Service Wastewater Services

We plan, design, and construct projects of all sizes, ranging from small facility upgrades, to complex facility retrofits, to greenfield treatment facilities.

Our team specializes in retrofit design and construction, including process optimization. **We know how to do it right because more than 75% of our major plant designs in the last 10 years are retrofits.** These types of projects include a variety of challenges when it is necessary to maintain existing hydraulic grades and work within existing treatment basins.

60 Locations

7,600 Staff Firmwide

320 Staff in CO

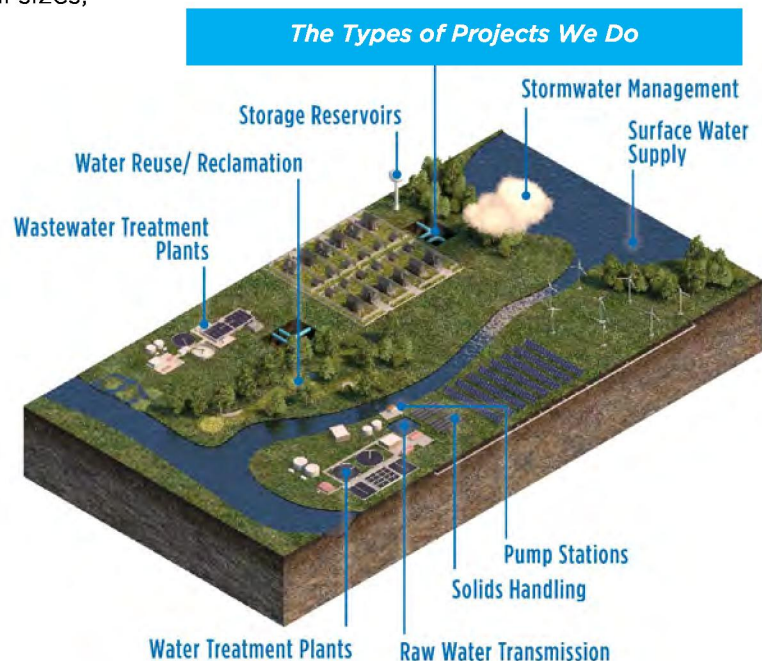
45 CO Staff Dedicated to Water & Wastewater Projects

#4 in Top Design Firms, Mountain States*

#9 in Top 500 Design Firms*

#9 in Wastewater Treatment*

**Rankings are from Engineering News-Record, 2021*



Designed to Build

Burns & McDonnell is not just an engineering firm; we are a full-service construction firm. The City will benefit from our experience as a “design-builder” when it comes to planning and estimating costs for your project, helping you weigh your options, and designing retrofits that makes sense from a construction standpoint.

Burns & McDonnell’s design engineers and project managers have extensive, firsthand experience in the field observing construction, whether our scope of work is engineering only, or if we are part of a CMAR team. Simply put, this experience makes our designs better. Our design teams stay engaged with projects from planning through construction completion. They work closely with our in-house construction team, as well as local contractors, in design-build, construction manager at risk (CMAR), and other collaborative settings.

In House Cost Estimating

When it comes to cost estimating, our nationwide and local construction experience will benefit your project. We will combine our understanding of market conditions, leverage our supplier and subcontractor relationships for pricing and constructability, take advantage of our captured cost history, and communicate this information in a timely and meaningful way to the project team. Our ability to clearly define work for contractors minimizes surprises on bid day and allows us to work your budget to meet the project goals.

Our in-house estimators do not rely on cost tools or models available on the market to estimate costs for wastewater projects; we use ground up estimates informed by local market data.

2 Billion +
Annual construction revenue

52%
Annual revenue from
construction services

300
In-House Cost Estimators

1,100
In-house construction
resources

#6 in Top 100
Design-Build Firms*

Engineering News-Record, 2021



Your Project Manager



Greg Woodward PE

Greg has more than 30 years of experience in wastewater treatment, serving as a project manager, delivery manager, lead engineer, technical lead, and quality reviewer. **He brings unique and valuable insights to your project, having managed and designed numerous projects at the Persigo WWTP over a period of 18 years.** He is extremely familiar with the facility's layout, its historical operations, and challenges, having managed the planning, design, and construction of a dozen projects at the facility. Throughout the development of the design concepts and final contract documentation, Greg worked closely with plant staff to understand current challenges, desired operational flexibility and maintaining project budgets.

Key Projects at the Persigo WWTP

▶ UV Disinfection *	▶ Plant Upgrade Study	▶ BNR Full Scale Pilot Study
▶ Headworks Improvement *	▶ Solids Digestion Master Planning and Facility	▶ Secondary Clarifier Addition
▶ Aeration Basin Improvements Piloting*	▶ Improvements Diffuser Outfall Upgrade	▶ Composting Piloting
▶ Primary Anaerobic Digester Cover Improvements	▶ Nutrient Study	▶ Dissolved Air Flotation Thickening

* Denotes projects that are part of the planning and design for current project

Value Added Insights

Greg's history with the Persigo WWTP provides a solid foundation to work from in the development of the institutional knowledge to be incorporated into the planning and design. Greg's management approach will focus on incorporating details of the City's needs and wants, for each project, while maintaining the vision for the City's long-range plans for the WWTP. Bringing his historical knowledge to this project will be of high value to the City. In addition to work at the Persigo WWTP, Greg has completed several other projects incorporating each of the four scope elements of this project.

Key Design Experience Areas

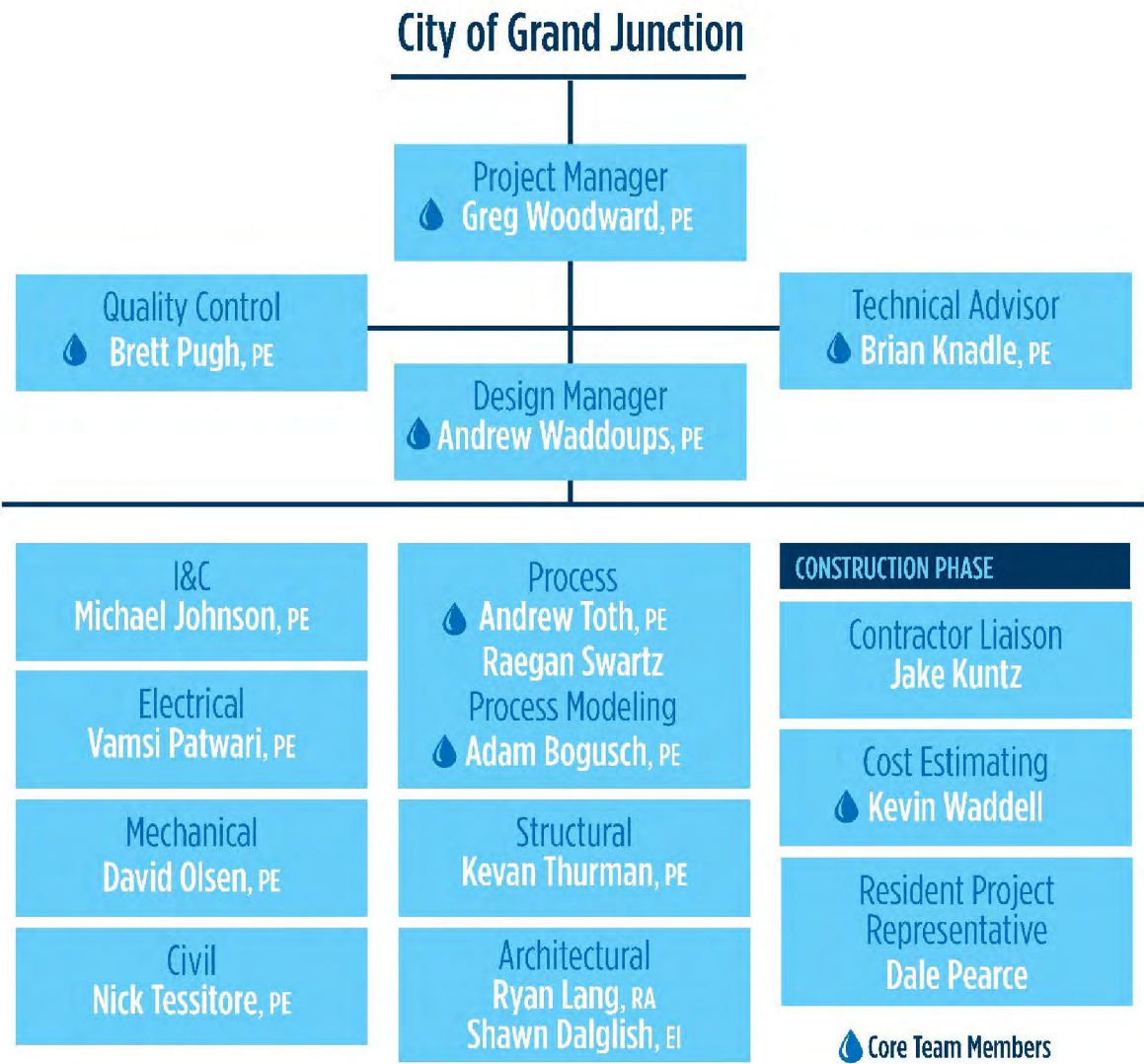
Dewatering	Headworks
<ul style="list-style-type: none"> ▶ Fremont Sanitation District, CO Solids Handling Facility (Centrifuges) ▶ Mt. Crested Butte Water & Sanitation District, CO WWTP Expansion & and Joint Sludge Authority ATAD System (Centrifuges) ▶ City of Woodland Park, CO WWTP Expansion (Centrifuges) ▶ Town of Bayfield, CO WWTP Improvements (Belt Press) ▶ Metro Wastewater Reclamation District: Polymer Feed System Improvements (Chemical Feed System: Dry & Liquid) 	<ul style="list-style-type: none"> ▶ Fremont Sanitation District, CO Headworks Modifications ▶ City of Toronto, Ontario, CA WWTP Headworks & Odor Improvements ▶ City of Calgary, Alberta, CA Bonnybrook WWTP Headworks Upgrade ▶ Town of Bayfield, CO WWTP Improvements ▶ South Platte Renew, CO Headworks Pumping Improvements Projects ▶ Springfield Southwest WWTP, MO Headworks Improvement Eval. ▶ City of Brush, CO WWTP Expansion
UV Disinfection	Aeration Basin / Blower Systems
<ul style="list-style-type: none"> ▶ South Platte Renew, CO UV Disinfection Evaluation (Prelim. Work) ▶ Mt. Crested Butte Water & Sanitation District, CO UV Improvements ▶ Fremont Sanitation District, CO UV Disinfection Design ▶ Town of Morrison, CO Morrison Water Reclamation Facility ▶ Town of Bayfield, CO WWTP Improvements ▶ Town of Telluride, CO UV Disinfection Improvements ▶ Town of Crested Butte, CO WWTP Improvements 	<ul style="list-style-type: none"> ▶ Fremont Sanitation District, CO Blower System Improvements ▶ Springfield Southwest WWTP, MO Aeration Basin Mixing Improv, ▶ Mt. Crested Butte Water & Sanitation District, CO WWTP Expansion ▶ Town of Bayfield, CO WWTP Improvements ▶ Town of Morrison, CO Morrison Water Reclamation Facility ▶ Town of Telluride, CO UV Disinfection Improvements ▶ City of Brush, CO WWTP Expansion

Your Project Team

Burns & McDonnell provides small business service combined with large firm resources. We know that project team consistency is a major factor that contributes to a project's success. The core project team you see in our organization chart is Colorado based and is the team that will be executing your project.

Resumes for all team members are provided in Attachment 1.

This project team has worked together on 10 major WWTP retrofits in Colorado & this region in the last 5 years.



Key Project Team Members



Andrew Waddoups PE | Design Manager

Andrew has 26 years of experience in wastewater treatment facility optimization, permitting, design, and construction. His design background includes a variety of custom solutions developed for new treatment facilities and complex retrofits and expansions, using traditional and collaborative delivery methods. Andrew partners with client stakeholders to understand key project drivers to develop realistic and cost-effective designs, and partners with facility operators to design facilities that meet their needs.

Key Project Experience

Client Role Project	Project's Relevance to Grand Junction
South Adams County Water & Sanitation District, CO Project Manager, BNR Upgrades at WWTP	New splitter structure, aeration basins, D.O. controlled blower/aeration system, UV disinfection
City & County of Broomfield, CO Project Manager, BNR Enhancements Project at WRF	Aeration basin upgrades and replacement of multi-stage blowers with mag-lev turbo blowers and automated control



Brian Knadle PE | Technical Advisor

Brian has 13 years of experience as a senior process design engineer, treatment specialist, project manager, and quality reviewer for major wastewater treatment facility retrofits and new plants, using both traditional and collaborative project delivery methods. He has extensive experience in treatment process selection, hydraulic evaluations, and plant optimization.

Key Project Experience

Client Role Project	Project's Relevance to Grand Junction
City of Pierre, SD Project Manager, WWTP Upgrades	Blowers & automated aeration, hydraulic evaluation and multiple splitter structures, solids dewatering, headworks retrofit with screening and grit removal systems
Plum Creek Water Reclamation Authority, CO Project Manager, WWTP Upgrades	CMAR, blowers & automated aeration, hydraulic evaluation and multiple splitter structures, headworks retrofit with screening and grit removal systems
City of Emporia, KS Project Manager, WWTP Upgrades	Design-Build, Blowers & automated aeration, hydraulic evaluation and multiple splitter structures, flow equalization improvements, headworks retrofit with screening and grit removal systems



Brett Pugh PE | Quality Control

Brett has 23 years of experience in wastewater treatment facility design, construction, and startup experience. He has been actively involved with collaborative project delivery (design-build, CMGC, and CMAR) for more than 20 years.

Key Project Experience

Client Role Project	Project's Relevance to Grand Junction
City of Grand Junction, CO Project Manager, Water Supply Options Assessment	Familiar with City preferences, workflow, and infrastructure
Boxelder Sanitation District, CO Project Manager, Boxelder WWTP Expansion	CMAR, blowers & automated aeration, headworks expansion with screening and grit removal systems, hydraulic evaluation and multiple splitter structures, solids dewatering, secondary treatment expansion



Adam Bogusch PE | Process Modeling

Adam has more than 26 years of design and process modeling experience on water, wastewater, and environmental treatment projects. His process skills include BioWin and Plan-It Stoa process models and he is skilled at hydraulic evaluations. Adam has been involved in several innovative projects using advanced treatment technologies and various bio-nutrient removal approaches.

Key Project Experience

Client Role Project	Project's Relevance to Grand Junction
City of Hays, KS Project Engineer, WWTP Upgrades	Design-build, BioWin process modeling, blowers and automated aeration, digestion and centrifuge dewatering, headworks screening and grit removal systems, UV disinfection
Cherokee Metropolitan District, CO Project Engineer, WRF TDS Reduction	BioWin process modeling, biological treatment system process design, blowers, and automated aeration
City of Hutchinson, KS Project Manager, WWTP Upgrades	Design-build, blower and automated aeration system upgrades, hydraulic evaluation with plant flow diversion structure installation/modification, screw pump to submersible pump conversion, UV disinfection upgrades



Andrew Toth PE | Process Engineer (Lead)

Andrew has seven years of experience in municipal and industrial wastewater design. He has served as the lead process engineer on recent municipal wastewater treatment facility expansions and retrofits for clients such as Plum Creek Water Reclamation Authority, City of Fort Lupton, Boxelder Sanitation District, and City of Pierre.

Key Project Experience

Client Project	Project's Relevance to Grand Junction
Plum Creek Water Reclamation Authority, CO Lead Process Engineer, WWTP Upgrades	CMAR, Blowers & automated aeration, hydraulic evaluation and multiple splitter structures, headworks retrofit with screening and grit removal systems
Boxelder Sanitation District, CO Lead Process Engineer, Boxelder WWTP Expansion	CMAR, Blowers & automated aeration, headworks expansion with screening and grit removal systems, Hydraulic evaluation and multiple splitter structures, solids dewatering, secondary treatment expansion



Kevin Waddell | Cost Estimating

Kevin serves as Burns & McDonnell's lead construction estimator for water and wastewater projects, specializing in conceptual estimating (less than 30% design completion) used for both budget establishment and early GMP development. Kevin brings more than 26 years of experience working as a lead estimator and preconstruction manager for self-perform construction companies in the water & wastewater industry.

Key Project Experience

Client Project	Project's Relevance to Grand Junction
Cherokee Metropolitan District, CO Cost Estimator, TDS Reduction at Cherokee WRF	Construction estimating and constructability reviews
City of Fort Lupton, Colorado Cost Estimator, Fort Lupton WWTP Improvements	Construction estimating and constructability reviews

Collaborative Delivery Experience: Working in the Best Interest of Your Project. Always.

Our approach to design is centered on being a collaborative partner with all parties – client leadership and operators, contractor, and stakeholders – to deliver facilities that meet your needs for many years to come. Below is a select list of treatment facility projects our team completed using collaborative delivery methods.

Collaborative Delivery Experience at Local Treatment Facilities <i>DB = Design-Build CMAR = Construction Manager at Risk</i>	Construction Complete (Year)	Size (MGD)	Delivery Method	Constructed Value (Approx. \$)	Colorado Project	Expansion or Retrofit	Headworks	Blower and Automated Aeration	Solids Dewatering	UV
Cherokee Metro District (CO) WRF TDS Reduction	2023	4.8	DB	\$42M	•	•	•	•		
Boxelder San. District (CO) WWTP Expansion	2021	4.6	CMAR	\$34M	•	•	•	•	•	•
Stonegate (CO) WWTP Upgrades	2014	1.1	CMAR	\$12M	•	•	•	•	•	•
PCWRA (CO) Plum Creek WRF Expansion	2021	9.5	CMAR	\$32M	•	•	•	•		•
Erie (CO) North WRF Capacity Increase	2017	3.5	DB	\$3.2M	•	•		•		•
Erie (CO) North Water Reclamation Facility	2011	1.95	DB	\$19.9M	•		•	•	•	•
Boxelder San. District (CO) WWTP	2014	3.0	CMAR	\$8.7M	•	•	•	•		•
Fairplay San. District (CO) WWTP	2009	0.3	DB	\$4.9M	•	•	•	•		•
Emporia (KS) WWTP Expansion	2019	3.8	DB	\$28.6M		•	•	•		•
Brighton (CO) WWTP Expansion	2005	3.0	DB	\$4.1M	•	•				
Montrose (CO) WWTP Expansion	2008	5.0	DB	\$3.3M	•	•				
Riverton (WY) Solids Dewatering Facility Upgrade	2008	5.0	DB	\$3.9M		•			•	
Cave Creek (AZ) WWTP	2010	1.0	DB	\$26.6M			•	•	•	

20
Major WWTP
Projects in
Colorado &
Wyoming

\$650 million
in Completed
Collaborative
Delivery Water
& Wastewater
Projects

85
Water & Wastewater
Projects Completed
Using Collaborative
Delivery

C. STRATEGY & IMPLEMENTATION PLAN

C. Strategy & Implementation Plan

Owner's Objectives

The Persigo WWTP is nearing its permitted design capacity and needs capacity and modernization improvements. The City created a Master Plan to provide guidance for the improvements to the treatment facility. The first phase of projects is designed to increase the design capacity to 13.5 MGD and modernize specific process units to allow the facility to operate through 2040.

The City is seeking an engineer and contractor to complete specific facility projects using a collaborative delivery approach that provides operational safety/compliance during construction, transparency of cost factors, and a team that can work hand-in-hand with the City. The facility upgrades will include modernization of equipment to improve process control and reduce energy usage. The selected team should have strong collaborative delivery experience, verifiable retrofit experience, and deep process design experience to simplify and improve operational control. Burns & McDonnell is that team.

Through the development of the Master Plan, the goals that were used as the basis for development of alternatives, and the measurement of adherence to these goals, were as follows:

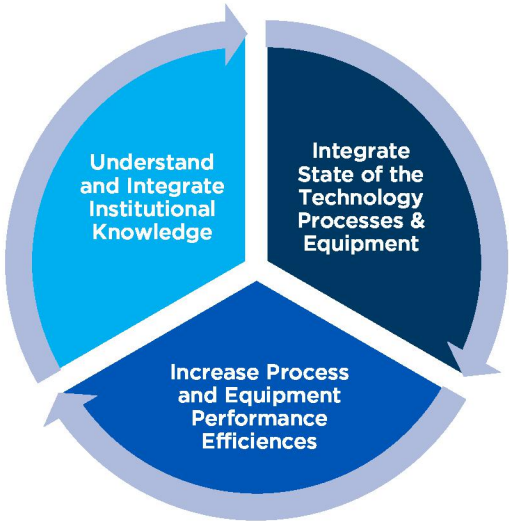
 Meeting the Master Plan Goals	1	Meet Current Service Needs While Establishing a Basis for Future Flows
	2	Consider Resource Recovery and Implement Where Appropriate
	3	Manage Risk Through Evaluating System Service Life
	4	Protecting Health and Safety of Staff and Community
	5	Protection Of the Environment in All Forms; Air, Land & Water
	6	Increase Operational and Consumed Energy Efficiencies
	7	Drive Innovation for Management, Operations and Maintenance
	8	Demonstrate Fiscal Responsibility

Critical Objectives

Our overarching strategy as we work through the development of the alternatives and define design concepts for each of the four design packages will be to

- 1) Emphasize the understanding and integration of your current institutional knowledge,
- 2) Integrate state of the technology equipment, and
- 3) Increase performance and efficiencies of the equipment and processes selected.

Each of these individual strategies are discussed below:



Strategy: Integration of Institutional Knowledge

The institutional knowledge that the City's staff bring to this project is extremely valuable. This knowledge base began with being part of the final construction activities in the 1980s, to shepherding startup and commissioning, and having operated the treatment facility as the community has grown. [Our project manager, Greg Woodward will be able to compliment this knowledge base having been a key member of most of the rehabilitation and pilot projects completed in the past 14 years.](#)

If ever there was potential to learn from what equates to 300+ years of operator knowledge working at a treatment facility and knowing it like the back of your hand, this is the opportunity! One of our objectives will be to create an environment during our project meetings that is a true platform for sharing and discussing day to day operator activities and personnel limitations, and those pinch points in the process that are either physical or functional. Understanding these elements helps us all make better, fully informed decisions.

Our scope to fulfill this strategy will begin with the project kickoff meeting. The format of the meetings and workshops we hold will use a proven a method to understand, extract, refine and apply your staff's institutional knowledge. In turn, this will translate into a highly effective design for each of the four packages.

Burns & McDonnell emphasizes this objective in our projects, knowing that your staff are the key to understanding the facility's daily challenges. We will host meetings where we discuss topics, create hypothetical situations that help us define operational needs, and characterize equipment functional requirements.

We have successfully used this approach on projects like yours. The Pierre, South Dakota WWTP Expansion is a great example. The WWTP expansion required both changes to meet current and future effluent criteria as well as much needed and significantly delayed infrastructure maintenance and improvements. Our team worked with staff initially using questionnaires and technical workshops for each individual process to develop the basic historical knowledge of operating conditions (good and bad), operational needs and desires associated with new infrastructure and equipment.

The questionnaire and technical workshop approach will be outlined in more detail in our plan discussed below. This information helps formulate our initial evaluation of system components and will drive the concept design development.

Questionnaires

The existing facility operations will play an important role in how upgrades are incorporated into the future design. It is important to understand the perspective of the operators and their preferred method of operations and make sure their voice is heard on current operational issues they are experiencing. We will get input from the operations staff to assist with identifying key issues at the existing plant so that the new processes are easily incorporated into the overall operations plan.

Our operator questionnaire and workshops will provide an interactive forum for this to take place. The "hands on" information shared at these workshops, along with the administrative and technical staff information, will provide what is needed to complete a successful project. The questionnaires are a starting point for the City to discuss their needs and to provide Burns & McDonnell a better understanding of those needs. They are not meant to be a "catch all" but to provide a solid foundation for sharing the operational and institutional knowledge of each specific area.





Example UV Operator Questionnaire (and Answers)

1. **Please indicate what type of channel covers Plum Creek would prefer? (checkered plate, grating, grating with rubber mats, FRP grating vs. metal grating, etc.)**
 Answer: We prefer aluminum grating with rubber mats over the channels. The rubber mats keep the UV light and humidity in the channels but allow us to roll them up and see the channels.
2. **Burns & McDonnell is planning to reuse the existing plumbing. Are there any additional plumbing items that need to be addressed? (drains, hose bibs, etc.)**
 Answer: Existing plumbing is adequate in the UV building but please add a hose bib on the northeast side of the building for washdown when we are taking samples.
3. **Please list any other maintenance issues that you consider to be the most time consuming in the UV building that potentially could be addressed with the upgrades.**
 Answer: The deep channels provide issues when trying to maintain the bulbs. Please provide a way for easier bulb access.
4. **Burns & McDonnell typically sets up the UV system for remote ethernet monitoring only and local control. Is this acceptable?**
 Answer: Yes, this is acceptable. I want our operators to be able to visually see the UV system alarms but have to go out to the system to make any changes to the system.



RESULTS: Following this approach, all the design decisions noted were reviewed / approved by the project stakeholders, conveyed to the discipline engineers, and incorporated into the design.

Workshops

Technical workshops will be hosted throughout the initial design phases of the project and focus on topics such as design ideas, lessons learned, process equipment and tours, operations & maintenance considerations, 3D model considerations, costs estimating, etc. This hands-on approach is a key step in identifying your preferences prior to developing preliminary designs and layouts. The figure on the next page shows example areas that the workshops will focus on.

Once our team has received owner and operator input from the workshops and questionnaires, this will allow us to proceed with the alternatives/concept design with a solid foundation. This entails going through a series of steps to land at a selected path forward that falls within your budget and aligns with the future operations at the facility.

Example of 3D model workshop with Plum Creek Water Reclamation Authority



Strategy: State of the Technology Equipment Selection & Integration

The Persigo Wastewater Treatment Plant commissioned in the 1980s has functionally met the needs of the facility's effluent criteria and has done so with an as needed approach to process improvements or equipment and infrastructure improvements. Recently, the City added a system to collect, clean and compress natural gas collected from the anaerobic digesters that now is an alternative fuel source for the City's fleet vehicles. This is a prime example of developing specific approaches in the evaluation, selection and design of technologies that improve operations and keep the facility current with technology.

Our scope objective will be to integrate our experience and use of new technologies into our workshops where we will provide City staff with these concepts, accompanied with pros and cons to each system. We will include such items as shown to the right in addition to other characteristics develop in workshops with staff.

The intent will be to provide the City with options that are advancing the technology status of the Persigo WWTP in a manner that provides the best response to those characteristics developed by staff at the treatment facility.

This approach has proven quite effective in our work with the Cherokee Metropolitan District on their TDS Reduction Project at the Cherokee Water Reclamation Facility. The District was faced with a water quality influenced discharge permit that accounts for a discharge point that is a direct tributary to a surface influenced groundwater source for their own and neighboring communities. Not only did the discharge permit require regulatory elements of meeting strict Total Nitrogen and Total Phosphorous, but also required the system to meet a Total Dissolved Solids limit. These discharge limits are not typical, and as such we posed state of the art processes in combination that would meet their criteria. These options included:



1. Sequencing Batch Reactor (SBR), Flow Equalization with sidestream bag or sand filters, Ultrafiltration, Reverse Osmosis with brine to deep well, then blend back through UV
2. SBRs converted to bioreactors, Membrane Bioreactors, sidestream high-rate recovery Reverse Osmosis with evaporation ponds, then blend back through EQ and UV

Each of these alternatives was developed using the existing infrastructure to support the overall approach, provide redundancy and operational flexibility, and integrated state of the art technology into a process scheme that met the proposed process needs. This system is not simple, but with our assistance, the District's staff has become comfortable in its operation.

Equipment Workshop Evaluation Characteristics

- ✓ Operational Performance
- ✓ Operational History
- ✓ Capital and Operational Costs
- ✓ Flexibility of Use
- ✓ Manufacturer Origin and Parts Availability
- ✓ Service Technician Availability
- ✓ Service Technician Location

Strategy: Net Positive Impacts

The objective we have for this strategy is to identify, incorporate and implement a Net Positive Impact to each aspect of the four projects design and operations. We will use a metric of Reduction in Carbon Footprint as the basis for these discussions and determinations.

Better Technology: The first scope element is a direct impact of selecting equipment that has better efficiencies to that equipment that is currently installed. These increases will focus on the selection of pumps, blowers, motors, drives or the like that due to newer technologies will have better operating efficiencies.

Operational Efficiencies: The second element of the direct impacts is that of operational efficiencies. This would be the selection of equipment that support a direct benefit to the process being evaluated. Such as when we are looking at the sizing and selection of the new dewatering equipment. Selecting the size of centrifuges is heavily influenced by the solids loading rate and operational duration.

At Burns & McDonnell, we are constantly evaluating performance. Through a workshop with South Adams County Water and Sanitation District staff, we developed an approach to aeration control that is saving the District over \$10K / month in electrical costs and reducing their carbon footprint.

We will work with staff to understand the desired operating conditions that will optimize operator requirements on a weekly or monthly basis. The system component selection will also incorporate such items as jar testing of polymer that will all be wrapped into an overall impact to operations.

Sequential Efficiencies: The third element is the deduction of a series of individual direct impacts, that when viewed together, in series will have a combined net positive impact. The beginning of the sequential efficiency in the design and selection of a centrifuge is to identify one that has a greater solids processing capability per connected horsepower. The following steps are sequences that build upon the initial step:

Sequential Benefits of Efficiency Improvements



A Reduction in connected horsepower per unit processed which:
Reduces the overall consumed power.

Shorter dewatering period due to higher throughput and,
Equipment selected has reduced maintenance requirements, which:
Reduces the amount of operator attention.

Equipment selected provides for higher solids concentration, which:
Reduces the overall number of trips to the landfill,
Reduces fuel consumption and reduced maintenance on the truck.

The selection of each process and equipment will have this type of scrutiny applied allowing our team to review and validate our selection thus identifying the “Net Positive Impacts.”

Your project manager, Greg Woodward, used this approach when he managed the previous Anaerobic Digester Rehabilitation Project. The rehabilitation project focused on the overall improvements to the digester cover, mixing and gas handling systems. Instead of the replacement in-kind, Greg suggested the evaluation of a new technology linear motion mixer (LMM). This type of mixing has proven very effective in other similar applications and has approximately 1/5 of the connected horsepower than the existing mixing systems. Additionally, the mixer components are all located on the digester cover for easy and simple access by operations. Maintenance requirements were limited to the greasing of the mixing yoke. The simplicity of the system provided for reduced; power consumed, operator attention, and scheduled maintenance.

Project Understanding

The City treats its wastewater at the WWTP through a series of processes that include influent flow equalization, pre-treatment of screening and grit removal, primary clarification, secondary aeration processes of both plug flow extended aeration and a modified MLE process for ammonia and nitrogen treatment, secondary clarification, and Ultra-Violet disinfection. Primary solids are anaerobically digested, whereas secondary solids are aerobically digested with a blend of both solids streams occurring prior to belt filter press dewatering, with final disposal at the local county landfill.

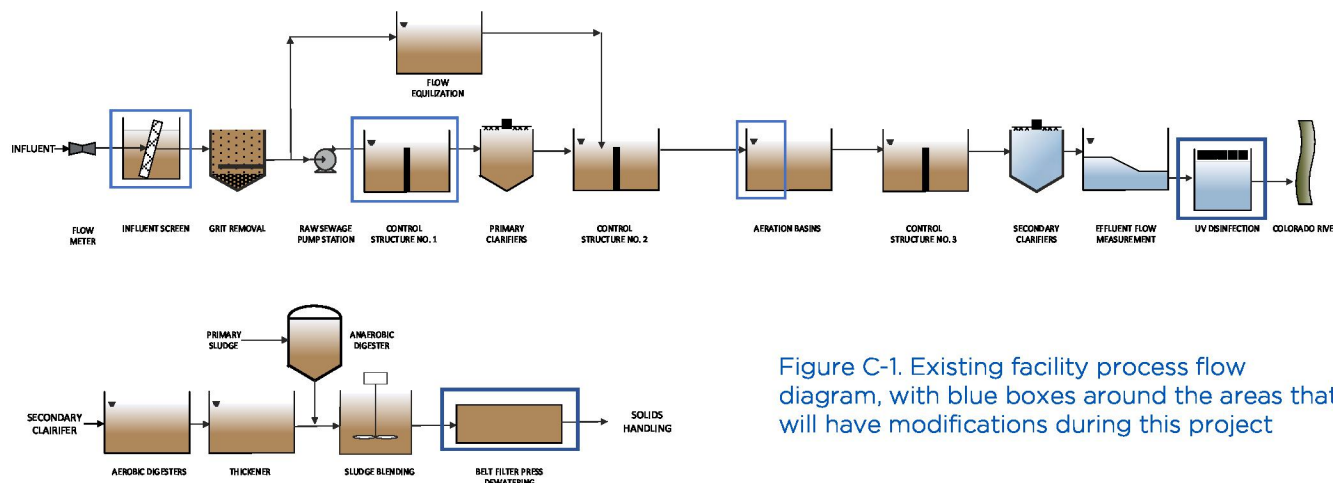


Figure C-1. Existing facility process flow diagram, with blue boxes around the areas that will have modifications during this project

The City is proactively expanding and improving its existing Persigo wastewater treatment plant so that it will have capacity to treat the City's wastewater flows for many years to come. While the City does not have to start expansions until 2028, per their 2020 Water Master Plan, the City is starting now because their growth has exceeded their predictions.

The City is seeking an engineering partner that will work with the City and a contractor (to be selected as part of this project) to perform process upgrades to the facility.

Burns & McDonnell has completed many projects in this fashion, and we understand clearly how the teamwork process can meet these goals. The City has identified four areas as priorities for replacement, improvement, and expansion. Each section, below, discusses the various treatment areas in greater detail.

The purpose of the CMAR teaming arrangement is to:

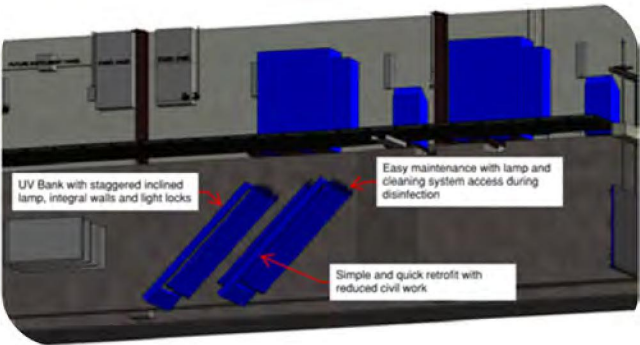
- ✓ Optimize design/ construction to meet the project schedule
- ✓ Remain within budget
- ✓ Get the most of the available project funds reducing their carbon footprint

Through the 2020 Master Plan, the City has outlined the major process upgrades to be tackled first. Our experience completing projects like this one has proven the importance of having an end goal while remaining flexible in how we achieve the goal. A major process upgrade such as this one will impact most of the treatment facility. We will work with the operations staff and future contractor to create a constructible project that will keep the existing facility in compliance during construction.

Burns & McDonnell has reviewed the scope of services in the RFP in detail and it appears sound for the stated project. We have focused this section of the proposal on some of the main project improvements in detail. We have highlighted some of the main design considerations and challenges associated with each of these improvements in the following sections.

UV Disinfection

The Master Plan describes improvements to the existing UV disinfection system by improving redundancy and hydraulics through the system. At the time when the UV system was installed, the Trojan 3000+ model was a logical selection that is more efficient than the larger medium pressure units. Since that time, Trojan has made improvements to their higher-capacity, low-pressure systems with the Signa model. The Signa system is more efficient than the existing 3000+ and uses only 48 bulbs compared to 216 (including redundancy) required with your existing UV system. The inclined lamps are also less hydraulically sensitive than the horizontal configuration of the 3000+. All of these improvements mean cost savings and simplified maintenance for the operations staff.



One option for the UV Improvements is to install a new Signa system next to the existing 3000+. The Signa is better suited to the flow rates at Persigo and is expandable should flow rates change in the future. While the 3000+ still has usable life, the improvements available with the Signa system should be considered as an option rather than purchasing shelf-spares for the 3000+. This option does add some cost to the UV project alternative, but it also aligns the treatment process with your future treatment goals.

Case Study | Signa at Plum Creek Water Reclamation Facility

PCWRA's WWTF has two UV channels. The previous Trojan 3000+ system was undersized to treat PCWRA's anticipated future flows. Also, the channels at PCWRA's WWTF are deep, making bulb maintenance a challenge. In this Construction Manager-at-Risk (CMAR) project, we presented equipment options to the Owner, who took our recommendation to install a Trojan Signa system. In addition to the UV equipment, we installed a new serpentine weir to reduce head loss through the system. The UV equipment was installed one channel at-a-time so that one channel would always be online to maintain permit compliance. The successful UV equipment upgrade saw no significant UV downtime and no permit violations during construction.

Issues:

- ✖ Limited flow capacity
- ✖ Excessive head loss
- ✖ Deep channels; challenging maintenance access

Solutions & Benefits to the Owner:

- ✔ Increased flow capacity
- ✔ Less head loss
- ✔ Easy maintenance via light removable ballasts

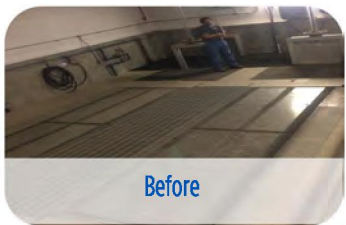
Relevance to the City:

The City of Grand Junction will need to keep their UV disinfection system running during the project to meet discharge permit requirements. This particular Burns & McDonnell team has recently performed multiple UV disinfection system upgrades while keeping the existing system operational and without permit violations.



Case Study | Trojan 3000+ at Boxelder Sanitation District (BSD) WWTF

BSD had Enaqua flow-through UV disinfection equipment installed in two shallow channels. The existing system had restrictively high headloss and the shallow channels limited what retrofit equipment could be installed. In this construction manager-at-risk (CMAR) project, we worked with BSD to decide to install a Trojan 3000+ system in the existing channels. Installing the new system required pouring new baffle walls, modifying the inlets and outlets of the channels, and installing a velocity-dissipating diffuser plate. We also replaced the existing serpentine weir with electrically-actuated weir gates to provide much-needed hydraulic flexibility. UV equipment was installed one channel at a time to maintain disinfection at all times during construction.



Issues:

- ✖ Limited flow capacity
- ✖ Shallow channels

Solutions & Benefits to the Owner:

- ✔ Increased flow capacity
- ✔ Less head loss
- ✔ Easy maintenance with shallow channels

Relevance to the City:

This same Burns & McDonnell team designed and completed UV upgrades as part of Boxelder Sanitation District's WWTF Expansion project. During construction, our team identified that actuated weir gates, rather than a new finger weir, would ease installation and save the Owner hundreds of thousands of dollars in construction costs. Our design does not end at IFB; we continue looking for improvements, cost savings and installation efficiencies throughout construction to optimize the outcome for the City.

Aeration System and Blower Building

The City's existing pumping and piping gallery between the two sides of aeration basins houses RAS pumps, WAS pumps and blowers. In addition to the RAS/WAS pumps posing a flooding risk to the blowers, the space is cramped, operators struggle to prevent the blowers from overheating, and there is limited access to maintain and remove the blowers. We propose a three-stage approach to addressing the City's aeration basin expansion.

The first step is to install permanent baffle walls inside both sides of the existing aeration basins. The City operates the current eastern aeration basin in the Modified Ludzack-Ettinger (MLE) style using a temporary curtain wall. Permanent baffle walls inside both existing aeration basins will increase nutrient removal ability. The blue baffle walls in the cutaway in Figure C-2 show how the aeration basins could be permanently modified.

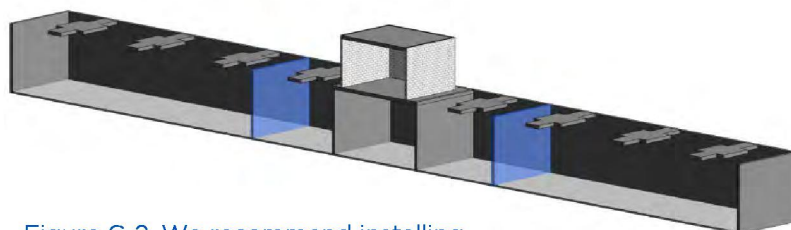


Figure C-2. We recommend installing permanent baffle walls in the existing aeration basins.



Figure C-3. Our recommendation is to put the new blower building on top of an extension of the RAS/WAS pumping gallery, which would be extended southward.

We recommend a similar comparison for the aeration system itself to determine if replacing the existing diffused air aeration system and/or installing more precise aeration control technology could save the City in operations energy and cost while making diffuser maintenance easier.

In the last – and future – phase, when further aeration basin expansion becomes necessary, the pumping gallery will already be in place to house additional RAS and WAS pumps. Figure C-4 shows how the future expansion might look.

A list of benefits associated with our proposed aeration system and blower building relocation approach is outlined in the following table.

Next, we recommend extending the RAS/WAS pump gallery to the south and locating the new Blower Building on top of the new pump gallery as shown on Figure C-3. A pair-wise comparison of blower alternatives is critical to select the blower type best suited to the City's needs in terms of capital cost, operational cost, ease of operations, and any further specific parameters the City would like to use for comparing technologies.



Figure C-4. Visual of future aeration basin expansion.

Our Recommendation:	Benefits to the City of Grand Junction:
Extend pump gallery to the south	<ul style="list-style-type: none"> ✓ Keeps process layout orientation intact and allows for future expansion ✓ Space is provided for RAS/WAS pumps when A-basin expansion occurs ✓ Provides additional ingress/egress in and out of pump gallery to improve worker safety and access.
Locate Blower Building above new pumping gallery	<ul style="list-style-type: none"> ✓ Existing aeration piping can be reused ✓ Even air flow split among aeration basins ✓ Blowers can be easily accessed through overhead door at ground level.
Early blower selection is recommended based on a fully integrated pair-wise comparison of technologies and individual blowers	<ul style="list-style-type: none"> ✓ Blower Building design specific to equipment, reduces construction costs (compared to contractor modifying a generic design) ✓ Reduce aeration energy costs during operation
Install permanent baffle wall in both existing east and west Aeration Basins to operate both sides in the MLE fashion	<ul style="list-style-type: none"> ✓ Increase nutrient removal capacity by increasing nitrification/denitrification potential ✓ Reduce overall aeration demand.
Run pair-wise comparison to potentially replace existing Sanitaire diffuser grids in aeration basins (e.g., with large bubble mixing coupled with fine bubble diffusers)	<ul style="list-style-type: none"> ✓ Alternative systems such as the EnviroMix system reduce blower sizing by using compressed air for mixing (smaller blowers means less energy consumption)
Install necessary sensors to integrate more precise aeration control into aeration basins	<ul style="list-style-type: none"> ✓ Maintain a more stable effluent quality and reduce required aeration

Case Study | Large Bubble Mixing at Boxelder Sanitation District WWTF

A pair-wise technology comparison of aeration systems for Boxelder Sanitation District indicated the EnviroMix large-bubble-mixing with fine-bubble diffused air system could save BSD up to \$180,000 each year on aeration costs (compared to a conventional Sanitaire system). As the Construction Manager-at-Risk, Burns & McDonnell worked with the Contractor early on to perform pair-wise comparisons of both aeration system alternatives and types of blowers. In this case, positive displacement blowers proved to be the best choice in terms of capital cost, energy consumption and ability to meet operational requirements.

Issues:

- ✗ High energy costs of conventional aeration
- ✗ Higher maintenance costs for larger blowers

Solutions & Benefits to the Owner:

- ✓ Reduced energy and maintenance costs by shrinking blowers through compressed-air large bubble mixing

Relevance to the City:

Evaluations for all major pieces of equipment should be performed together with the Contractor early in the project. Selecting equipment early enables our team to design structures specific to particular pieces of equipment which results in space savings and fewer changes during construction compared to contractors modifying a generic design to fit a particular piece of equipment. A pair-wise comparison of aeration systems for the City of Grand Junction’s aeration system may reveal that an alternative aeration system, such as the large bubble mixing coupled with fine bubble diffused aeration system offered by EnviroMix, could save the City operations costs simply aerator maintenance for plant operators.



Before



Construction



After

Dewatering

The final disposal of the City’s Biosolids has been hauled to the landfill where the material has been used in a commercial composting process, daily caps and just as a general waste product. To meet disposal requirements for the landfill, a paint filter test and radioactivity test is completed. At times the material being hauled to the landfill doesn’t pass the radioactivity test and requires a blending of fresh solids and then must be rehailed to the landfill. The paint filter test is a monthly test, the result of which is that City staff understand the operational capabilities of belt filter presses and know what is required to meet this test.

Capability to produce a higher solids concentration was a factor in the selection of centrifuges through the master planning process and was selected during the 2008 Planning. Producing higher solids concentrations greatly expands the City’s end use options, including land application for site restoration, agricultural uses, or various City sites where a Class B solids could be used. Additionally, composting could become a viable end use market, if desired. All these options start with a higher solids concentration.

The layout of the dewatering structure will need to account for many aspects:

Dewatering Structure Layout Considerations

- Sizing the centrifuges for current needs and expansion as the facility grows
- Incorporation of solids blending approach
- Type of loadout
- Type of vehicles used for the transport of solids from the WWTP
- Storage requirements at the WWTP
- Type of solids conveyance and load leveling systems
- Chemical storage volumes
- Ventilation requirements and odor control

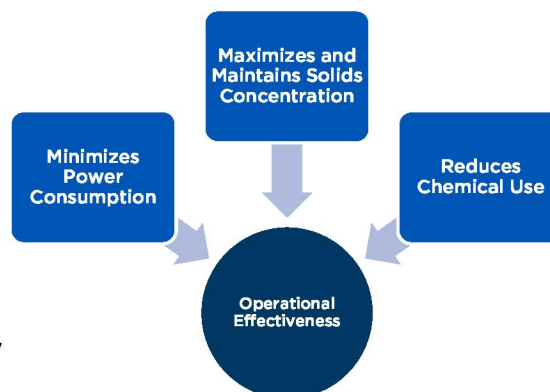
Centrifuge Sizing

The sizing of a centrifuge system has many impactful elements. One of the issues that will need to be addressed is the incorporation of Chemically Enhanced Primary Treatment (CEPT) or the incorporation of grease treatment, either near term or in the future. Solids loading has a significant impact to a single unit's process capabilities. The table below shows variations of processing options that account for a weekly schedule:

- ▶ The number of centrifuges
- ▶ Number of days weekly considering long weekends or absent key operational staff
- ▶ Operational period considering number and other responsibilities of key staff

	Current	2040	2060
Flow	10.8 mgd	13.5 mgd	16.8 mgd
Influent Concentration	265 mg/L	265 mg/L	265 mg/L
Influent BOD Loading	23960 ppd	29820 ppd	37100 ppd
Post Digestion Yield			
Annual Solids Production	1650 dT/yr	2060 dT/yr	2572 dT/yr
Yield/ Day	9,041 lbs/day	11,288 lbs/day	14,092 lbs/day
Yield/ Week	63,288 lbs / wk	79,014 lbs / wk	98,647 lbs / wk
Liquid Yield @ 2.5% Solids	43,363 gal / day	54,138 gal / day	67,590 gal / day
Liquid Yield / wk	303,538 gal / wk	378,963 gal / wk	473,129 gal / wk
Dewatering Operational (Days / Week)	3 day/wk	3 day/wk	4 day/wk
Number of Units Operating	2 units	2 units	2 units
Dewatering Period (Hours/ Day)	4.5 hrs	5.5 hrs	5.5 hrs
Conversion Hrs: Min	60 min	60 min	60 min
Hydraulic Dewatering Rate / Unit	187.4 gal/min	191.4 gal/min	179.2 gal/min
Solids Loading/ Period /Unit	2344 lbs/hr	2394 lbs/hr	2242 lbs/hr

Our focus is based on maintaining a consistent solid loading rate to each centrifuge, maximizing operational periods, in turn maximizing an *operator's effectiveness* for dewatering and other daily tasks. This approach allows for optimization of a centrifuge operation that has a hydraulic loading range of 75 - 200 gpm and a solids loading range of 650 - 3000 pph. From the operational preferences expressed by City staff, we can provide a system layout that meets those requirements, and that is also flexible to meet varying conditions that will ultimately present themselves.



This approach allows for optimization of a centrifuge operation that has a hydraulic loading range of 75 - 200 gpm and a solids loading range of 650 - 3000 pph. From the operational preferences expressed by City staff, we can provide a system layout that meets those requirements, and that is also flexible to meet varying conditions that will ultimately present themselves.

Solids Blending

The tank associated with the blending of the two solids streams will need to be sized according to the intended operation of the centrifuge. Processing volumes will be directly related to the sizing as discussed above.

As noted in the master plan, the intent is to move away from aerobic digestion, at which time the tank functions less for blending and is simply a holding tank and possibly could be phased out. Therefore, the tank should not be sized for future volumes but rather current operations and be considered as a structure that would be expanded based upon operational practices developed with the initial phases of dewatering.

Dewatered Cake Loadout

The norm for hauling dewatered solids is currently a triple axel tandem end dump truck. This will have the smallest footprint for a load out bay but may not be ideal for future conditions. The concept design shown in a similar designed system has a footprint sufficient for a full-size tractor trailer setup. Final disposal options may also prove to be better served by variations in truck sizes. Discussions during our conceptual design workshops will establish the needs and layout of the dewatering structure.

Conveyance & Load Leveling

Currently the belt presses use a non-pleated belt to convey solids to the loadout bay. Discharge is to a single point in the bay and requires movement of the vehicle in the bay to maximize loading. However, with a low solids concentration from the current system, most of the weight is water weight so optimizing loadout is limited.

With the introduction of centrifuges and an increase in solids concentration, the limitations typically become more a function of the wheel load limitations on secondary roadways and load leveling becomes much more beneficial. Optimizing a load for weight as well as distribution will improve *efficiencies*. Balance and optimization of a load for total weight over time will save a significant amount of fuel and maintenance costs.

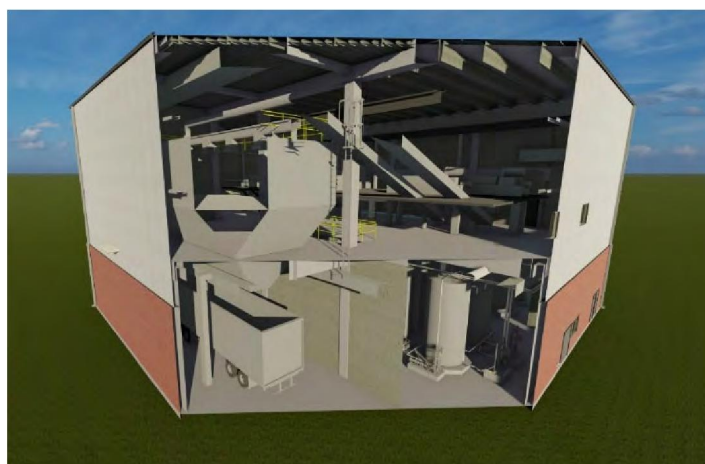


Figure C-5. Cut away of a two-story dewatering facility with conveyors, cake storage, chemical storage and load out bay.



Figure C-6. Load leveling Dumpster Veyor at the Stonegate WWTP

Storage Options & Odor Control

As identified in the Master Plan there are variety of situations that pose a risk to a smooth day to day operation of a solids handling and processing facility. These risks will impact the likelihood of being able to transport dewatered solids from the treatment facility to the end market, whether landfill or future land application sites. To address this operational challenge, the plan currently has a 100-day storage area. While a good practice, we would suggest looking at this need progressively. A system that has the capacity for storage of this duration will quite often go unused for the majority of the time and will be a sunk investment if not fully utilized.

An option would be to grow into a structure that is of the size needed for most situations. Land application programs will take a while to mature. Near term disposal will likely still utilize the landfill and plant staff understand the challenges faced with hauling there, as opposed to land application practices with growing crops or rangeland applications where challenges have yet to be experienced.

Crop application is limited to when spreading equipment can get onto a site being limited to single application with most row crops, and 2 or 3 application periods for crops such as alfalfa which can be applied to in between cuttings. However, the CDPHE has allowed for site specific storage of material to address the challenges associated with limited options for application. Incorporating a reduced or alternative storage strategy could be considered based upon site specific needs.

As an alternative strategy, we have designed hoppers for a system to meet short term storage options. This approach can provide storage for 2 to 3 days, or allow for direct loading, allowing you the ability to meet point of end market challenges. Figure C-7 is rendering of a design we completed for a client that had a week's worth of storage in a hopper located on the second floor. The hopper was loaded with screw conveyors with an option to discharge direct to a load leveling system above the truck. This layout allows for significant flexibility and efficiencies for this facility.



Figure C-7. Dewatering facility with one week storage hopper

No matter where solids are stored, there will always be the potential for odors. Rewetting or partial stabilization can occur. Covering the storage areas provides for some preventative measures for odor control. However, capturing and treating odorous air in the dewatering structure should be strongly considered. While centrifuges are enclosed, their discharge, conveyance and storage before hauling are generally open to the building and odor control should be considered. Our approach for this design will be to assist the City in identifying design options and working through the selection process selecting the most flexible cost applicable system.

Case Study | Centrifuge Sizing and Ancillary Support Equipment, City of Gillette

A major element of City's approach to the solids handling improvements centered around the identification and selection of the ancillary supports elements for the dewatering system. The City was in the process of upgrading the overall system. Storage, conveyance, centrate management, style of building and loadout system as well as the actual processing capacity of the dewatering system were evaluated. Based upon the outcome from Burns & McDonnell's workshops with leadership and operations staff the formation of the project was developed.



Challenges:

- ✖ Storage Volumes of both liquid and dewatered solids that provides flexibility in dewatering operations.
- ✖ Centrifuge sizing
- ✖ Chemical system sizing and accessibility
- ✖ Dewatered cake conveyance
- ✖ Loadout Style
- ✖ Effective load leveling

Solutions & Benefits to Owner

- ✔ Providing a system sized to meet the Cities needs
- ✔ Optimal Operating periods
- ✔ Provide a design that accounts for a variety of end use markets or process changes
- ✔ Providing options for material handling.

Relevance to the City:

The concept design workshop initially reviewed the sizing of the centrifuge based upon operational restrictions, labor availability, impacts from work schedules (e.g., # of days per week available for dewatering), holidays and extended weekends allowed for the sizing of the centrifuge. Conveyance of cake solids drove the decision of a two-story building with direct discharge to a ground level, drive through loadout bay. No storage was incorporated as the City had access to multiple end use sites and additional trucks for onsite storage of dewatered solids.

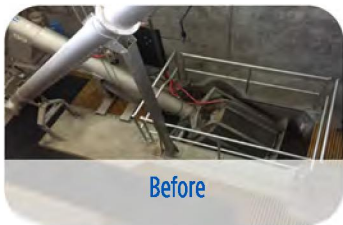
Headworks: Screening and Grit

The Master Plan describes multiple alternatives for replacing and improving screening and grit washing equipment. We understand that new equipment should be sized to facilitate a future re-rating of the WWTP to 13.5 MGD. We also understand from previous experience and as noted through plant tours that the existing electrical and HVAC equipment will likely need to be replaced with equipment meeting NFPA 820 and NEC requirements for a classified area. Based upon room and building orientation we will evaluate the separation of MCC and controls rooms to provide an added layer of safety from high-voltage equipment. Further, we would look to provide multiple ingress/egress points to and from the Headworks Building to further meet codes and improve worker safety.

As with the other parts of the project, our approach will be to evaluate the screening, grit processing, and grit/screenings conveyance alternatives presented in the Master Plan during the conceptual phase of the project and make a decision in partnership with the City regarding which equipment is best suited for the applications, and that incorporates institutional knowledge and preferences. Crucial to the success of our design will be our work together with the CMGC contractor to develop a detailed manual of permitted operations (MOPO) for transition of key equipment (e.g., screens, screenings and grit compactors, major electrical panels) to provide a no-downtime construction process.

Case Study | Screen and Grit Washer/Compactor Improvements at Boxelder Sanitation District

In 2020-2021, this Burns & McDonnell team performed headworks upgrades at BSD's WWTF. A main component of the upgrades was doubling the capacity of the mechanical screens. Our CMAR team worked with the contractor to install a new rotary drum screen in an existing second screening channel and a new manual bar screen in a third channel. The third screening channel was previously a grit removal channel that was modified during construction. All of this took place without plant downtime and while keeping screening online.



In addition to doubling mechanical screening at Boxelder Sanitation District's WWTF, we upgraded to a new Coanda grit washer/compactor. We were able to reuse the existing grit pump by replacing the pump's belt and sheave, saving the Owner capital costs. 3D modeling of the grit piping enabled our design team to anticipate potential conflicts with other piping and HVAC in the Headworks basement. This is just one example of how our 3D models save money during construction by preventing conflicts and reducing change orders.



Issues:	Solutions & Benefits to Owner
<ul style="list-style-type: none">✗ Mechanical screening undersized for anticipated flows✗ No mechanical screen redundancy✗ Grit washer/ compactor produced wet grit✗ Significant inefficiencies	<ul style="list-style-type: none">✓ Additional mechanical screen adds redundancy and adds capacity for anticipated future flows✓ New Huber Coanda grit washer/compactor produces a quarter of the volume of grit the plant previously saw because it removes much more water from the cleaned grit

Relevance to the City: Maintaining plant operations throughout construction will be critical to this project's success. Our team has completed multiple headworks upgrades recently which required uninterrupted operations. We develop a MOPO with the contractor to avoids potential issues we provide the on-site support to troubleshoot on the ground and in real time.

Similarly, startup of a new piece of equipment requires proper preparation. At Boxelder, this Burns & McDonnell team recently worked with the contractor and equipment manufacturer to assist the Owner during commissioning of their Coanda Grit Washer/Compactor. Startup was smooth, operations went uninterrupted, and the Owner is very satisfied with how efficiently the Coanda unit operates.

Per the Master Plan, modifications to Control Structure No. 1 are necessary to reduce hydraulic restrictions. Burns & McDonnell will investigate options during conceptual design and decide the best route forward together with the City.

Hydraulic constraints are not always obvious and can be caused by numerous issues. To fully understand hydraulic constraints, we need to ask the correct questions. After the correct questions have been asked and it is determined what/where the constraint is, it is time to resolve the constraint(s) most efficiently. Burns & McDonnell has extensive experience investigating hydraulic constraints, determining answers to the questions, and finding efficient solutions to the answers. Below are examples of efficient solutions to the hydraulics questions.

Questions:

- ✖ Is it the splitter structure itself?
- ✖ Is it the interior components of the splitter structure?
- ✖ Is it the inlet/outlet pipe configuration?
- ✖ What other upstream/downstream constraints could be having an impact?
- ✖ What time of day/flowrate does it happen? Does it consistently happen at this time?
- ✖ Was a static hydraulic model enough or do we need a dynamic model to nail down the fully define the constraint?

Solutions:

- ✓ Extend the walls of the structure
- ✓ Influent/Effluent piping modifications
- ✓ Entire new structure
- ✓ Hydraulic baffle walls
- ✓ Telescoping valves
- ✓ Electric actuated weir gates with ultrasonics for automated flow splitting
- ✓ Manually adjustable weirs for manual flow splitting

Case Study | City of Pierre WWTP Splitter Structure

One side of the City of Pierre's activated sludge basins always received more flow than the other side and there was no way to control the split of flow between the basins. Burns & McDonnell completed a hydraulic analysis of the influent splitter structure and dug down to the root causes of the uneven flow split.



Existing Splitter Structure

After the root causes were identified from the hydraulic analysis Burns & McDonnell worked together with the operations staff to come up with a handful of solutions to eliminate the constraints. After numerous design meetings and workshops, these solutions were narrowed down to an efficient solution to the problem. This solution was robust, cost effective, and operator friend and is outlined below.

Issues:

- ✖ Uneven flow split
- ✖ Inability to control flow split
- ✖ Downstream flow constraints
- ✖ Influent piping connection

Solutions' Benefits to Owner

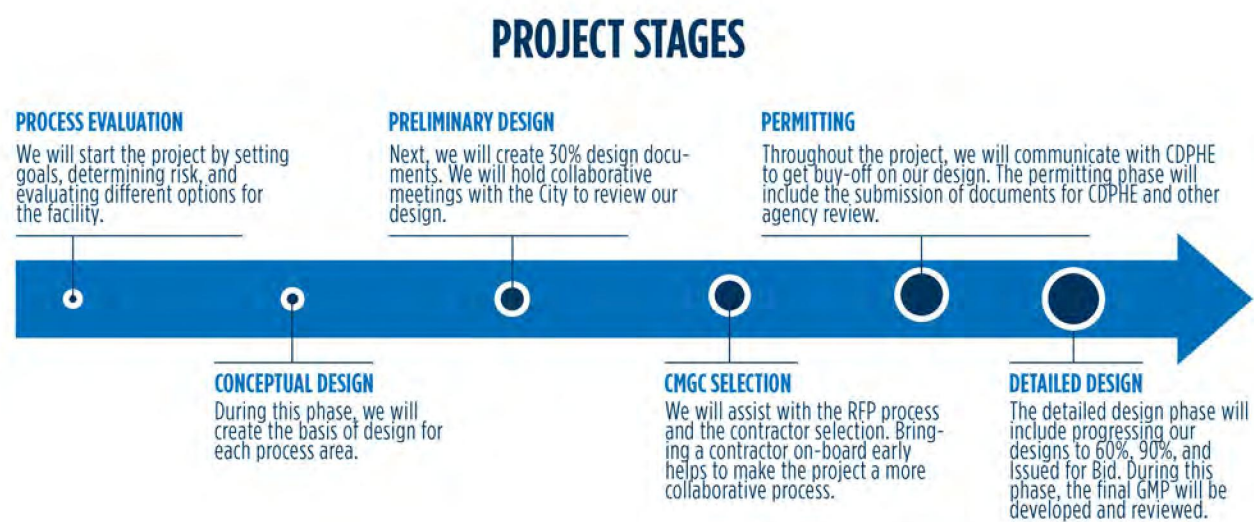
- ✓ Raise the existing concrete weir walls to eliminate downstream influence
- ✓ Modify the influent pipe location
- ✓ Install manual isolation gates

Applicability to the City:

A similar hydraulic analysis will be completed of Influent Splitter Box #1 to further define the hydraulic constraints and come up with efficient solutions to eliminate the constraints. Once the the constraint(s) and solutions are outlined, Burns & McDonnell will work closely with the City to determine which of the solutions efficiently addresses the constraint(s) and City concerns. This will form the basis of the upgrades to Influent Splitter Box #1 and allow this phase of the project to move into preliminary design.

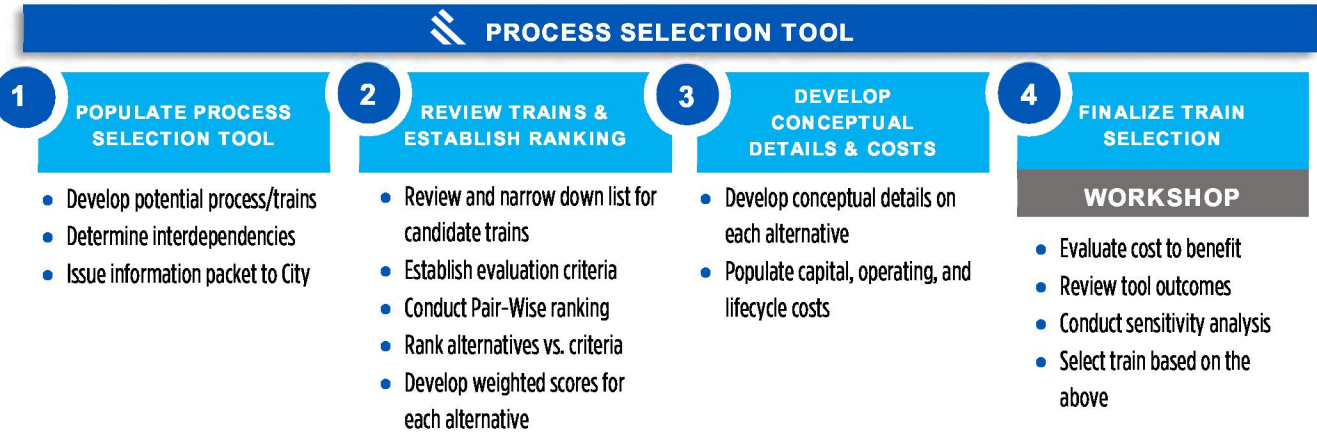
Project Approach

Our approach to this project is summarized into six key areas, as shown in the timeline, and described further, below.



Process Evaluation

We will start the project with a kickoff meeting to determine the City’s project goals and identify risks. Once the project parameters are agreed upon, we will review existing information, identify process options, develop design criteria, receive information from the operators and write a technical memorandum, summarizing our findings. Evaluations of the process options will include O&M costs, capital costs, system operability, maintenance requirements, etc. to help the City make an informed decision. We will use our process evaluation tool to help the City evaluate the monetary and non-monetary elements of each option. Below is a graphic illustrating our process selection tool process.



We will schedule and conduct a workshop that will be used to develop the system evaluation criteria for each process area. Using this tool, our team will engage the City in a collaborative workflow, the results of which will be a defensible, unbiased, team decision for the preferred alternative.

Deliverables and meetings during this phase include:

Task Deliverables	
✓ Project Kickoff Meeting	✓ Process Evaluation Summary Technical Memo
✓ Operator Questionnaires & Workshop	✓ Process Evaluation Summary Workshop

Conceptual Design

Once the final process options are determined and selected in the process evaluation phase, we will begin conceptual design. This phase will consist of a Conceptual Design Summary Technical Memorandum to summarize the basis of design for each of the four areas. A Review Meeting will be held after the memorandum is submitted to review the basis of design with the City and address any questions. Deliverables and meetings during this phase include:

Task Deliverables	
✓ Conceptual Design Summary Technical Memorandum	
✓ Conceptual Design Summary Technical Memorandum Review Meeting	

Preliminary Design

Once the basis of design is reviewed and agreed-upon during the Conceptual Design Phase, we will start the design documents. At the completion of this project phase, we will submit 30% drawings, a table of contents of anticipated specifications, and a 30% Engineer’s Opinion of Probable Cost (EOPCC). The design documents are assumed to be submitted separately, with one submittal per process area. Once the City has time to review the 30% deliverables, BMcD will hold a design review meeting to allow a collaborative review of our proposed design.

Our team is committed to providing you with constructible design documents and opinions of probable cost throughout design that you can rely on. Because of our vast history of wastewater treatment plant design and in-house construction experience, we have a library of recent constructed projects and bid prices which will inform the opinions for this project.

The CMGC project delivery method provides a collaborative approach to the design and cost development of the project. A major contribution of the contractor is development of the Guaranteed Maximum Price (GMP) that establishes the building block for the final cost and scope of the project. You will have the opportunity to review the estimate, which is typically many pages and hundreds, if not thousands, of separate items.

VALUE ADDED

Our team does not rely on cost models available on the Market to estimate costs for wastewater facilities.

We use ground up estimates informed by local market data. Recent, local costs from other water & wastewater projects will be used to check the contractor’s estimate.

While the cost information is available, there may be so much information shown that it is difficult to decipher what cost is what. Our in-house construction estimators will create a parallel cost opinion to back-check the costs provided by the contractor. We will do this to reduce the variability of the estimate (i.e., missed scope items) and to provide the City with a second opinion concerning the viability of the cost estimate.

We will complete parallel cost opinion updates at the 30% and 60% design phases for comparison with the selected contractor’s estimates. These estimates can be used to validate the initial GMP and make sure the full scope is captured in the cost opinions. At the 90% GMP, the CMGC contractor will have hard-bid costs for the scope or work. Burns & McDonnell will provide a final review of the GMP cost opinion to provide further concurrence with the final value.

During preliminary design phase, we will submit the following deliverables and hold the following workshops:

Task Deliverables	
✓ Specification Table of Contents	✓ 30% Design EOPCC
✓ 30% Design Drawings; 4 packages	✓ 30% Design Review Meeting

CMGC Selection & Interface

The preliminary design phase sets the direction for the project and establishes the basis for the detailed design, construction, and project costs. By the time the 30% project milestone has been reached, the majority of the big project influencing decisions have already been made. To improve the collaborative nature of the project, we prefer to bring the contractor on board as soon as the 30% Design is complete. This allows the contractor to have a better vision of the full project, while still coming on board early enough to provide constructability comments.

During the CMGC Selection, we will help the City prepare a request for proposal (RFP) for a Construction Manager/General Contractor (CMGC). We anticipate this process to include reviewing qualifications packages and attending short-list interviews with the contractor firms.

As the project progresses the relationship between the City, CMGC and Burns & McDonnell is intended to work together developing best practices and creating an environment of collaboration. To enhance this collaborative environment, we intend to participate in two team building / partnering workshops. We can suggest individuals capable of conducting these meetings should the City be interested.

During this phase, we will submit the following deliverables:

Task Deliverables	
✓ Request for Proposal Review	✓ Proposal Review and Recommendation
✓ Question Responses and Addendum content	✓ Partnering Workshops (2)



Detailed Design

This stage of the project will include most of the design development. We will start by issuing a 60% Design Package. One benefit of using a CM/GC delivery method is that we can procure equipment early and design around the final equipment selection. At the completion of 60% design, we will bid out the major process equipment. We will provide recommendations on the equipment selection and incorporate the selection into our designs. At this phase, we will also create the draft Maintenance of Operations Plan (MOP). The MOP will be drafted at 60% design to enable the City to comment and request changes before the final documents are issued. Once 60% design is reviewed, we will proceed with 90% design.

At each milestone, the CM/GC contractor will submit a GMP. As discussed above, we will complete a parallel EOPCC for 60% design. Once permitting agencies have provided comments, we will issue the designs for bid. At that stage, we will provide bidding support, including answering questions and issuing addendums, if needed. Once bid is complete, we will issue the drawings for construction and review the contractor's final GMP.

During this phase, we will submit the following deliverables and hold the following workshops:

Task Deliverables	
✓ 60% Design Drawings and Specifications	✓ 90% GMP Review
✓ 60% Parallel EOPCC	✓ 90% Design Review Workshop
✓ 60% Design Review Workshop	✓ Issued for Bid Design Contract Docs
✓ Major Process Equipment Recommendations	✓ Issued for Construction Contract Docs
✓ Maintenance of Operations Plan	✓ Final GMP Review
✓ 90% Design Drawings and Specifications	

Permitting

While coordination with CDPHE will occur during every phase of the project, this phase includes issuing the drawings for permit review. We will start by issuing a CDPHE site application and process design report. We will also issue our drawings for City, County, and Fire review. We will incorporate any of the permitting agency comments into our Issued for Bid documents.

Packaging

The RFP describes the four work areas as separate projects. While the work will happen at different locations at Persigo, we suggest permitting all the work under a single Site Application with the CDPHE. To increase the permitted capacity, we will need to prove that each unit process can meet the increased demands. The primary component of the Site Application is the expansion of plant capacity, and each separate project supports the increased flow and loading capability of the plant.

It is also possible to combine the projects into a single document set. This will simplify the deliverables such as specification books and plan sets, allowing the contractor to bid a single set of documents. Project sequencing and timing can be managed through the specifications rather than by separating the work packages. The project expenditures can also be tracked by work area if needed.

The main reason for “packaging” the projects is to improve schedule, reduce cost, and simplify the project management. Schedule will be improved during design and bidding since there will be fewer separate deliverables and less duplicate work. Design and management cost will also be reduced for the same reasons.

Project Management

Greg Woodward's approach to project management centers around open communication and collaboration as it has been on previous projects. His number one priority as your project manager is to provide a high-quality work product that is in line with your expectations and project goals. He facilitates this by involving your staff early and continuously throughout the project with a series of progress calls/meetings, review workshops, and by making himself available any time additional coordination is required. This allows the Burns & McDonnell team and City's staff to build consensus on project goals, challenges, and design direction.



Collaborative communication not only facilitates teamwork and understanding, but it also keeps the project on schedule and within budget. Our goal is to have Board staff involved at every key decision point along the way. Since your staff and our team will be aligned, re-work and backtracking will be eliminated or minimized.

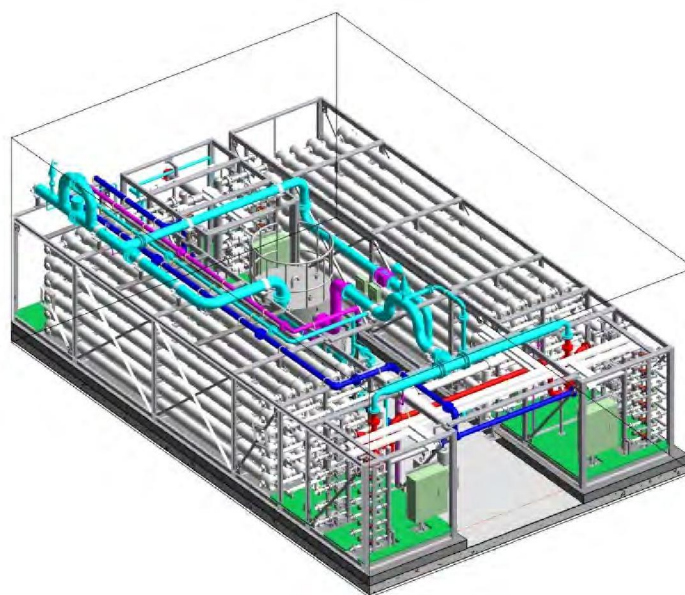
In Person Collaboration

Our team will hold meetings with the City at project milestones to gather information, consult with project stakeholders and build consensus on project objectives. The meetings will be interactive in nature and are planned at regular intervals. The initial meetings are of most significance to set the course for the project. Attendees will include City operations, engineering, and planning staff, other stakeholders, and Burns & McDonnell technical leads.

We will prepare agendas and facilitate the Kickoff Meeting and subsequent progress meetings. At each design milestone, the team will present documents prepared to date (technical memorandums, drawings, specifications and supporting documents). We will solicit feedback and input from the Board, and comments will be incorporated into the next sequential design deliverable. Our minutes prepared after the meeting will include a table of decisions made and actions required. The decision table will be a living document maintained throughout the project to track changes, justify the decisions, and avoid revisiting issues unnecessarily. Greg will have bi-weekly conference calls with the City's project manager to provide updates on work performed, effort planned for the following period, and issues that may affect scheduled delivery dates and costs.

3D Modeling

Our design team uses Autodesk Revit to generate plan sets. It is a great tool for all new vertical construction projects. Our team can create everything from basic walk-through models to 4D models that incorporate time phasing for construction.



3D model of the filter facility, part of a retrofit TDS reduction project at the Cherokee Water Reclamation Facility in Colorado Springs.

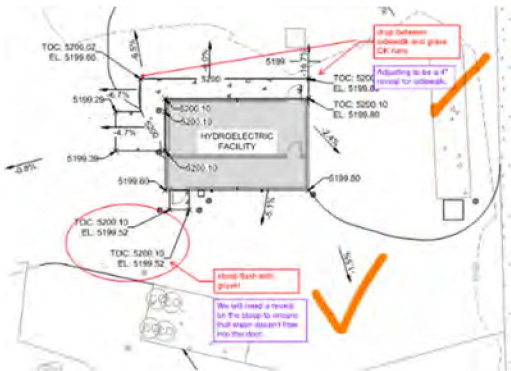
Some of the benefits of using a 3D model include discipline coordination, conveying the design to the owner, and making conflicts easy to spot. For those who do not regularly look at plan sets, we can create a preliminary model that shows walls, chemical tanks, equipment, and the spacing in the area.

We can also easily create models for a “walk through” to show what the final product will look like, including virtual reality models. It is easy to modify the preliminary model based on the owner’s desired changes. This allows us to home in on the final product prior to completing the costlier final engineering calculations.

Collaborative Reviews

Our team will establish and maintain a web-based document review system through “Bluebeam by Revu” for the City’s review of all project deliverables (technical memos, reports, drawings, specifications, and opinions of probable construction costs.

This tool will allow the City and Burns & McDonnell to collaborate and mark-up cloud-based documents in real time. The City will be able to enter comments, see our response, and track the close-out of each comment. A comment/ response register will be generated at each design milestone. This powerful tool offers a quick visual record of all comments and actions, while providing a traceable method to backcheck to develop high quality, well-coordinated documents.



Example Bluebeam Revu Session Comment, Response and Backcheck.

Design Quality Control

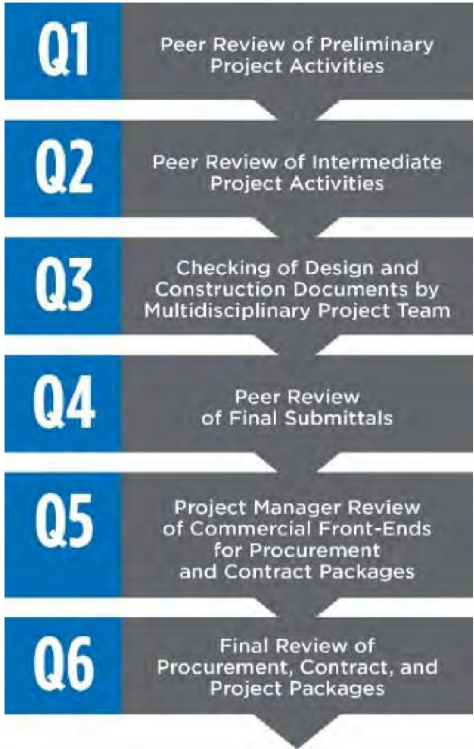
Burns & McDonnell has an established, formalized quality control program that is mandatory on all projects. It is utilized to develop project documents in conformance with the project requirements. The program uses Standard Quality Control procedures to check and review documents in their final form, as well as the supporting data for those documents. Its purpose is to minimize inconsistencies, gaps, and interferences in the documents.

The specific activities to be followed on this project will be set by the project manager, defined in the Project Procedures Manual, and followed by all members of the project team.

Project Performance System

Your project manager, Greg, will maintain the project financials to provide an accurate representation of the level of project completion. The project performance system will be used as a tool to capture project progress and to provide accurate accounting.

The system is designed to track past costs and help project managers forecast costs-to-complete for each project. Greg will review time and cost forecasting for the



We will implement our six-step quality control plan on your project to manage quality.

project on a continual basis. While this system is primarily geared to provide accurate financials, it is an excellent tool to help the project manager understand exactly how the project is doing from both a financial and schedule standpoint. This information will then be used to help guide any project adjustments that may be needed.

Budget and Schedule Management

We use a portfolio of proven tools and processes that enable our project manager and team to look at both near- and long-term project drivers to determine how they can, should, and will fit into the project to meet both budget and schedule goals.

By placing such a high priority on this approach, we not only can anticipate and develop plans that validate the plan's feasibility but look at all alternatives to see where and how each project can get the most value without sacrificing quality, schedule, or budget.

During design, we will develop project "S" curves displaying project billed, billed to date, and earned value. The project team will review this graph monthly.

Communicate



Keep the entire project team, including City staff, aware of the project budget/schedule status. Enable the team to take ownership in the project as it evolves. Encourage each team member to be mindful of his/her purpose and commitment to the project from start to finish.

Continually Forecast



Identify project components that require the project to adjust in order to maintain the initial/approved schedules and budgets. This applies to both financial and human resources. Consistently review and manage project needs as the project evolves.

Manage Scope



Minimize project variations that can affect the overall budget and schedule. Keep all stakeholders aware of changes through regular updates. Address concerns or questions prior to decisions being made that could affect the project's outcome or stakeholders' standards and expectations.

Project Schedule

We have generated a project schedule based on the desired milestone dates in the RFP and the scope of work. There are usually two main factors controlling our ability to meet a schedule such as this one - outside permitting agencies, which we have limited control over; and determining core design parameters, such as flows, loads, and treatment processes. While this list of factors is very basic, these are the typical stumbling blocks we see on similar projects.

Outside permitting agencies ultimately control the ability to start construction. When completing a site application, there are specific steps that must be followed, one after another. The State's progress does not stop the designer from completing work on the project, but ultimately, construction can not start until we receive an approval letter from the State. In most cases, we complete work ahead of the State and provide them the information they require as soon as they are ready to see it. There can also be issues with obtaining the building permit. This process can take some time to complete to get through the building and fire department.

By focusing on these three key project management tasks, we help you receive the most value without sacrificing quality, schedule, or budget.

The best way to mitigate schedule issues from outside agencies is to be prepared and start early.

We have strong relationships with key regulators at the State, which helps us better provide the information that the State needs to keep a permit moving, as well as provide us the opportunity to find out what may be holding up a permit.

To mitigate internal schedule control factors, we propose to meet with the project stakeholders early to understand your thoughts, explore the alternatives, and come to a resolution. Reaching a resolution is critical to schedule, and we will work with the City to review the alternatives as thoroughly as needed to reach a resolution, then move on. We are here to help the City design and construct the facility you wish to operate. We are confident in our ability to complete the engineering portion of the project per the schedule.

Preliminary Project Schedule

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D. REFERENCES

D. References

Williams Monaco WWTP BNR Removal Upgrades | Henderson, Colorado



Client | South Adams County Water & San. District
JM Grebenc, Wastewater Systems Manager
(720) 206-0462
jmgrebenc@sacwsd.org
6595 East 70th Ave, Commerce City, CO 80022

Dates | 2014-2016

Project Value | \$20M

Relevance to City of Grand Junction

- WWTP retrofit project
- Operational facility during construction
- Blower replacement with automated control
- UV Disinfection retrofit
- Multiple splitter structures
- Grit washing & compactor

Our team provided design services to upgrade an existing WWTP to meet future nutrient regulations. The facility upgrade plan included a facility evaluation, alternatives analysis, process modeling, and cost budgeting for the upgrades. The planning for this upgrade also addressed operational issues within the existing facility, which were separate from the nutrient upgrades, but necessary due to age of equipment or other safety concerns.

The final design replaced the existing MBBR secondary process with an 8.0 MGD IFAS process in an A2O configuration. A new grit system was incorporated ahead of the existing primary clarifiers, and a new UV light disinfection system replaced the gas chlorination disinfection process. The project added a new secondary process train, three secondary clarifiers, and high-speed turbo blowers with D.O. control loop for aeration.

Stonegate Wastewater Treatment Plant Upgrades | Parker, Colorado



Client | Stonegate Village Metropolitan District
Gerald Whelan, Operator
(303) 912-1126
gerw@coloradowatersystems.com
16850 Parkerhouse Rd., Parker, CO 80134

Dates | 2012-2014

Project Value | \$12M

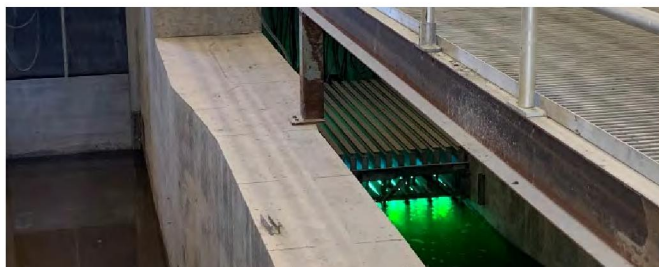
Relevance to City of Grand Junction

- WWTP retrofit project, completed as CMAR
- Operational facility during construction
- Influent screening & washer compactor
- Blower replacement with automated control
- UV Disinfection retrofit
- Multiple splitter structures

Originally constructed in phases during the 1980s and 1990s, the Stonegate Village Metropolitan District Wastewater Treatment Facility (WWTF) serves a large office park and residential area near Parker, CO. The WWTF operates within the Cherry Creek Basin with a permitted maximum month flow of 1.1 MGD, 0.05 ppm total phosphorus (TP) effluent limit, and 10 ppm total inorganic nitrogen (TIN) effluent limit.

We worked with the District to establish a planning level budget and improvement plan during the alternatives evaluation. We then completed the design and permitting with the assistance of a CMAR contractor to establish the guaranteed maximum price for the construction. The team also provided support during construction and startup of the facility. The final project incorporated a membrane bioreactor that was constructed in phases while the facility remained in operation.

Plum Creek Water Reclamation Facility Expansion | Castle Rock, CO



Client | Plum Creek Water Reclamation Authority
Wes Martin, Authority Manager
(303) 688-1991
Wesmartin@pcwra.org
4225 N. US Highway 85, Castle Rock, CO 80108

Completion Date | 2021

Dates | 2017-2021

Project Value | \$32M

Relevance to City of Grand Junction

- WWTP retrofit project
- Operational facility during construction
- Collaborative delivery (CMAR)
- Influent screening & washer compactor
- Grit washing & dewatering
- Blower replacement with automated control
- Influent splitter structure
- UV disinfection retrofit

The Plum Creek Water Reclamation Authority (PCWRA) has experienced strong development growth within their service area, driving the need for a plant expansion. They also see value in creating Class A biosolids which will reduce their dependence on contract hauling while creating an easily usable end product. Burns & McDonnell was hired to expand the plant treatment capacity from 6.4 MGD to 9.4 MGD while also upgrading the solids stabilization system.

The PCWRA selected the autothermal thermophilic aerobic digestion (ATAD) process to reach Class A biosolids. The process upgrades also included a new headworks, conversion of an un-used chlorine contact chamber into a continuous back-wash sand filter, disinfection upgrades, and other miscellaneous facility improvements.

TDS Reduction at Cherokee Water Reclamation Facility | Colorado Springs, CO



Client | Cherokee Metropolitan District
Amy Lathen, General Manager
(719) 597-5080 ext. 116
alathen@cherokeemetro.org
6250 Palmer Park Blvd., Colorado Springs, CO 80915

Dates | 2019- 2023 (est.). Design complete.

Project Value | \$45M

Relevance to City of Grand Junction

- WWTP retrofit project
- Operational facility during construction
- Collaborative delivery (design-build)
- Influent screening & washer compactor
- Grit washing & dewatering
- Blower replacement with automated control
- Influent splitter structure

Burns & McDonnell, as part of a design-build team, is providing design and construction phase services to reduce the Total Dissolved Solids (TDS) and bring the WRF into compliance with its discharge permit.

After examining piloting data, it was clear that TDS reduction could be achieved with a high-rate reverse osmosis (RO) treatment application added after the existing sequencing batch reactor (SBR) process.

Our team explored the option of tertiary filtration followed by microfiltration after the SBR. We also reviewed the alternative of changing the secondary process to a membrane bioreactor (MBR) so that no additional filtration would be needed. The option of converting SBRs to MBRs was selected based on the merits of reducing treatment steps, simplifying operations, and reducing costs.

Boxelder Wastewater Treatment Facility Expansion | Fort Collins, CO



Client | Boxelder Sanitation District
 Brian Zick, District Engineer
 (970) 498-0604
 brianz@boxeldersanitation.org
 3201 E Mulberry St. Unit Q, Fort Collins, CO 80524

Dates | 2018-2021

Project Value | \$34M

Relevance to City of Grand Junction

- WWTP retrofit project
- Operational facility during construction
- Collaborative delivery (CMAR)
- Influent screening & washer compactor
- Grit washing & dewatering
- Blower replacement with automated control
- Influent splitter structure
- UV disinfection retrofit

Our team provided design services to double the WWTP's phased isolation BNR secondary treatment process trains and to update its influent organic capacity to 4.6 MGD / 10,000 lbs.

The design included upgrades to the headworks/grit systems, a new UV disinfection system, and aerobic digestion with slow-speed dewatering. This expansion project is being completed using the CMAR alternative delivery method to create a strong owner-engineer-general contractor team and to meet an aggressive project schedule. Our team completed a 30% design package for general contractor selection, as well as facility planning, preliminary design, process and ancillary equipment design, final design, construction phase services, and outside agency/stakeholder coordination.

BNR Upgrades at Broomfield Water Reclamation Facility | Broomfield, CO



Client | City and County of Broomfield
 Ronda Jo Ackerman Alford
 (303) 464-5807
 ralford@broomfield.org
 One DesCombes Drive, Broomfield, CO 80020

Dates | 2014-2016

Project Value | \$3.9M

Relevance to City of Grand Junction

- WWTP retrofit project
- Operational facility during construction
- Blower replacement with automated control
- Influent splitter box modifications
- SCADA control
- Energy savings

As part of process upgrades to the Broomfield WWTP, Burns & McDonnell assisted the City with replacement of five multistage centrifugal blowers with mag-lev high speed turbo blowers. The project included modifications to the blower inlet headers and distribution piping/valves to improve aeration control at the facility. New MCC's, harmonic filters and power feeds were also incorporated.

A significant project challenge was mating the new blowers to the existing piping systems while keeping the facility in operation. This was done through careful 3-D CADD drafting and wastewater flow management through the facility's three process trains.

The blower control system utilizes a most-open valve approach to control the speed of the blowers and the distribution of air throughout the process trains. Dissolved oxygen monitoring probes provide feedback to the SCADA control loop.

Emporia Wastewater Treatment Plant Expansion | Emporia, KS



Client | City of Emporia

Dates | 2016-2019

Project Value | \$29M

Relevance to City of Grand Junction

- WWTP retrofit project
- Operational facility during construction
- Collaborative delivery (Design-Build)
- Influent screening & washer compactor
- Grit washing & dewatering
- Blower replacement with automated control
- Influent splitter structure
- UV disinfection retrofit
- Equalization basin improvements

As part of a design-build team, Burns & McDonnell provided planning, design, and construction services for the 3.8-MGD WWTP expansion. We designed and implemented improvements necessary for impending discharge permit requirements for effluent nitrogen (10.0 mg/L) and phosphorus (1.0 mg/L).

The overall treatment facility improvements included: Influent pumps and controls, headworks fine screen and replacement of the existing screen element, screening washer-compactor, Headcell grit removal system, conversion of aeration basins to IFAS BNR, large bubble mixing system for anaerobic, anoxic, and deox zones, high-speed turbo blowers, rehabilitation of final clarifiers/mechanism replacement, replacement of UV disinfection system, repair of effluent pump station valving, aerobic digester, WAS solids thickening processes, 2,000 square-foot laboratory, office, and administrative space.

Pierre Wastewater Treatment Plant Expansion | Pierre, SD



Client | City of Pierre

Dates | 2019-ongoing

Project Value | \$15M

Relevance to City of Grand Junction

- WWTP retrofit project
- Operational facility during construction
- Influent screening & washer compactor
- Grit washing & dewatering
- Blower replacement with automated control
- Multiple splitter structures
- Solids dewatering
- Hydraulic analysis

Burns & McDonnell permitted and designed a \$15 million project to upgrade the existing Pierre WWTP (6.4 MGD). The upgrades included replacement of nearly all process equipment, redesign of the process flow, and flood protection from the adjacent Missouri River.

The redesigned process flow simplified operation and eliminated the need for intermediate pumping within the facility. Additionally, the project included the permitting and design of a new effluent outfall on the Missouri River as well as a full-scale odor study within the City's collection system.

Using a collaborative approach, our team developed a comprehensive retrofit plan to utilize the existing infrastructure fully, participated in client design review meetings to confirm pivotal design decisions, and coordinated the detailed design drawing development. We reviewed technical submittals for design compliance during the construction phase and oversaw daily activities on behalf of the City.

What Some of Our Clients Are Saying:



The Burns & Mac team worked collaboratively with our team to engineer a design solution that met our process and treatment needs, while meeting our budget constraints. BMcD collaborated with our team to reduce the project cost by over \$6 million, which was driven by value engineering ideas.

- Amy Lathen, General Manager, Cherokee Metropolitan District
Cherokee WRF TDS Reduction Project



Burns & McDonnell designed the upgrades to the Wastewater Treatment Facility in Pierre, South Dakota, for which I was the facility operator. The facility had a great deal of aging infrastructure and inefficient treatment processes that were not meeting current effluent limits or projected wastewater treatment demands. Burns & McDonnell provided us with a design that simplified our operations AND that was robust and cost-effective. They maximized our existing infrastructure, simplified the overall treatment plant, and provided a complete facility retrofit design that could be constructed while the existing facility remained online, which was critical to us.

Burns & McDonnell's entire team is focused on what the operations staff needs to efficiently run a facility. They conducted in-depth site investigations and operator questionnaires to get feedback from all the team members, and hosted design workshops to make sure the entire team had buy-off on the plan before moving forward. I was very impressed with the project and would highly recommend Burns & McDonnell for any future projects.

- Hyrum Webb, Lead Operator, formerly with the City of Pierre
Pierre WWTP Expansion Project



Working with Burns & McDonnell (B&M) on the design phase of our 3 MGD WWTP expansion project has been a pleasure. From the very beginning B&M echoed Plum Creek's belief that staff input was key to the successful design of the project. B&M facilitated several workshops and meetings in which they walked through process design, equipment selection and overall plant ergonomics with the entire operations staff. Not only did they listen to staff input but they collaborated with staff on the details, drawings and even an interactive virtual 3D model, advising staff and if appropriate, incorporating suggestions into the final design.

Plum Creek was very pleased with the process and would highly recommend Burns & McDonnell for any future projects.

- Weston Martin, Authority Manager, Plum Creek Water Reclamation Authority, Plum Creek WRF Expansion Project

E. FEE PROPOSAL

E. Fee Proposal

Our completed Solicitation Response Form, detailed cost breakdown, and rate sheet immediately follow this page.

SECTION 7.0: SOLICITATION RESPONSE FORM**RFP-4972-22-DH Professional Engineering Services Consultant for Wastewater Treatment Expansion Projects**

Offeror must submit entire Form completed, dated and signed.

- 1) **All inclusive, not to exceed cost to provide professional consulting services to include, but not be limited to: engineering design, permitting, bidding, project management, and construction management services, and all other services required for the Wastewater Treatment Plant Expansion/Revitalization projects**

Task	Description	Costs
1	Engineering Design	\$2,064,842
2	Permitting	\$105,500
3	Bidding Assistance	\$68,360
4	Project Management	\$371,620
5	Design Support during Construction	\$475,590
	Construction Inspection	Hourly Rates
	Total Not to Exceed Cost	\$ 3,085,912

NOTE: A detailed breakdown of labor and other direct costs by task should be included.

The Owner reserves the right to accept any portion of the services to be performed at its discretion

The undersigned has thoroughly examined the entire Request for Proposals and therefore submits the proposal and schedule of fees and services attached hereto.

This offer is firm and irrevocable for sixty (60) days after the time and date set for receipt of proposals.

The undersigned Offeror agrees to provide services and products in accordance with the terms and conditions contained in this Request for Proposal and as described in the Offeror's proposal attached hereto; as accepted by the Owner.

Prices in the proposal have not knowingly been disclosed with another provider and will not be prior to award.

- Prices in this proposal have been arrived at independently, without consultation, communication or agreement for the purpose of restricting competition.
- No attempt has been made nor will be to induce any other person or firm to submit a proposal for the purpose of restricting competition.
- The individual signing this proposal certifies they are a legal agent of the offeror, authorized to represent the offeror and is legally responsible for the offer with regard to supporting documentation and prices provided.
- Direct purchases by the City of Grand Junction are tax exempt from Colorado Sales or Use Tax. Tax exempt No. 98-903544. The undersigned certifies that no Federal, State, County or Municipal tax will be added to the above quoted prices.
- City of Grand Junction payment terms shall be Net 30 days.

- Prompt payment discount of n/a percent of the net dollar will be offered to the Owner if the invoice is paid within n/a days after the receipt of the invoice. The Owner reserves the right to consider any such discounts when determining the bid award that are no less than Net 10 days.

RECEIPT OF ADDENDA: the undersigned Firm acknowledges receipt of Addenda to the Solicitation, Specifications, and other Contract Documents. State number of Addenda received: 1, 2, 3, 4

It is the responsibility of the Proposer to ensure all Addenda have been received and acknowledged.

Burns & McDonnell Engineering Company, Inc.

Company Name – (Typed or Printed)



Authorized Agent Signature

9785 Maroon Circle, Suite 400

Address of Offeror

Centennial, CO 80112

City, State, and Zip Code

Jason Schaefer, Principal

Authorized Agent – (Typed or Printed)

(303) 474-2265

Phone Number

jschaefer@burnsmcd.com

E-mail Address of Agent

January 14, 2022

Date

City of Grand Junction

RFP-4972-22-DH Professional Engineering Services Consultant for Wastewater Treatment Expansion Projects

Work Breakdown Structure and Fee Schedule



Activity	Project Manager	Design Manager	Technical Advisor	Process	Structural	Electrical	I&C	Mechanical	Civil	Architectural	Elec / I&C, Mech, Structural CADD	Estimator	Quality Control	BMcD Total Labor		Expenses	Direct Expense	Total Cost
	Greg Woodward	Andrew Waddoups	Brian Knadle	Andrew Toth Raegan Swartz	Kevan Thurman	Vamsi Patwari	Michael Johnson	David Olsen	Nick Tessitore	Ryan Lang Shawn Dalglish	Naweed Aryan	Kevin Waddell	Brett Pugh					
	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Cost	Direct	Cost	
TASK SERIES 100 - Project Management/General																		
Task 101 - Project Management	200	100	40	80	40	40	40	40	40	40	40			700	\$170,820	\$6,830		\$ 177,650
Task 102 - Project Kickoff Meeting	8	8	8	8	8	8	8	8	8					72	\$17,816	\$710	\$7,000	\$ 25,526
Task 103 - Bi-weekly Progress Meetings	52	52	12	52										168	\$41,208	\$1,650	\$18,000	\$ 60,858
Task 104 - Quality Control/Quality Assurance	16	16	4		40	40	40	24	24	40			120	364	\$90,800	\$3,630		\$ 94,430
Task 105 - Topographic Survey Assistance	8	8							8					24	\$6,360	\$250		\$ 6,610
Task 106 - Geotechnical Investigation Assistance	8	8			8									24	\$6,296	\$250		\$ 6,546
Sub-Total Series 100	292	192	64	140	96	88	88	72	80	80	40	0	120	1,352	\$333,300	\$13,320	\$25,000	\$371,620
TASK SERIES 200 - Process Evaluation																		
Task 200 - Review of Existing Data	4	8	4	20	8	8	8	8	8	8				84	\$19,756	\$790		\$ 20,546
Task 201 - Identify Process Options	40	80	40	120										280	\$66,280	\$2,650		\$ 68,930
Task 202 - Develop Design Criteria for Each Work Area	4	18	2	80	8	8	8	8	4	8				148	\$32,774	\$1,310		\$ 34,084
Task 203 - Operator Questionnaires & Workshop	12	12	4	40										68	\$15,404	\$620	\$3,000	\$ 19,024
Task 204 - Equipment Preferences Workshop & Equipment Site Visits	16	16	16	40										88	\$20,680	\$830	\$3,000	\$ 24,510
Task 205 - Process Evaluation Summary Technical Memorandum	4	8	4	40										56	\$12,200	\$490		\$ 12,690
Task 206 - Process Evaluation Summary Technical Memo Review Mtg	12	4	4	12										32	\$7,712	\$310	\$2,000	\$ 10,022
Sub-Total Series 200	92	146	74	352	16	16	16	16	12	16	0	0	0	756	\$174,806	\$7,000	\$8,000	\$189,806
TASK SERIES 300 - Conceptual Design																		
Task 300 - Conceptual Design	8	20	8	400	12	12	12	12	12	12				508	\$106,444	\$4,260		\$ 110,704
Task 301 - Conceptual Design Summary Technical Memo	4	8	4	20	8	8	8	8	8	8				84	\$19,756	\$790		\$ 20,546
Task 302 - Conceptual Design Summary Technical Memo Review Mtg	4	4	4	4										16	\$3,976	\$160	\$2,000	\$ 6,136
Sub-Total Series 300	16	32	16	424	20	20	20	20	20	20	0	0	0	608	\$130,176	\$5,210	\$2,000	\$137,386
TASK SERIES 400 - Preliminary Design																		
Task 400 - 30% Design Documents	40	80	20	400	120	120	120	100	100	120	400			1,620	\$345,880	\$13,840		\$ 359,720
Task 401 - 30% Engineer's Opinion of Probable Construction Cost	24	20	4	64	16	12	12	12	12	12		80		268	\$64,796	\$2,590		\$ 67,386
Task 402 - 30% Design Review Meeting	12	12	4	12	2	2	2	2	2	2		8		60	\$14,812	\$590	\$3,000	\$ 18,402
Sub-Total Series 400	76	112	28	476	138	134	134	114	114	134	400	88	0	1,948	\$425,488	\$17,020	\$3,000	\$445,508
TASK SERIES 500 - CM/GC Selection																		
Task 500 - CM/GC Contractor RFP Process	40	20		40										100	\$23,980	\$960		\$ 24,940
Task 501 - Contractor Interviews & Selection Assistance	16	12		20										48	\$11,448	\$460	\$2,000	\$ 13,908
Sub-Total Series 500	56	32	0	60	0	0	0	0	0	0	0	0	0	148	\$35,428	\$1,420	\$2,000	\$38,848
TASK SERIES 600 - Permitting																		
Task 600 - CDPHE Site Application	8	16		80					40					144	\$32,784	\$1,310		\$ 34,094
Task 601 - CDPHE Process Design Report	8	20	2	80										110	\$23,888	\$960		\$ 24,848
Task 602 - City, County, & Fire Authority Permitting	8	20	2	40	20	20	20	20	20	20				190	\$44,768	\$1,790		\$ 46,558
Sub-Total Series 600	24	56	4	200	20	20	20	20	60	20	0	0	0	444	\$101,440	\$4,060	\$0	\$105,500
TASK SERIES 700 - Detailed Design																		
Task 700 - 60% Design Documents	150	200	80	300	225	240	200	180	150	100	400			2,225	\$504,290	\$20,170		\$ 524,460
Task 701 - 60% GMP	8	8	8	8	2	2	2	2	2	2		40		84	\$21,316	\$850		\$ 22,166
Task 702 - 60% Design Review Meeting	12	12	4	12								4		44	\$10,880	\$440	\$3,000	\$ 14,320
Task 703 - Major Process Equipment Bidding/Selection	20	40	20	40										120	\$29,160	\$1,170		\$ 30,330
Task 704 - Maintenance of Operations Plan	20	40	20	80	2	2	2					4		170	\$39,602	\$1,580		\$ 41,182
Task 705 - 90% Design Documents	200	200	40	300	200	200	200	150	150	100	300			2,040	\$468,280	\$18,730		\$ 487,010
Task 706 - 90% GMP	20	8	8	8	2	2	2	2	2	2		40		96	\$24,532	\$980		\$ 25,512
Task 707 - 90% Design Review Meeting	12	12	4	12	2	2	2	2	2	2		4		56	\$13,764	\$550	\$3,000	\$ 17,314
Task 708 - Issue of Bid Design Documents	8	20	8	80	20	20	20	20	20	20	200			436	\$87,500	\$3,500		\$ 91,000
Task 709 - Bidding or Negotiating Phase	20	40	20	40	16	24	24	8	8	14				214	\$51,390	\$2,060		\$ 53,450
Task 710 - Final GMP Development Support	16	12	8	24										60	\$14,340	\$570		\$ 14,910
Sub-Total Series 700	486	592	220	904	469	492	452	364	334	240	900	92	0	5,545	\$1,265,054	\$50,600	\$6,000	\$1,321,654
TASK SERIES 800 - Design Services During Construction																		
Task 801 - Responding to CMGC Requests for Information	40	40		180	120	100	100	40	40	60				720	\$167,100	\$6,680	\$0	\$ 173,780
Task 802 - Addressing Changed Field Conditions	40	40		90	60	50	50	30	10	30				400	\$94,130	\$3,770	\$0	\$ 97,900
Task 803 - Attending Construction Progress Meetings	90	540												630	\$167,220	\$6,690	\$30,000	\$ 203,910
Sub-Total Series 800	170	620	0	270	180	150	150	70	50	90	0	0	0	1,750	\$428,450	\$17,140	\$30,000	\$475,590
Project Subtotals	1212	1782	406	2826	939	920	880	676	670	600	1340	180	120	12,551	\$2,894,142	\$115,770	\$76,000	\$3,085,912
Project Total																		\$3,085,912



Schedule of Hourly Professional Service Billing Rates

Position Classification	Classification Level	Hourly Billing Rate
General Office *	5	\$67.00
Technician *	6	\$85.00
Assistant *	7	\$102.00
	8	\$138.00
	9	\$166.00
Staff *	10	\$189.00
	11	\$209.00
Senior	12	\$232.00
	13	\$254.00
Associate	14	\$262.00
	15	\$265.00
	16	\$268.00
	17	\$270.00

NOTES:

1. Position classifications listed above refer to the firm's internal classification system for employee compensation. For example, "Associate", "Senior", etc., refer to such positions as "Associate Engineer", "Senior Architect", etc.
2. For any nonexempt personnel in positions marked with an asterisk (*), overtime will be billed at 1.5 times the hourly labor billing rates shown.
3. For outside expenses incurred by Burns & McDonnell, such as authorized travel and subsistence, and for services rendered by others such as subcontractors, the client shall pay the cost to Burns & McDonnell plus 10%.
4. Monthly invoices will be submitted for payment covering services and expenses during the preceding month. Invoices are due upon receipt. A late payment charge of 1.5% per month will be added to all amounts not paid within 30 days of the invoice date.
5. The services of contract/agency and/or any personnel of a Burns & McDonnell subsidiary or affiliate shall be billed to Owner according to the rate sheet as if such personnel is a direct employee of Burns & McDonnell.
6. The rates shown above are effective for services through December 31, 2022, and are subject to revision thereafter.

F. ADDITIONAL DATA (SCOPE OF WORK)

F. Additional Data (Optional)

We have provided a detailed scope of work immediately following this page.

Scope of Services

Wastewater Treatment Plant Expansion Projects
Design Phase Services
City of Grand Junction

Scope of Services

TASK SERIES 100 – PROJECT MANAGEMENT/GENERAL

Task 101 – Project Management

This task is for internal coordination of the individual disciplines, budget tracking, and invoice preparation.

Task 102 – Project Kickoff Meeting

Engineer shall coordinate and lead a Project Kickoff meeting at the facility. During the Project Kickoff meeting the collective project team shall identify the project goals, coordinate activities, discuss project requirements, establish a project schedule, identify key project issues/concerns, identify key personnel who are to provide input on the project, and get initial input on design items.

Task 103 – Bi-weekly Progress Meetings

Bi-weekly meetings will occur during the design phase through Bidding Assistance and culminating with the acceptance of the GMP from the CMGC Contractor to extend for a period of 15 months.

Task 104 – Quality Control/Quality Assurance

The project team will follow BMcD's QA/QC program. This task includes internal review of the project by qualified staff.

Task 105 – Topographic Survey Assistance

Engineer shall coordinate with a City contracted licensed surveyor to conduct field surveys in sufficient detail to provide a topographic map suitable for detailed design. The survey shall show property boundaries and easements necessary for the project, as well as the location of all utilities and surface features that are likely to affect the project.

Task 106 – Geotechnical Investigation Assistance

Engineer shall coordinate with a City contracted licensed geotechnical firm to conduct soil borings and laboratory tests at key locations as needed to determine subsurface conditions. The geotechnical firm shall provide a geotechnical report with recommendations for the foundation and design of new building(s), basins, site paving, etc.

TASK SERIES 200 – PROCESS EVALUATION

Task 200 – Review of Existing Studies, Reports, Flow/Load Data, & Design Documents

Engineer shall collect and review existing reports/design documents and facility operational data to support our understanding of the facility. This information will be used to generate a baseline for the planning and design of the new upgrades.

Task 201 – Identify Process Options

- ▶ For each of the four areas BMcD will conduct a process evaluation for those processes listed below:
- ▶ Aeration Basin Asset Revitalization and Blower Building
 - The process options that will be included in the review will consist of a variation of blower technology:
 - Turbo Blowers
 - Hybrid Turbo Blowers
- ▶ Disinfection Operational Improvements
 - The process options that will be included in the review will consist of a variation of UV technologies:
 - Horizontal UV systems
 - Vertical UV Systems
 - Angled UV Systems
- ▶ New Dewatering Building and Solids Storage
 - Centrifuges
 - Review 3 vendor supplied systems
 - Chemical Feed Systems
 - Review 3 vendor supplied systems
- ▶ Headworks Improvements
 - Screening Technology
 - Review 3 vendor supplied systems
 - Screening Conveyance
 - Review Shaftless screw systems
 - Review Pleated belt conveyor
 - Screening Wash Press
 - Review 2 vendor supplied systems
 - Grit classifier
 - Review 2 vendor supplied systems

Task 202 – Develop Design Criteria for Each Work Area

Engineer will provide a Basis of Design report that will include the process system sizing requirements as well as building classification that will establish design criteria for access and egress as well as criteria for heating, ventilation, I&C and Power distribution.

The Basis of Design report will be developed in context for submission to the CDPHE in support of the permitting processes for new treatment facilities.

Task 203 – Operator Questionnaires & Workshop

Engineer shall develop a questionnaire for the Owner's operational staff. The goal of the questionnaire is to gather data related to operator preferences and items relating to past operations history and maintenance issues at the existing facility that may be relevant to the design of this facility. Once the questionnaires are completed and returned, Engineer shall conduct a workshop with the Owner's Operational and Engineering representatives to discuss the responses.

Task 204 – Equipment Preferences Workshop & Equipment Site Visits

Engineer shall develop a process equipment seminar for the Owner's operational staff. The goal of the seminar is to provide valuable information on the process equipment options available that may be relevant to the design of this facility. Once the seminar is complete, Engineer shall coordinate site visits to allow the operation's staff to see firsthand the preferred equipment and discuss the pros/cons with other facility's operational staff.

Task 205 – Process Evaluation Summary Technical Memorandum

Engineer shall develop a technical memorandum documenting all the previous tasks in the process evaluation section.

Task 206 – Process Evaluation Summary Technical Memo Review Meeting

Engineer will conduct a final Microsoft Team's online review meeting to discuss the technical memorandum. Comments received by Owner will be considered and incorporated into the final document as appropriate.

TASK SERIES 300 – CONCEPTUAL DESIGN**Task 300 – Conceptual Designs**

- ▶ The conceptual design documentation will include:
- ▶ Aeration Basin Asset Revitalization and Blower Building
 - Drawings which provide plan views and select section views of:
 - Aeration basin modifications to basins 1-4.
 - Modifications to splitter box and gate rehabilitation
 - Modification to aeration grid and associated mixing systems
 - Modifications to existing tankage
 - New Blower building & reconnection of aeration headers
 - New blower building blower layout
 - Concept expansion for new blower building
 - Draft specifications for equipment exceeding \$100,000
- ▶ Disinfection Operational Improvements
 - Drawings which provide plan views and select section views of:
 - Drawings of the modifications to existing chlorine contact channels
 - Addition of new UV systems
 - Modifications to existing UV systems (as required)
 - Draft specification for new UV equipment
- ▶ New Dewatering Building and Solids Storage
 - Concept level drawings which provide plan views and select section views of:

- Dewatering building
 - Centrifuge process area
 - Conveyance systems
 - Truck load out area
 - Chemical storage and fee systems
 - Ancillary rooms
- Draft specifications for centrifuge and other equipment exceeding \$100,000.
- ▶ Headworks Improvements
 - Concept level drawings which provide plan views and select section views of:
 - Headworks floor plan
 - Grit system improvements
 - Conveyance systems
 - Screenings and grit load out area
 - Ancillary rooms
 - Draft specifications for:
 - Screening equipment
 - Screenings wash press
 - Grit classifier
 - Grit and Screenings Conveyance
 - Other equipment exceeding \$100,000.

Task 301 – Conceptual Design Summary Technical Memo

Engineer shall develop a technical memorandum documenting all the previous tasks in the conceptual design section.

Task 302 – Conceptual Design Summary Technical Memo Review Meeting

Engineer will conduct a final Microsoft Team's review meeting to discuss the technical memorandum. Comments received by Owner will be considered and incorporated into the final document as appropriate.

TASK SERIES 400 – PRELIMINARY DESIGN

Task 400– 30% Design Documents

Plans and specifications shall be provided by Engineer at the 30% design level. The 30% Documents shall include the following:

- ▶ Specification Table of Contents
- ▶ Civil Drawings (if necessary)
- ▶ Architectural Drawings (if necessary)
- ▶ Structural Drawings
- ▶ Plumbing Drawings
- ▶ Mechanical Drawings
- ▶ Process Drawings
- ▶ Electrical Drawings
- ▶ Instrumentation and Controls Drawings

The Owner shall be given at least one week to review the plans and outline specifications prior to holding the 30% Design Review Meeting. PDF documents of the plans along with the specifications will be provided to the Owner for review.

The design fee estimate is based on the following primary upgrades at the facility, should any of the upgrades change this will be considered supplemental services and require an amendment:

- ▶ Aeration Basin Asset Revitalization and Blower Building
 - Gate Replacement
 - Modification to aeration basins for:
 - New diffuser grids
 - New drop header locations for grid replacement
 - Modification of 2 of 4 basins replacing pilot study curtains with permanent baffle walls
 - Addition of low head wall pump
 - Electrical modifications to support wall pump
 - Blower Building
 - At grade building design includes:
 - Replacement of PD blowers with high efficiency high speed blowers
 - Reconnection to existing headers accounting for new diffuser grids
 - Heating, ventilation, process mechanical, electrical, I&C supporting the design of the new building.
 - Building material is masonry
 - Assume tall single-story structure, flat roof matching existing building architecture
- ▶ Disinfection Operational Improvements
 - Addition of new UV system
 - Structural support of new system in existing chlorine contact basin
 - Power and I&C design for the new system
- ▶ New Dewatering Building and Solids Storage
 - Design of 2 story dewatering building including:
 - Partially buried Blending tank for primary and secondary solids streams
 - Basement for centrifuge solids feed pumps
 - 1st story loadout bay
 - 1st story chemical storage and feed systems
 - 1st story chemical spill storage
 - New centrifuges, assuming 3 units on 2nd story
 - Conveyance system of dewatered cake to truck in 1st story loadout bay
 - Modification to dewatering feed pumps both primary and secondary solids
 - Process mechanical, electrical, I&C supporting the design of the new building and equipment
 - Heating, ventilation to meet occupancy requirements and discharge to odor control
 - Odor Control: At grade biofilter
 - Building material is masonry, flat roof matching existing building architecture

- Dewatered Cake Solids Storage
 - Pole barn style structure: 30' clear span steel frame
 - Push wall along frame lines and back wall
 - Storage dimension 100'x210'
- ▶ Headworks Improvements
 - Modification to headworks building for:
 - Code compliance egress and separation
 - New HVAC & Power distribution to meet applicable NFPA & NEC codes
 - Replacement of 2 screens
 - Replacement of screenings wash press
 - Replacement of screenings conveyance system
 - Replacement of grit classifiers
 - Process mechanical, electrical, I&C supporting the design of the new building.

Task 401 – 30% Engineer's Opinion of Probable Construction Cost

Based on the 30% design documents, Engineer shall prepare the engineer's opinion of probable cost for the project. This cost opinion will be submitted along with the design documents for review and comment by the Owner. The cost opinion will be based on recent bid tabulation information, current markets, historical cost data, and discussions with local suppliers and contractors. All assumptions will be included for reference.

Task 402 – 30% Design Review Meeting

After the Owner has had an opportunity to review the 30% design documents, Engineer shall conduct a 30% design review meeting. The purpose of this meeting is to provide the Owner and Engineer an opportunity to clarify City comments on the documents. Engineer shall provide meeting minutes with a decision log and a list of action items. Meeting minutes will be distributed via e-mail and document comments will be incorporated into the 60% design documents as appropriate.

TASK SERIES 500 – CM/GC SELECTION

Task 500 – CM/GC Contractor RFP Process

Engineer shall assist the Owner in developing a list of prequalified contractors to propose on the project. The list of prequalified contractors will be developed based on the engineer's knowledge and experience, Owner's input, and contractor's experience in the water/wastewater construction industry.

Owner shall prepare and issue a request for proposal for construction contractor procurement. The proposal documents shall include proposal requirements and the 30% design documents, which shall be of adequate detail to provide construction CONTRACTORS sufficient information to propose a comparative fee to construct the facility.

Engineer will assist the Owner in preparing and distributing the pre-proposal meeting agenda and attend the pre-proposal meeting. The engineer will assist the Owner in any written responses/addenda required after the pre-proposal meeting.

Task 501 – Contractor Interviews & Selection Assistance

The engineer will attend contractor interviews and assist the Owner in the evaluation of the contractor's responses to rank, select and procure the construction contractor.

The engineer will provide a contractor recommendation based on the proposal evaluation and engineer's knowledge and experience.

The engineer will assist the Owner and contractor in preparation of the IGMP based on the 30% design documents. The engineer shall conduct an IGMP review meeting to review and discuss the IGMP development and steps/schedule that need to be accomplished to complete the final design. The IGMP is based on the contractor's experience and judgment and will be used to establish a budget for the project and to make decisions for final design that may include cost considerations.

TASK SERIES 600 – PERMITTING

Task 600 – CDPHE Site Application

Engineer shall develop the Site Application Report that will include all items listed in the Site Application Checklist as published by CDPHE at the time of submittal. Engineer shall submit the Site Application to CDPHE, and address revisions as required by CDPHE to achieve final approval. Owner is responsible for permitting fees to CDPHE.

Task 601 – CDPHE Process Design Report

Engineer shall develop the Process Design Report that will include all items listed in the PDR Checklist as published by CDPHE at the time of submittal. Engineer shall submit the Process Design Report to CDPHE, and address revisions as required by CDPHE to achieve final approval. Owner is responsible for permitting fees to CDPHE.

Task 602 – City, County, & Fire Authority Permitting

Engineer shall submit the required documents to the City, County, & Fire Authority and address revisions as required to achieve final approval. Owner is responsible for permitting fees.

TASK SERIES 700 – DETAILED DESIGN

Task 700 – 60% Design Documents

Plans and specifications shall be provided by Engineer at the 60% design level. The 60% Documents shall include the following:

- ▶ Technical Specifications
- ▶ All drawings indicated in 30% review drawings brought to 60% completion
- ▶ Additional Detail drawings that are needed for final design

The Owner and Contractor shall be given at least one week to review the plans and outline specifications prior to holding the 60% Design Review Meeting. PDF documents of the plans along with the specifications will be provided to the Owner and Contractor for review.

Task 701 – 60% GMP

The engineer will assist the Owner and contractor in preparation of the 60% GMP based on the 60% design documents. The engineer shall attend a 60% GMP review meeting to review and discuss the GMP development and steps that need to be accomplished to complete the final design. The GMP will be used to make decisions for final design that may include cost considerations.

Task 702 – 60% Design Review Meeting

After the Owner and Contractor have had an opportunity to review the 60% design documents, Engineer shall conduct a 60% design review meeting. The purpose of this meeting is to provide the Owner, Contractor, and Engineer an opportunity to clarify comments on the documents. Engineer shall provide meeting minutes with a decision log and a list of action items. Meeting minutes will be distributed via e-mail and comments will be incorporated into the 90% design documents as appropriate.

Task 703 – Major Process Equipment Bidding/Selection

Engineer shall prepare and assist contractor with issuing specifications and drawings to major process equipment manufacturers for competitive bidding solicitation. This task includes issuing specifications & drawings, issuing addenda, proposal formulation and review, assistance with the evaluation and formal selection of major process equipment. The selected major process equipment will be included in the final design documents.

Task 704 – Maintenance of Operations Plan

Engineer shall develop a maintenance of operations plan for each area of the project in collaboration with the Owner and contractor.

Task 705 – 90% Design Documents

Plans and specifications shall be provided by Engineer at the 90% design level. The 90% Plans shall include the following:

- ▶ Refined Technical Specifications
- ▶ All drawings indicated in 60% review drawings brought to 90% completion
- ▶ Additional Detail drawings that are needed for final design

The Owner and Contractor shall be given at least one week to review the plans and specifications prior to holding the 90% Design Review Meeting. PDF documents of the plans will be provided to the Owner and Contractor for review.

Task 706 – 90% GMP

The engineer will assist the Owner and contractor in preparation of the 90% GMP based on the 90% design documents. The engineer shall attend a 90% GMP review meeting to review and discuss the GMP development and steps that need to be accomplished to complete the final

design. The GMP will be used to make decisions for final design that may include cost considerations.

Task 707 – 90% Design Review Meeting

After the Owner and Contractor have had an opportunity to review the 90% design documents, Engineer shall conduct a 90% design review meeting. The purpose of this meeting is to provide the Owner, Contractor, and Engineer an opportunity to clarify comments on the documents. Engineer shall provide meeting minutes with a decision log and a list of action items. Meeting minutes will be distributed via e-mail and comments will be incorporated into the IFB design documents as appropriate.

Task 708 – Issue for Bid Design Documents

Engineer shall prepare and submit Issue for Bid plans and specifications for bidding purposes. The plans and specifications will incorporate final comments prior to bidding.

Task 709 – Bidding or Negotiating Phase

After acceptance by Owner of the final Drawings and Specifications, other Construction Contract Documents, bidding-related documents (or requests for proposals or other construction procurement documents), and upon authorization by Owner to proceed, Engineer shall assist Owner and contractor, as appropriate to bid and develop the final GMP.

Task 710 – Final GMP Development Support

The engineer will assist the Owner and contractor in preparation of the final GMP based on the final design documents. The engineer shall attend a final GMP review meeting to review and discuss the GMP development and approval.

TASK SERIES 800 – DESIGN SUPPORT DURING CONSTRUCTION

Construction is assumed to commence June 2023 and run for 30 months ending the end of December 2025.

Task 801 – CMGC Request for Information

Review and respond to RFIs in writing and prepare and issue supplemental drawings and specifications as necessary in response to RFIs. Maintain an orderly record of all RFIs, responses provided to the contractor, and documentation of each RFI's resolution.

Level of effort is based on a total of 320 RFI's that require an average of 2 hours each for review and response to CMGC contractor. Project Management accounts for an additional 80 hours of support.

Task 802 – Changed Field Conditions

Review and comment on prospective changed field conditions. Evaluate and make recommendations to OWNER on changes when appropriate. Provide Work Change Directives (no cost design changes) as needed. Track changes and obtain OWNER approval prior to returning direction to the contractor.

Level of effort is for documentation of Changed Field Conditions is based on a total of 160 Field Orders that require an average of 2 hours each for development, review, and response / directive to CMGC contractor. Project Management accounts for an additional 80 hours of support.

Task 803 – Attending Construction Progress Meetings

The engineer shall prepare for and attend weekly progress meetings to consult with the OWNER during the construction period relative to general administration of the construction. The engineer will attend construction progress meetings in-person once per month. Level of effort includes travel, meeting attendance and travel expenses.

Additional weekly meetings for each month will be attended virtually. CMGC contractor will develop and conduct these meetings.

**TASK SERIES 900 – ADDITIONAL DESIGN SUPPORT DURING CONSTRUCTION
(NOT INCLUDED PER RFP BUT ASSUME WILL BE AMENDED)**

Construction Observation and Residential Project Representative (Construction Inspection Services)

General Administration of Construction Contract:

Pre-Construction Conference

Compliance Submittals

Work Compliance Site Visits

Special Inspections

Processes Start-Up Assistance

Pre-Start-Up Workshops

Equipment Operation's Training

Operations & Maintenance Manual

Conduct Final Inspection

CDPHE Certifications

Conforming to Construction Record Drawings

ATTACHMENT 1. RESUMES

GREG WOODWARD, PE

Project Manager



Greg has more than 30 years of experience in wastewater treatment, serving as a project manager, delivery manager, lead engineer, technical lead, and quality reviewer. He brings unique and valuable insights to your project, having managed and designed numerous projects at the Persigo WWTP over a period of 18 years. He is extremely familiar

with the facility's layout, its historical operations, and challenges, having managed the planning, design, and construction of a dozen projects at the facility. Throughout the development of the design concepts and final contract documentation, Greg worked closely with plant staff to understand current challenges, desired operational flexibility and maintaining project budgets.

EDUCATION

- ▶ BS, Civil Engineering
- ▶ BS, Physics

REGISTRATIONS

- ▶ Professional Engineer (CO, UT)

1 YEAR WITH BURNS & MCDONNELL

31 YEARS OF EXPERIENCE

UV Disinfection at Persigo WWTP* | City of Grand Junction

Grand Junction, Colorado

Project manager. The City wanted to evaluate the use of UV disinfection for the Persigo WWTP. Safety concerns with storing and handling the large ton cylinders along with the costs associated with chlorine and future process impacts were the driving factors. The evaluation showed that UV had substantial benefits which prompted the retrofit design of the chlorine contact basins. One vendor was pre-selected providing the design layout a very specific approach. Redundancy was built into the process and met CDPHE design requirements.

Persigo Wastewater Treatment Facility Headworks Improvement* | City of Grand Junction

Grand Junction, Colorado

Project manager. The headworks improvement project included an evaluation of alternative screening and screening conveyance equipment for the 12.5-mgd wastewater treatment facility. Evaluation included climber single rake screens, multiple rake screens, band screens and step screens. Alternatives considered for conveyance of screened material included open tray belt conveyors, pressed tray belt conveyors and shaftless screws. The final design incorporated a new step screen.

Persigo Wastewater Treatment Facility BNR Full Scale Pilot Study* | City of Grand Junction

Grand Junction, Colorado

Project manager. Following the elimination of the City's Combined Sewer system collection system City staff wanted to reevaluate the capacity and treatment capabilities of the present facility. A study of alternative process options was completed and recommended the development of a full-scale pilot study to evaluate the operation of the aeration system reconfigured to a Modified Johannesburg process scheme. A key element was the involvement of the Colorado Department of Public Health and Environment in the planning and conducting of the pilot study.

Persigo Wastewater Treatment Plant Primary Anaerobic Digester Cover Improvements* | City of Grand Junction

Grand Junction, Colorado

Project manager. The City's primary anaerobic digester gas mixing system has passed its design life and was no longer operational. Assisted in the evaluation of different mixing system alternatives, ultimately selecting a linear motion mixer to

GREG WOODWARD, PE

(continued)

replace the gas mixing system. In addition, improvements to the cover included structural reinforcing, a new guide rail system, replacement of existing sludge and gas piping, cover rehabilitation and repainting of the cover.

Springfield Headworks and Aeration Improvements | City of Springfield Springfield, Missouri

Design Manager responsible for the coordination of design elements and information exchange to the project manager and the City. His team met the schedule requirements set forth by the client. The Southwest WWTP is experience a series of operational challenges with peak flows exceeding 100 MGD and aging infrastructure and equipment. The improvements covered under this work are a revitalization of headworks equipment, HVAC, screening and material handling, grit classification and FOG management. Throughout the plant, there are 52 controls gates that will also be replaced.

Persigo Wastewater Treatment Facility Upgrade Study* | City of Grand Junction Grand Junction, Colorado

Project manager. The study reviewed several specific areas of operation within the Persigo WWTP for development of a unified approach to upgrade the existing facility providing for higher operational efficiencies throughout the WWTP. The WWTP is a 12.5-mgd activated sludge treatment plant that utilizes both aerobic and anaerobic digestion for solids processing. Disinfection is accomplished by gaseous chlorine followed by dechlorination using sulfur dioxide. The study focused on six areas: 1) the liquid stream process systems and potential conversion to a nitrification/denitrification treatment facility, 2) an energy audit of the existing power supply systems, 3) analyze the existing anaerobic biogas uses and identify alternative technology or internal system uses for a higher efficiency usage consumption, 4) evaluate the existing facility controls systems, 5) and evaluate the disinfection system and benefits of converting to UV disinfection.

Persigo WWTP – Solids Digestion Master Planning and Facility Improvements* | City of Grand Junction Grand Junction, Colorado

Project manager. Completed an evaluation and Master Plan for the development of options for the City's treatment facility's aerobic digestion facilities. The treatment facility is a 12.5-mgd activated sludge treatment plant that utilizes both aerobic and anaerobic digestion for solids processing. The aerobic digestion is used for the Waste Activated Solids from the secondary clarifiers. Through growth the Aerobic digestion system has not been able to meet the demands for treatment of the secondary solids. Reviewed process modifications, expansion of the current system, options to convert to 100% anaerobic digestion, in and out of basin thickening and a wholesale conversion to another end use market. Short term recommendation of a Dissolved Air Flotation thickening system that met each of the process scenarios desired by the City.

Persigo Wastewater Treatment Facility Diffuser Outfall Upgrade* | City of Grand Junction Grand Junction

Project principal for a new diffuser outfall. The nutrient study indicated a significant value of constructing a new diffuser outfall into the Colorado River provided a greater economic benefit than what would be required for process upgrades needed for continue discharging into Persigo Wash considering future Regulation 85 and Regulation 31 compliance. In turn a design of approximately 2000 LF of new 48" diameter effluent pipeline, including a 240 LF of 60" trenchless boring under I-70, and a 67 LF outfall diffuser with 17 ports in the Colorado River was completed.

*Denotes projects prior to joining Burns & McDonnell



ANDREW WADDOUPS, PE

Design Manager



Andrew is a senior process design engineer with 26 years of experience and a focused technical background in wastewater treatment. His WWTP design experience includes multiple technologies, including (but not limited to) MBR, IFAS, BNR oxidation ditch, and SBR. Andrew has served as the project manager and/or lead

process engineer for WWTP retrofit and expansion projects across the Front Range. He has recent progressive design-build, construction manager at risk, and other alternative delivery method experience.

EDUCATION

- BS, BioResource Engineering

REGISTRATIONS

- Professional Engineer (CO, NJ, SD, WY)

14 YEARS WITH BURNS & MCDONNELL

26 YEARS OF EXPERIENCE

TDS Compliance Project | Cherokee Metropolitan District

Colorado Springs, Colorado

Project manager for the Cherokee WWTP TDS Reduction Project. The Cherokee WWTP discharges to an alluvial aquifer. The discharge permit includes a total dissolved solids (TDS) limit of 400 mg/L, which cannot be met without a TDS reduction process step. The project team converted the existing 4.8 MGD sequencing batch reactor secondary process into a membrane bio-reactor followed by reverse osmosis to reduce TDS. The project also includes a new headworks for fine screening ahead of the MBR process.

Boxelder Wastewater Treatment Facility Expansion | Boxelder Sanitation District

Fort Collins, Colorado

Project manager for the expansion of the Boxelder WWTP. The District has seen significant development in their service area which has driven the need for expansion. The project doubles the phased isolation BNR secondary treatment process trains and brings the facility capacity to 4.6 MGD and 10,000 lbs of influent organic capacity. The project also includes upgrades to the headworks/grit systems, a new UV disinfection system, and aerobic digestion with slow-speed dewatering.

Stonegate Wastewater Facility Upgrades | Stonegate Village Metro District

Parker, Colorado

Project manager for the alternative evaluation study, preliminary and final design of the Stonegate Village WWTF Upgrade project. Stonegate currently has a 0.05 ppm phosphorus limit and 10 ppm T.I.N. limit. The evaluation phase found that significant upgrades would be needed to allow the facility to reliably meet the stringent effluent limit requirements. The final design includes fine screening following the existing headworks, influent pumping, an A2O-membrane bio-reactor secondary process, aerobic digestion of bio-solids, bio-solids dewatering and UV light disinfection.

Plum Creek Wastewater Treatment Facility Expansion | Plum Creek Water Reclamation Authority

Castle Rock, Colorado

Project manager for the capacity expansion of the Plum Creek WWTP from 6.4 to 9.5 MGD. The primary purpose of the project is the capacity expansion and replacement of the solids stabilization system with an Autothermal Thermophilic Aerobic Digestion process (ATAD) process to create Class A biosolids. The process includes the reactor tanks, aerated and large bubble mixed WAS tank, thickening processes, and transfer pumping systems. The project also included replacing the

ANDREW WADDOUPS, PE

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existing headworks/grit and UV disinfection systems, adding a 12 MGD (peak) continuous up-flow sand filter to meet the 0.05 mg/L phosphorous effluent limit, and addition of odor control.

Fort Lupton Wastewater Treatment Facility Expansion | City of Fort Lupton

Fort Lupton, Colorado

This project includes permitting, design, procurement, and construction services for the retrofit and expansion of the Ft. Lupton WWTP, expanding its treatment capacity to 3.1 MGD. This project adds a second process train, new headworks, new disinfection system, and renovation of the solids stabilization and dewatering systems to the WWTP.

Wastewater Treatment Plant | Boxelder Sanitation District

Fort Collins, Colorado

Project manager and lead process engineer for the Boxelder Sanitation District's new mechanical wastewater treatment plant. The project was completed using the design/contract-build project delivery format and includes a new treatment facility on an existing site. The Boxelder Wastewater Treatment Facility includes a new headworks (i.e., screening and grit removal), a new influent pump station, biological nutrient removal (i.e., nitrogen and phosphorus) using continuous loop reactor (i.e., oxidation ditch) secondary treatment, UV light disinfection, effluent pumping, and biosolids storage. The new mechanical plant will replace an aerated lagoon treatment system. Additional facility components include a laboratory upgrade and full site development including influent piping, electric, communications, and storm water management. The oxidation ditch system was procured prior to the final design phase allowing optimization of the design and minimization of overall project costs. The scope of services included all design aspects of the project including facility planning, preliminary design, process and ancillary equipment design, preparation of contract documents, coordination with local building and fire departments and other state and local government agencies, and general contractor selection assistance.

Williams-Monaco Wastewater Treatment Plant BNR Upgrades | South Adams County Water and Sanitation District

Henderson, Colorado

Project manager for the South Adams County Water & Sanitation District's BNR upgrade planning and design for the 8.0 MGD Williams Monaco Facility. The facility upgrade project was initiated due to a compliance order to meet ammonia limits for the next discharge permit cycle. In addition, the Facility must meet the Regulation 85 limits for phosphorous and total inorganic nitrogen (1.0, 15 mg/L respectively on a yearly average). The final design converts the existing MBBR secondary process to Integrated Fixed Film Activated Sludge (IFAS) in an A2O configuration for biological phosphorous removal as well as nitrogen reduction. A new grit system is incorporated ahead of the existing primary clarifiers, and a new UV light disinfection system replaces the gas chlorination disinfection process. The project adds a new secondary process train, three secondary clarifiers, large bubble mixing, and high-speed turbo blowers for aeration. This project won an ACEC 2017 Colorado Engineering Excellence Award.

Wastewater Treatment Facility Expansion | City of Green River

Green River, Wyoming

Project manager for the replacement of the existing lagoon system with a 1.5 MGD BNR mechanical plant. The new facility includes a complete treatment process with headworks/grit, BNR secondary process, UV disinfection and aerobic digestion. The dewatering system uses a slow speed screw press for dewatering and the biosolids are composted with City yard waste to reach Class A status. The effluent goals for the facility include biological phosphorous removal below 1 mg/l and TIN below 7 mg/L.



KEVIN WADDELL, PE, DBIA

Cost Estimator



Kevin brings 27 years of experience working as a lead estimator, project manager, district manager and preconstruction manager on water and wastewater infrastructure projects. He has served as the preconstruction and estimating manager for projects throughout the U.S. including several award-winning projects recognized by industry organizations. In this role, he is responsible for developing the cost model, work scopes, scope gap analysis, subcontractor and supplier solicitations, review and selections, coordination between design-estimating construction teams, and final project construction costs. Kevin is also a certified Associate Design-Build Professional (Assoc. DBIA) and leverages this experience to apply design-build best practices and standards to every project.

EDUCATION

- ▶ BS, Civil Engineering

REGISTRATIONS

- ▶ Designated Design/Build Professional
- ▶ Professional Engineer (KS)

2 YEARS WITH BURNS & MCDONNELL

28 YEARS OF EXPERIENCE

Ft. Lupton WWTP Upgrades | City of Fort Lupton

Fort Lupton, Colorado

Preconstruction Manager and Lead Estimator. Provided Quality Control reviews for the project that will expand the WWTP to 3.1 MGD and 7,700 lbs BOD5/day. A new headworks and grit removal system is included ahead of a new biological nutrient removal secondary process train. A new UV disinfection system treats all wastewater before it leaves the site. The centrifuge dewatering system was replaced with a slow-speed screw press for dewatering. Preconstruction manager responsible for estimating strategy, estimate & WBS development, constructability reviews, assist with schedule development, sub-supplier solicitations, risk assessment, and estimate accuracy.

Englewood SPWRP Consulting – Improvements to SPR WWTP | City of Englewood

Englewood, Colorado

Preconstruction Manager and Lead Estimator. Provided preconstruction services to the South Platte Renew agency for the review of a cost estimate for a CMAR contract to construct various civil and electrical improvements at the SPR WWTP. Work included cost estimate analysis, value engineering ideas, constructability reviews, and risk and contingency reasoning to help SPR reduce the cost of the project. Successfully helped SPR reduce the cost of the project from ~\$12.5 mil to ~\$9.25 mil which met their budget and allowed the project to move forward.

Morrison WTP Expansion | Mount Carbon Metropolitan District

Colorado

Preconstruction Manager and Lead Estimator. Mount Carbon Metropolitan District is a special district, responsible for supplying water and wastewater services to the Red Rocks Ranch development. The District partnered with the Town of Morrison to expand the Town's water treatment plant. The WTP draws its raw water from a blend of Bear Creek and the Cooley Reservoir. The existing pretreatment basin is undersized and leads to operational challenges. The existing membrane filtration system does not have redundancy. The site is remote, difficult to access and very sloped. The proposed design includes an expansion to the exiting pretreatment building. New pretreatment basins and chemical facilities will be installed. Two additional membrane trains will be installed for additional capacity and redundancy. The existing chlorine contact basin

KEVIN WADDELL, PE, DBIA

(continued)

will remain in service with a new high service pump installed. Project tasks include water modeling, jar testing for iron, manganese and uranium removal and cost estimating. Led the preconstruction and estimating for Phase 1 of the progressive design build contract. Developed the detailed scope of work, constructability reviews, cost estimating, managed subcontractor and supplier solicitations, reviewed subcontractor proposals and held scope review meetings, conducted a scope gap evaluation, developed the project risk register along with the contingency cost and completed the 30% milestone lump sum, fixed price cost estimate.

UV Disinfection 2020 | City of Savannah, Missouri

Savannah, Missouri

Preconstruction Manager and Lead Estimator. Led the preconstruction and estimating for Phase 1 of the progressive design build contract. Developed the detailed scope of work, constructability reviews, cost estimating, managed subcontractor and supplier solicitations, reviewed subcontractor proposals and held scope review meetings, conducted a scope gap evaluation, developed the project risk register along with the contingency cost and completed the final lump sum, fixed price cost estimate. The final lump sum, fixed price cost estimate was within the City's budget. The level of detail for an estimate based on 30% design documents exceeded their expectations and the Ph 2 design build price was approved.

Phase I Wastewater Treatment Plant | City of Marshall, Missouri

Marshall, Missouri

Preconstruction Manager and Lead Estimator. Led the preconstruction and estimating services for Phase 1 of the progressive design build project for the City of Marshall, MO at the WWTP. Work included detailed scope development, cost estimating, constructability review, construction scheduling, risk and contingency analysis for the ~\$9 mil project. Owner approved the Phase 1 construction cost estimate so detailed design and updated cost estimate at 30% can be developed for City.

Wichita Northwest Water Treatment Facility | City of Wichita

Wichita, Kansas

Preconstruction services. Provided preconstruction work in Ph 1 of the progressive design build including the review and analysis of the cost estimate for the final GMP for the new ~\$500 mil water treatment plant. Assisted the estimating team to successfully develop the GMP that was approved by the City of Wichita.

Todd Creek Wastewater Treatment Plant Facility Plan | City of Kansas City

Kansas City, Missouri

Preconstruction manager. Developed a facility plan for the existing Todd Creek Wastewater Treatment Plant, including evaluation of the condition and capacity of the existing facility, and an evaluation of future capacity and water quality needs. Evaluated multiple alternatives for improvements to the facility as well as new greenfield options. A final recommendation is to be provided including a 30-percent design in a BIM format, a Level 4 cost estimate, and recommendations regarding appropriate project execution models. The new facilities are anticipated to have a construction value between \$30M and \$50M. Managed the development of Class IV cost estimates for multiple options to upgrade the Todd Creek WWTP for the City of Kansas City, MO. The estimates were used by the City to help determine which design option to choose for the plant upgrade. Provided accurate, conceptual estimating with enough detail to allow the City to select the best treatment plant design option based on operation and maintenance, price and schedule.



BRETT PUGH, PE

Quality Control



Brett is a senior project manager and professional civil engineer with more than 20 years of experience in project management, design, and construction, collaborative project delivery, and process commissioning. His design experience includes wastewater treatment, water treatment, distribution, and collection. Brett's wastewater treatment facility design experience includes new

facilities and expansions using a variety of treatment technologies, including (but not limited to) conventional activated sludge, biological nutrient removal, sequencing batch reactors, UV disinfection, and sludge dewatering. He works with clients to holistically evaluate options for facility expansions based on their water quality goals, redundancy needs, budget, ease of future expansion, and ease of operations/ maintenance.

EDUCATION

- ▶ BS, Civil Engineering

REGISTRATIONS

- ▶ Professional Engineer (CO, TX)

3 YEARS WITH BURNS & MCDONNELL

23 YEARS OF EXPERIENCE

Options Assessment for the Grand Junction Water Supply | City of Grand Junction

Grand Junction, Colorado

Project manager. This study identified twelve alternatives for the City's water supply, considering water rights, availability, treatability, water quality, O&M, purchase costs and customer satisfaction. The alternatives incorporated various conveyance and treatment process options, including lime-softening, granular media filtration, membrane filtration, reverse osmosis, water pumping and transmission, hydroelectric generation, river intake, chloramination and break-point chlorination. Conceptual cost estimates were developed for each alternative. A paired-comparison analysis was completed using non-monetary criteria to qualify the benefit: cost ratio of each option. The study identified the preferred alternative based on these criteria. Brett interfaced with the client; was responsible for schedule, quality, and on budget delivery; and provided technical oversight.

Boxelder WWTP Expansion | Boxelder Sanitation District

Fort Collins, Colorado

Project manager for the expansion of the Boxelder WWTP during the construction phase, and **project engineer** during design phase. The District has seen significant development in their service area which has driven the need for expansion. The project doubles the phased isolation biological nutrient removal BNR secondary treatment process trains and brings the facility capacity to 4.6 MGD and 10,000 lbs of influent organic capacity. The project also includes upgrades to the headworks/grit systems, a new UV disinfection system, and aerobic digestion with slow-speed dewatering. The project is currently in construction using a CMAR delivery model and will be complete in August 2021.

Plum Creek Water Reclamation Facility Expansion | Plum Creek Water Reclamation Authority

Castle Rock, Colorado

Process review for the expansion of the Plum Creek Water Reclamation Facility to 10 MGD. Included new headworks (screen modifications, new stacked tray grit removal), influent pumping, WAS thickening, tertiary filtration, UV disinfection and conversion to ATAD aerobic digestion. The process evaluation included hydraulic profile, process flow diagram, equipment selection, sizing and layout, pipe sizing, yard piping and operational review.



BRETT PUGH, PE

(continued)

Meyer Ranch Water Reuse Facility* | Randolph Todd Company Near New Braunfels

Comal County, Texas

Design engineer for a 0.39 MGD wastewater treatment plant using a membrane bioreactor and UV disinfection. Meyer Ranch is a new master planned community outside of New Braunfels. TCEQ requires a high-quality effluent because the wastewater facility is in the sensitive Edwards Aquifer Recharge Zone. Included a membrane bioreactor, UV disinfection and storage and distribution of Type I reclaimed water for irrigation. The pre-treatment facility consisted of redundant rotary drum fine screens, bypass screening and flow equalization tank. The equalization tank was sized to minimize peak hour and maximum daily flow rates to the MBR system to remain in compliance with TCEQ filtration rates. All tanks were covered to mitigate potential impact on adjacent homeowners. Acted as the treatment plant lead, working a larger engineering team providing full engineering services for the entire development.

Central Colchester WWTF Upgrade* | Municipality of the County of Colchester

Truro, Nova Scotia, Canada

Project manager for a \$12 million upgrade to an existing 7.4 MGD wastewater plant. The upgrade was required to expand the capacity and improve effluent quality. The upgrade included a new raw water screening facility, addition of flow equalization tank, addition of a third sequencing batch reactor (SBR), addition of UV disinfection facility, new aeration blowers, flow control upgrades and a new plant wide SCADA system. Construction was completed, and new process units implemented without interruption to the continuous operation of the facility. Administered the construction contract for the municipality and coordinated the commissioning. \$12M.

Arcola WWTP Expansion* | City of Arcola

Arcola, Texas

Project manager for the expansion of an existing conventional activated sludge plant to 0.75 MGD. Included a new aeration basin, multi-stage centrifugal blower, clarifier, recycle sludge pump, chlorine contact tank and site drainage improvements. Delivered on a reduced schedule to meet private funding deadlines associated with occupancy of a new residential development. Included a minor permit amendment to re-rate the facility based on historic low organic loading, resulting in a higher hydraulic capacity for the same amount of installed equipment. Approximate project cost \$1.7M.

Windmill Farms WWTP* | Kaufman County Fresh Water Supply District

Forney, Texas

Design engineer for the expansion of a packaged wastewater treatment plant from 0.6 to 1.2 MGD ultimate capacity. Historical data analysis during the permit amendment showed the plant was under-loaded hydraulically but overloaded biologically. Prepared a permit re-rate application and the resulting design, which added an aeration basin for the higher organic load. Included sludge dewatering using a static filter container to improve plant operations and reduce sludge disposal costs. During the permit amendment, TCEQ determined that discharge greater than 0.84 MGD would require treatment to background levels (zero discharge). Alternative discharge locations were investigated, and a regional lift station option was selected to send flows to the neighboring City of Forney for treatment. An interim expansion to 0.84 MGD was designed to provide service until the regional lift station and force main were available. This expansion requires extended aeration volumes for full nitrification, clarification, a new mechanical fine screen and a tertiary filter for organic and phosphorus removal. The existing lift station was replaced with a new lift station, sized for the ultimate capacity. \$6M.

*Denotes experience prior to joining Burns & McDonnell.



ANDREW TOTH, PE, ENV SP

Lead Process Engineer



Andrew is a process design engineer who focuses on wastewater engineering. He has extensive experience with multi-disciplinary team coordination and leadership in technical and non-technical environments, both domestically and internationally. He has worked on several projects with municipal water and wastewater treatment facilities. His specialized interests lie in design of

wastewater treatment facilities, sustainability, water reuse and resource recovery.

TDS Compliance Project | Cherokee Metropolitan District

Colorado Springs, Colorado

Design engineer that prepared a hydraulic grade line. The Cherokee WRF discharges to an alluvial aquifer. The discharge permit includes a total dissolved solids (TDS) limit of 400 mg/L, which cannot be met without a TDS reduction process step. The project team converted the existing 4.8 MGD sequencing batch reactor secondary process into a membrane bio-reactor followed by reverse osmosis to reduce TDS. The project also includes a new headworks for fine screening ahead of the MBR process.

Plum Creek Wastewater Treatment Facility Expansion | Plum Creek Water Reclamation Authority

Castle Rock, Colorado

Process design engineer. Worked on the Plum Creek wastewater treatment facility expansion. Rapid growth along the Front Range of the Rocky Mountains has forced several cities and municipalities to expand their infrastructure's carrying capacity. The Plum Creek Water Reclamation Authority in Castle Rock, Colorado (immediately south of Denver) is no exception. The Authority hired Burns & McDonnell on a Construction Manager At Risk (CMAR) contract to design and provide construction management services for the expansion of the Boxelder WWTF in Fort Collins, Colorado. The plant expansion increases the plant capacity from 6.4 to 9.5 MGD. Major improvements include bringing a third oxidation ditch online, designing a new headworks building with improved grit removal, replacing existing disc filters with up flow sand filters, and replacing the existing aerobic digestion process with an ATAD process. Responsible for design of the up-flow sand filter building and system, chemical feed system improvements, and solids handling pump design. In this capacity, performed design calculations for these three plant components, and prepared final drawings and specifications related to these systems. Throughout the design and construction process, he worked together with Parkson, the equipment supplier, so they could supply the 35 up flow sand filters required for the job.

Boxelder Wastewater Treatment Facility Expansion | Boxelder Sanitation District

Fort Collins, Colorado

Design engineer. Worked on a CMAR contract for facility design and construction to expand the capacity from 3.0 to 4.6 MGD. As several other cities and municipalities along the Rocky Mountain Front Range have experienced growth, Fort Collins has seen a dramatic influx of new residential and commercial construction in the last 5-10 years. Boxelder Sanitation District in Fort Collins originally chose Burns & McDonnell in 2010 to design a new Wastewater Treatment Facility featuring oxidation ditches. Major improvements include adding two new oxidation ditches (doubling the current number of

EDUCATION

- ▶ MS, Environmental Engineering
- ▶ MS, Technology Management
- ▶ BS, Civil Engineering

REGISTRATIONS

- ▶ Professional Engineer (CO)
- ▶ Envision SP (MO)

7 YEARS WITH BURNS & MCDONNELL

7 YEARS OF EXPERIENCE

ANDREW TOTH, PE, ENV SP

(continued)

oxidation ditches) with a new RAS and WAS pump station, installing a second mechanical screen, replacing the existing vortex grit removal with a head cell grit removal unit, expanding the existing UV disinfection capacity, designing two new aerobic digester cells, and designing a completely new solids dewatering facility. Authored the Preliminary Engineering Report outlining Burns & McDonnell's general design of the WWTF expansion for Colorado's Department of Health and Environment. Responsible for design of the new aerobic digesters, solids handling building and systems, solids handling pump design, the WAS pumping system, and all yard piping for the plant. Performed all required design calculations and prepared final drawings and specifications for his respective sections of the project. During construction, responsible for responding to submittals and RFIs related to the solids processes and piping at the plant.

Fort Lupton Wastewater Treatment Facility Expansion Site Application & Expansion | City of Fort Lupton

Fort Lupton, Colorado

Author of site application and process engineer. Worked on the site application for permitting with Colorado Department of Public Health and the Environment (CDPHE). The project is an expansion of the City of Fort Lupton's Wastewater Treatment Facility from 2.75 MGD to 3.1 MGD. In addition to writing the site app and producing all accompanying figures, completed all necessary formwork for the State to be able to approve this project. This project adds a second process train, new headworks, new disinfection system, and renovation of the solids stabilization and dewatering systems to the WWTP.

Wastewater Treatment Facility Expansion | Green River

Green River, Wyoming

Process design engineer. Worked on a new wastewater treatment facility plant. The City of Green River, Wyoming owns and operates a wastewater treatment lagoon plant. A 2015 facility condition report indicated that almost all major components of the plant are in dire need of replacement. City officials indicated a need for an updated plant to meet future NPDES permit requirements. The new plant consists of two oxidation ditches with aerobic digestion. All facilities at the plant will be new, including headworks (screening and grit removal), anaerobic phosphorus selectors, the two oxidation ditches, UV disinfection, aerobic digesters, and solids handling. The new plant shall have a capacity of 1.5 MGD. After working with the City to help develop future flows and loads, wrote the Engineering Design Report for permitting of the plant through Wyoming's Department of Environment and Conservation. Responsible for design of the aerobic digesters, solids handling building and systems, solids handling pumps, and yard piping for the plant. In this capacity, performed all required design calculations, designed the facility's yard piping plan, and developed final drawings and specifications for his respective parts of the plant.

Wichita Integrated Water and Sanitary Sewer Master Plan | City of Wichita

Wichita, Kansas

Process engineer. Worked on a wastewater masterplan. The City of Wichita regularly takes stock of all water and wastewater assets to determine where their money is best spent. Drafted the report for upgrades to one of the City's five wastewater treatment facilities. Described the existing infrastructure and equipment at Plant 3 (Cowskin Creek) WWTP, summarized recommended upgrades, and calculated preliminary design sizing for future upgrades to meet the City's projected growth in coming years.



ADAM BOGUSCH, PE, ENV SP

Process Modeling



Adam has more than 26 years of design and process modeling experience on water, wastewater, and environmental treatment projects. His process skills include BioWin and Plan-It Stoat process models and he is skilled at hydraulic evaluations. Adam has been involved in a number of innovative projects using advanced treatment

technologies and various bio-nutrient removal approaches. He has developed engineering reports, contract documents, technical specifications, construction cost opinions, energy audits, operation & maintenance manuals, and design drawings for the bid and construction of water, wastewater, and environmental treatment and remediation projects. Throughout his career he has filled the role of project manager, design manager, project engineer, and developer on traditional design-bid-build (DBB) and alternative delivery projects with values over \$100M. Adam's responsibilities have included pre-design, project scheduling and scoping, team supervision, engineering design, inter-discipline coordination, construction phase services and document preparation, quality assurance, regulatory correspondence and coordination, and resource management.

EDUCATION

- ▶ MS, Environmental Health Engineering
- ▶ BS, Civil Engineering

REGISTRATIONS

- ▶ Envision SP
- ▶ Professional Engineer (IA, KS, MI, MO, NE, OK, TX, WI)

5 YEARS WITH BURNS & MCDONNELL

26 YEARS OF EXPERIENCE

TDS Reduction at Cherokee WRF | Cherokee Metropolitan District

Colorado Springs, Colorado

BioWin modeler and process engineer. The Cherokee WWTP discharges to an alluvial aquifer. The discharge permit includes a total dissolved solids (TDS) limit of 400 mg/L, which cannot be met without a TDS reduction process step. The project team converted the existing 4.8 MGD sequencing batch reactor secondary process into a membrane bio-reactor followed by reverse osmosis to reduce TDS. The project also includes a new headworks for fine screening ahead of the MBR process. Adam's role include BioWin process modeling, biological treatment system process design, blowers and automated aeration

Chetolah Creek Wastewater Resources Recovery Facility (WRRF) Design-Build Improvements | City of Hays

Hays, Kansas

Lead process designer and BioWin modeler. The original wastewater treatment facility in Hays, Kansas was constructed in 1953 and, after more than 60 years, faced impending effluent water quality requirements that the existing trickling filter and aeration basin process could not properly address. The City desired to use design-build to implement the needed improvements within a tight construction schedule and budget. Unique aspects of this design include secondary treatment with a cyclic aeration system to achieve less than 8.0 mg/L total nitrogen (TN). Total phosphorus (TP) reduction is achieved through a combination of biological and chemical processes. A post aerated zone was included to comply with increasingly stringent effluent ammonia requirements. Another unique aspect of the project included the construction of a new influent lift station installed through caisson construction to minimize site disruptions. Almost 100% of the average flow through this facility will be available for reuse after being treated through new effluent filtration and disinfection systems.

ADAM BOGUSCH, PE, ENV SP

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Hutchinson UV Aeration Phase I | City of Hutchinson, Kansas

Hutchinson, Kansas

Project manager. This was the third phase of a design-build effort for the City of Hutchinson Wastewater Treatment Facility (WWTF). It included replacement of a ~30-year-old ultraviolet (UV) disinfection system with modern technology to reduce the risk to operations a new system was proposed to replace the old vertical bulb configuration. A Trojan UV 3000+ was selected for installation. The new disinfection system was installed in an existing building and only two channels of the four existing channels were required for the new technology. Installation was coordinated through discussions with the KDHE and existing permit requirements to reduce the risk of discharge quality compliance. In addition to greatly reducing risks of operation, the City has observed significant energy cost savings through the more efficient, modern, equipment.

Hutchinson Wastewater Facility Planning Study | City of Hutchinson, Kansas

Hutchinson, Kansas

Project manager. The City of Hutchinson maintains and operates 33 wastewater lift stations and one wastewater treatment facility (WWTF). The plant currently treats an average flow of approximately 5 MGD and is permitted for 8.3 MGD. Many of the wastewater treatment facility components are more the 50 years old and are reaching the end of their life expectancy putting plant operations at risk. Adam was the Project Manager for this study, which included an assessment existing processes and equipment as well as a regulatory review to assess future risks to operations. Alternatives focused on key areas of the plant and collection system that presented a risk to the success of the utility, including the grit removal system, influent and intermediate pumping, secondary treatment, UV disinfection, digester structures and biosolids disposal options. Projected costs were developed and recommendations were made based on an assessment of the CIP program and planned rate increases in the collection system. Contingency planning was provided to assist operations staff in maintaining processes and responding to potential failures during the period prior to proposed improvements. Burns & McDonnell and our construction partner were selected to implement critical improvements at the site in a design-build approach. These included modifications to alleviate the need for an intermediate pump station for plant influent, construction of a new UV disinfection system, and aeration system improvements for an activated sludge system achieving nitrogen reduction.

Springfield Southwest Wastewater Treatment Plant Preliminary Engineering Report | City of Springfield, Missouri

Springfield, Missouri

Project manager. This multi-faceted project that included analysis of multiple components at the 64 mgd Southwest WWTP. The focus of the work included evaluation of potential energy conservation opportunities, but also encompassed improvements in other areas including partial nutrient removal strategies and sidestream nutrient reduction opportunities. While the study focused on energy efficiency projects, other needs were also evaluated. Process improvements considered included new aeration system design, addition of process controls and evaluation of Annamox sidestream treatment alternatives. Portions of the recommendations, as well as major improvements to the existing headworks facility, are currently being designed by Burns & McDonnell.

Treatment Facilities and Pump Station Condition Assessment and Upgrades | Johnson County Wastewater

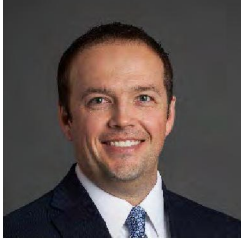
Mission, Kansas

Project team. Burns & McDonnell worked with Johnson County Wastewater (JCW) to develop and implement capital improvement needs at the Rock Creek Pump Station as well as the 75th & Nall and Martway Peak Excess Flow Treatment Facilities (PEFTFs). Components at these facilities were in some cases, more than 50 years old and exceeded their designed operating lifetime. Condition and future capacity needs drove updates and improvements for continued performance during wet weather events. Adam's responsibilities included QA/QC for the design package.



BRIAN KNADLE, PE, ENV SP

Technical Advisor



Brian is a project manager and senior process engineer with experience covering a broad range of municipal and industrial wastewater/industrial wastewater projects. He has been responsible for managing, planning, permitting, designing, and constructing these projects. Brian has extensive experience in treatment process selection and plant optimization.

Wastewater Treatment Facility Upgrade | Stonegate Village Metropolitan District

Parker, Colorado

Lead process engineer for the alternative evaluation study, preliminary and final design of the 1.1 MGD Stonegate Village WWTF Upgrade project. Stonegate currently has a 0.05 ppm phosphorus limit and 10 ppm T.I.N. limit. The evaluation phase found that significant upgrades would be needed to allow the facility to reliably meet the stringent effluent limit requirements. The final design included fine screening following the existing headworks, influent pumping, an A2O-membrane bio-reactor secondary process, aerobic digestion of bio-solids, bio-solids dewatering and UV light disinfection. The construction was completed using the Design-Contract-Build format with a guaranteed maximum price.

BNR Process Upgrade at Williams Monaco WWTP | South Adams County Water and Sanitation District

Henderson, Colorado

Lead process engineer for the South Adams County Water & Sanitation District's BNR upgrade planning and design for the 8.0 MGD Williams Monaco Facility. The facility upgrade project was initiated due to a compliance order to meet ammonia limits for the next discharge permit cycle. In addition, the Facility must meet the Regulation 85 limits for phosphorous and total inorganic nitrogen (1.0, 15 mg/L respectively on a yearly average) which will be include in the next permit cycle. The final design converted the existing MBBR secondary process to Integrated Fixed Film Activated Sludge (IFAS) in an A2O configuration for biological phosphorous removal as well as nitrogen reduction. A new grit system was incorporated ahead of the existing primary clarifiers, and a new UV light disinfection system replaced the gas chlorination disinfection process. The project added a new secondary process train, three secondary clarifiers, and high-speed turbo blowers for aeration.

Wastewater Treatment Plant Improvements Design-Build Project | City of Emporia, Kansas

Emporia, Kansas

Project manager. This is a design-build project that includes plant-wide upgrades to increase nutrient removal capabilities at the WWTP, including influent screening upgrades; replacing influent pumps; replacing the existing vortex grit system with a stacked, multi-tray system; converting the existing secondary treatment from conventional activated sludge and trickling filters to Integrated Fixed-film Activated Sludge; replacing the existing PD blowers with high-speed turbo blowers; replacing the IR, RAS, and WAS pumping systems; replacing the secondary clarifier mechanisms; installing alum and supplemental carbon chemical feed systems; converting the existing anaerobic digestion system into an aerobic digestion system; and installing a recuperative thickening system.

EDUCATION

- ▶ MS, Civil Engineering
- ▶ BS, Civil Engineering

REGISTRATIONS

- ▶ Envision SP
- ▶ Professional Engineer (CO)

13 YEARS WITH BURNS & MCDONNELL

13 YEARS OF EXPERIENCE

BRIAN KNADLE, PE, ENV SP

(continued)

Wastewater Treatment Plant | Boxelder Sanitation District

Fort Collins, Colorado

Lead process engineer. Brian worked on the Boxelder Sanitation District's new 3.0 MGD mechanical wastewater treatment plant. The project is being completed using the design/contract-build project delivery format and includes a new treatment facility on an existing site. The Boxelder Wastewater Treatment Facility includes a new headworks (i.e., screening and grit removal), a new influent pump station, biological nutrient removal (i.e., nitrogen and phosphorus) using continuous loop reactor (i.e., oxidation ditch) secondary treatment, UV light disinfection, effluent pumping, and biosolids storage. The new mechanical plant will replace an aerated lagoon treatment system. Additional facility components include a laboratory upgrade and full site development including influent piping, electric, communications, and storm water management. The oxidation ditch system was procured prior to the final design phase allowing optimization of the design and minimization of overall project costs. The scope of services included all design aspects of the project including facility planning, preliminary design, process and ancillary equipment design, preparation of contract documents, coordination with local building and fire departments and other state and local government agencies, and general contractor selection assistance.

Plum Creek Wastewater Treatment Facility Expansion | Plum Creek Water Reclamation Authority

Castle Rock, Colorado

Design manager. Brian was responsible for coordinating the multi-discipline design team that designed the capacity expansion of the Plum Creek WWTP from 6.4 to 9.5 MGD. The primary purpose of the project is the capacity expansion and replacement of the solids stabilization system with an Autothermal Thermophilic Aerobic Digestion process (ATAD) process to create Class A biosolids. The process includes the reactor tanks, aerated and large bubble mixed WAS tank, thickening processes, and transfer pumping systems. The project also included replacing the existing headworks/grit and UV disinfection systems, adding a 12 MGD (peak) continuous up-flow sand filter to meet the 0.05 mg/L phosphorous effluent limit, and addition of odor control.

Montrose Wastewater Treatment Plant Design-Build | City of Montrose

Montrose, Colorado

Process engineer responsible for the onsite startup for the City of Montrose's 4.3 MGD Wastewater Treatment Plant Improvements Project. The project was completed using the design-build project delivery format and included a new third continuous loop reactor (i.e., CLR or oxidation ditch), a new secondary clarifier, a new RAS/WAS pump station, and other miscellaneous plant improvements. The RAS/WAS pump station was designed to incorporate a future fourth process train.

Pierre Wastewater Treatment Plant Upgrades | City of Pierre

Pierre, South Dakota

Project manager. Brian was responsible for client interface and managing scope, schedule and budget.

Fort Lupton Wastewater Treatment Facility Expansion | City of Fort Lupton

Fort Lupton, Colorado

EPC project manager. Brian is responsible for client interface and managing scope, schedule and budget. This project includes permitting, design, procurement, and construction services for the retrofit and expansion of the Ft. Lupton WWTP, expanding its treatment capacity to 3.1 MGD. This project adds a second process train, new headworks, new disinfection system, and renovation of the solids stabilization and dewatering systems to the WWTP.



JAKE KUNTZ

Contractor Liaison



Jake has gained diverse construction industry knowledge and experience, performing various duties on engineering and construction projects. Specifically, Jake has been responsible for project management, negotiating contracts, contract management, procurement, bidding, estimating, scheduling, submittals, RFIs, quality control testing and inspection, construction oversight,

change management, project controls, design reviews, project planning, project execution, and project closeout. Jake has experience with multiple project delivery methodologies including CM-at-Risk, design/CM-at-Risk, design-build/engineer-procure-construct (EPC), design-bid-build, CM-as-Agent, Integrated Program Management, and Program Manager-at-Risk.

EDUCATION

- ▶ Masters, Construction Management
- ▶ BS, Civil Engineering

REGISTRATIONS

- ▶ LEED Accredited Professional

6 YEARS WITH BURNS & MCDONNELL

16 YEARS OF EXPERIENCE

Fort Lupton WWTP Upgrades | City of Fort Lupton

Fort Lupton, Colorado

EPC project manager. Provided quality control reviews for the project that will expand the WWTP to 3.1 MGD and 7,700 lbs BOD5/day. A new headworks and grit removal system is included ahead of a new biological nutrient removal secondary process train. A new UV disinfection system treats all wastewater before it leaves the site. The centrifuge dewatering system was replaced with a slow-speed screw press for dewatering. Responsible for engineering management, project controls, procurement, planning, execution strategy, safety, scheduling, QA/QC, contract/subcontract administration, estimating, budgeting, document control, change management, risk management, client service management, and cost control. This position required coordination among field staff as well as home office operations.

Maple Grove WTP Solids Handling Addition | The Consolidated Mutual Water Company

Lakewood, Colorado

Construction Manager. Responsible for project controls, procurement, planning, execution strategy, safety, scheduling, QA/QC, contract/subcontract administration, estimating, budgeting, document control, change management, risk management, client service management, cost control and project close-out. This position required coordination among field staff as well as home office operations.

Wastewater Treatment Plant Improvements FEP II | Confidential Client

Amboy, Illinois

Senior EPC construction manager. Our completed preliminary design services of \$17MM worth of improvements to an existing WWTP to add a downstream aerobic treatment process to further degrade organics and allow for discharge to a surface water. We also provided preliminary construction planning and estimating services to assist the client with capital planning and future construction phasing, and worked with the client to evaluate potential design changes in order to meet budgetary constraints. Jake was responsible for project controls, procurement, planning, execution strategy, safety, scheduling, QA/QC, contract/subcontract administration, estimating, budgeting, document control, change management, risk management, client service management, cost control and project close-out. This position required coordination among field staff as well as home office operations.

JAKE KUNTZ

(continued)

Wastewater Treatment Plant Upgrades | Confidential Client

South, U.S.

Construction manager. Engineering services for a pie optimization project. Responsible for project controls, procurement, planning, execution strategy, safety, scheduling, QA/QC, contract/subcontract administration, estimating, budgeting, document control, change management, risk management, client service management, cost control and project close-out. This position required coordination among field staff as well as home office operations.

Wastewater EQ and Screening Improvements | Confidential Client

Salina, Kansas

Senior EPC construction manager. The scope of work included design-build delivery of improvements to an existing WWTP, including: Burns & McDonnell was consulted to replace the equalization (EQ) system while minimizing impacts to the pizza production facility. An engineer/procure/construct (EPC) delivery method was selected to expedite equipment procurement and construction. Detailed design included: two 150,000 gallon stainless steel EQ tanks; two 500 gpm, 15 HP centrifugal pumps; two 225 gpm, 10 HP centrifugal pumps; one 1500 gpm rotary drum screen; ancillary valves, piping and controls; and two new PLCs. Jake was responsible for project controls, procurement, planning, execution strategy, safety, scheduling, QA/QC, contract/subcontract administration, estimating, budgeting, document control, change management, risk management, client service management, cost control and project close-out. This position required coordination among field staff as well as home office operations.

Wastewater Treatment Plant FEP | Confidential Client

Salina, Kansas

Senior EPC construction manager. Responsible for project controls, procurement, planning, execution strategy, safety, scheduling, QA/QC, contract/subcontract administration, estimating, budgeting, document control, change management, risk management, client service management, cost control and project close-out. This position required coordination among field staff as well as home office operations.

Morrison CO WTP Expansion | Mt. Carbon Metropolitan District

Colorado

Construction manager. Responsible for project controls, procurement, planning, execution strategy, safety, scheduling, QA/QC, contract/subcontract administration, estimating, budgeting, document control, change management, risk management, client service management, cost control and project close-out. This position required coordination among field staff as well as home office operations. The proposed design of this project includes an expansion to the exiting pretreatment building. New pretreatment basins and chemical facilities will be installed. Two additional pressurized membrane trains will be installed for additional capacity and redundancy. The existing chlorine contact basin will remain in service with a new high service pump installed. Project tasks also included cost estimating.

Water Conveyance Project | Confidential Client

Confidential Location

Construction project manager. Jake worked on the Water Conveyance System project, which consisted of a river intake structure using five (5) cone screen intakes; raw water pump station consisting of five (5) 110 hp submersible pumps; treatment facility consisting of inclined plate settlers, sludge collection system, five (5) 400 hp vertical turbine pumps, and three (3) two-million-gallon sedimentation ponds; and 14 miles of 36" fusion welded HDPE pipe. Jake was responsible for the safety, quality, project schedule, budget, procurement and construction of the intake, treatment, and pipeline installation.



DALE PEARCE

Resident Project Representative



Dale has more than 30 years of experience in the construction industry, performing the duties of project manager, construction manager, preconstruction manager, superintendent, estimator, project engineer, and field engineer on various projects ranging in size up to \$260 million. He specializes in all aspects of water

and wastewater treatment plant construction and site remediation, and has used conventional, design/build, design/build/operate and design/ build/ operate/ finance delivery methods. His vast experience with project controls, scheduling, contract writing and administration, constructability reviews, change order negotiations, subcontractor management, equipment procurement, and cost controls makes him a great addition to any project.

EDUCATION

- ▶ BS, Construction Management

REGISTRATIONS

- ▶ Project Management Professional

6 YEARS WITH BURNS & MCDONNELL

32 YEARS OF EXPERIENCE

Plum Creek Wastewater Treatment Facility Expansion | Plum Creek Water Reclamation Authority

Castle Rock, Colorado

Resident engineer construction observer. Project included utility planning, permitting, and detailed design and construction phase services for a 3 MGD capacity expansion at the PCWRA WRF. It will relocate the headworks to install a new influent pumping system, reuse the existing screening equipment, and install a new stacked-tray grit concentrator and grit washer/classifier/dewatering unit. The existing tertiary cloth disc filters will be replaced by an upflow continuous backwashing filter system for phosphorous trimming. The existing horizontal UV disinfection equipment will be replaced by an inclined UV disinfection system. The solids handling system will be converted from the existing aerobic digestion system to an ATAD system. Role included review of RFI's, Changes, submittals. Construction observation and coordination with facility, Utilities and Engineering Successfully coordinated Engineering and Construction teams that kept project moving forward. Reduced delays by accelerating the response to RFI's and changes throughout the project.

Plum Creek WPF Advanced Treatment Project | Town of Castle Rock, Colorado

Castle Rock, Colorado

QA and QC reviewer. Our team provided design and construction phase services for the addition of advanced treatment processes to the 6 MGD Plum Creek Water Purification Facility. The design included the addition of raw water blending, biological filtration, advanced oxidation, UV, granular activated carbon, and residuals handling. Q6 Reviewer Worked with Design Team on Q6 comments to determine impact and changes required. Discussed reasons for comments and past experiences that related to comments to help team members grow in knowledge about construction and how it relates to design.

Maple Grove Water Treatment Solids Handling | The Consolidated Mutual Water Company

Lakewood, Colorado

Construction support. Worked in many roles to assist the team in completing design, bidding and construction setup. Assisted in design reviews and equipment bid package assembly and review of bids. Schedule setup and review. Project was setup to be successful through construction and startup

DALE PEARCE

(continued)

Biogas Facility* | Confidential Client

Colorado

Project Manager. The \$64M EPC project is an anaerobic digester facility located in Colorado. The organic wastes (feedstock) include cow manure from dairy operations and other organic residuals ("Substrate") from the surrounding metropolitan area (grease traps, waste food products, etc.). The process of using cattle manure, food wastes and other organic wastes as feedstock for the digester facility will preclude release of pollutants to the environment, and specifically, will reduce the emission of significant amounts of greenhouse gas, to the atmosphere. The methane gas (CH₄) generated by this process will be injected into the Gas pipeline with a block valve for interconnection near the Project Site. In addition to generating a needed domestic energy source, the facility will produce a dewatered solids portion that can be used as a compost product in agriculture, land reclamation, landscaping, turf topping, gardening, nursery operations, greenhouses, erosion prevention, and erosion mitigation. This facility required a new 25 KVA service from an existing outdated substation 6 miles from the facility. Mr. Pearce managed the design and construction of this facility. He was responsible for the overall budget, schedule, vendor contracts and subcontracts. He also coordinated with the Owner and electrical & gas utilities and Government approval agencies to keep project on schedule.

Pumping and Filtration System at Denver Construction Site | Shea Properties

Denver, Colorado |

Construction manager. Worked on an Engineer-Procure-Construct (EPC) services scope of work that includes ground water pumping and treatment system to discharge the water into the municipal sewer system. Mr. Pearce was responsible for the overall costs, coordination, subcontract administration, client invoicing and progress of the project.

pH Adjustment System | TOLMAR Inc.

Fort Collins, Colorado

Construction manager. Worked on an Engineer-Procure-Construct (EPC) services scope of work that includes the design and construction of a skid pH adjustment system for pharmaceutical waste stream allowing the final waste to be discharged into the municipal sewer system. Dale was responsible for the overall costs, coordination, subcontract administration, client invoicing and progress of the project.

North Complex Electrical, Instrumentation, and Controls Upgrade Project | Denver Water

Denver, Colorado

Construction manager for an Engineer-Procure-Construct (EPC) services scope of work that includes electrical services, power distribution, control systems, and SCADA connections for a raw water facility consisting of five reservoirs. Facilities included water intake, flumes, infrastructure between the reservoirs, and outlet structure. The EPC project includes design, procurement, construction, and construction phase services. Worked with design team to assist in reviews and scheduling to complete design on time and underbudget. Manage and coordinate subcontractors and Owner activities. Managed project budget and schedule. Project completed on time and under budget.

**Denotes experience prior to Burns & McDonnell*



KEVAN THURMAN, PE, SE

Structural Engineer



Kevan is a structural engineer with specialized experience in structural design of various process structures for both clean water and wastewater treatment, as well as support building structures. He has experience in all phases of a project, from project budgeting and planning, to complete structural design, all the way through construction administration and project closeout. He also

serves as one of the BIM Managers for the Denver Office, overseeing and managing the 3D content used to develop project deliverables.

TDS Compliance Project at WRF | Cherokee Metropolitan District

Colorado Springs, Colorado

Structural engineer. Our team provided progressive design-build services to convert the existing 4.8 MGD sequencing batch reactor secondary process at the Cherokee WRF into a membrane bio-reactor followed by reverse osmosis to reduce TDS. The project also includes a new headworks for fine screening ahead of the MBR process.

Boxelder Wastewater Treatment Facility Expansion | Boxelder Sanitation District

Fort Collins, Colorado

Structural engineer of record. Worked on design of expansion to the existing Boxelder Wastewater Treatment Plant. Managed a team of 5 structural engineers, delegating and overseeing tasks required to complete the project. Developed BIM standards for the project and coordinated with different disciplines to ensure proper execution. Coordinated closely with the project manager and design team to ensure a successful design.

Stonegate Wastewater Facility Upgrades | Stonegate Village Metro District

Parker, Colorado

Structural engineer. Worked on the design of steel pipe supports for suspended yard piping and interior process piping. Reviewed and approved various construction submittals and shop drawings. Performed on-site special inspections for all concrete and masonry structures. Reported on daily construction activities and answered RFI's sent by the contractor.

Ft Lupton WWTP Upgrades | City of Fort Lupton

Fort Lupton, Colorado

Structural and architectural lead. Provided Quality Control reviews for the project that will expand the WWTP to 3.1 MGD and 7,700 lbs BOD5/day. A new headworks and grit removal system is included ahead of a new biological nutrient removal secondary process train. A new UV disinfection system treats all wastewater before it leaves the site. The centrifuge dewatering system was replaced with a slow-speed screw press for dewatering. Lead Structural Engineer and Structural Engineer of Record on project. Coordinated structural and architectural design with project team. Assisted construction team with procurement and bidding. Helped develop a unique retrofit solution for expanding an existing oxidation ditch.

EDUCATION

- ▶ MS, Civil Engineering
- ▶ BS, Civil Engineering

REGISTRATIONS

- ▶ Professional Engineer (CO, WY, WA, MT)
- ▶ Professional Structural Engineer (HI, OK)

9 YEARS WITH BURNS & MCDONNELL

13 YEARS OF EXPERIENCE

KEVAN THURMAN, PE, SE

(continued)

Williams-Monaco Wastewater Treatment Plant BNR Upgrades | South Adams County Water and Sanitation District Henderson, Colorado

Structural engineer. Worked on the design of new concrete clarifier tanks, a new masonry grit removal structure with precast concrete roof, a new concrete splitter structure with grit separator and a new masonry UV filtration structure with precast concrete roof. Evaluated existing structures for modifications to be performed as part of the upgrade process. Designed modifications to existing concrete process trains for installation of new UV filtration system. Used 3D BIM software to coordinate structural designs between multiple disciplines involved in the project. Reviewed construction submittals, shop drawings and performed various required special inspections.

Wastewater Treatment Facility Expansion | City of Green River Green River, Wyoming

Structural engineer of record. Worked on new wastewater treatment plant. Collaborated with the Project Manager to develop conceptual modeling as part of the project proposal. Developed 3D renderings for client review. Managed initial set up of the BIM execution plan, setting the standards that would be used for the project. Coordinated with civil and process engineering teams to layout project site. Performed layout and design of a combined dewatering and UV building. Managed team of three structural engineers and coordinated with other disciplines to complete the design.

Infrastructure Improvements | South Adams County Water and Sanitation District Englewood, Colorado

Structural engineer of record. Designed and detailed various retrofit projects for the existing Williams Monaco Wastewater Treatment Plant and Lift Station #2. Projects included designing a precast concrete roof structure for an existing equalization basin, installing a manway hatch into an existing digester and replacing an existing digester seal. Developed specs and drawings for the project. Performed construction observations and special inspections as the owners engineer throughout construction of the project.

Broomfield Water Treatment Plant Expansion | City and County of Broomfield Broomfield, Colorado

Structural engineer of record who performed condition assessment of existing water treatment plant to help client with conceptual design of improving the plant capacity. Compiled assessment results into a design report to be used by the client for determining feasibility of upgrading the plant. Carried assessment results into design of new filters as an expansion of the existing structure and two new chemical feed buildings for the plant. **Structural engineer of record** on plant expansion facilities. Performed construction observations and code required special inspections, serving as the owners engineer throughout construction of the project.

Morrison CO WTP Expansion | Mt. Carbon Metropolitan District Morrison, Colorado

Structural engineer. Our team provided design-build services for an expansion to the existing pretreatment building at the Morrison WTP. New pretreatment basins and chemical facilities will be installed. Two additional membrane trains will be installed for additional capacity and redundancy. The existing chlorine contact basin will remain in service with a new high service pump installed.



RYAN LANG, RA, ENV SP

Architect



With more than 16 years of experience in the field of architecture, Ryan has served as the lead project architect on a variety of municipal, industrial, commercial and public building projects. His involvement includes project management, construction administration, design, fast-tracked design-build, the preparation of the architectural plans and specifications, and 3D design.

EDUCATION

- ▶ BS, Architecture

REGISTRATIONS

- ▶ Envision SP: Registered Architect (AR, CO, FL, GA, IL, KS, LA, MO, NE, OK, SD, TN, TX, WY)

11 YEARS WITH BURNS & MCDONNELL

16 YEARS OF EXPERIENCE

TDS Compliance Project | Cherokee Metropolitan District

Colorado Springs, Colorado

Architect. The project involves new construction of three buildings, masonry and metal building, to house process equipment and chemical storage. The project team converted the existing 4.8 MGD sequencing batch reactor secondary process into a membrane bio-reactor followed by reverse osmosis to reduce TDS. The project also includes a new headworks for fine screening ahead of the MBR process.

Boxelder Wastewater Treatment Facility Expansion | Boxelder Sanitation District

Fort Collins, Colorado

Architect. Worked on a multi-structure, wastewater treatment facility to increase capacity of the existing wastewater treatment plant. The project involves design of a new headworks facility, oxidation ditch, secondary clarifiers, UV disinfection system, modified river discharge, aerobic digesters, dewatering system, and composting facility. Responsibilities include architectural design of all above ground structures at the facility.

Pierre Wastewater Treatment Plant Upgrades | City of Pierre, South Dakota

Pierre, South Dakota

Architect of record. Architect of Record for renovations and upgrades to a multi-structure, wastewater treatment facility in the City of Pierre. Project involves design of a new influent lift station, administration building upgrades, and modifications to an existing headworks facility. Responsibilities include architectural design of all above ground structures at the facility.

Wastewater Treatment Plant Improvements Design-Build Project | City of Emporia

Emporia, Kansas

Lead architect. Ryan is currently serving as the Lead Architect for the planning, design, and construction services for the 5-MGD Wastewater Treatment Improvement project. Improvements include construction of a new double-wythe masonry Process Building and Administration Building, miscellaneous building improvements in existing buildings around the site, and installation of high-performance coatings. The Process Building includes a chemical room, electrical room, grit room and process area. The Administration Building has a standing seam metal roof and includes a laboratory, breakroom, operator room, office, men's and women's restrooms, locker room and shower, storage, and mechanical/electrical rooms.



RYAN LANG, RA, ENV SP

(continued)

Freeburg Wastewater Treatment Plant & Collection System Improvements | Village of Freeburg, Illinois

Freeburg, Illinois

Project architect and architect of record. As part of the design overhaul to the existing WWTP, the project includes all new facilities for both liquids and solids processing, a new SCADA and communications system, and a new administration space. The biological treatment is provided by a cyclic aeration system with retrievable diffusers to create the necessary anoxic and aerobic conditions to promote nitrogen reduction. An anerobic basin precedes the cyclic aeration process to achieve biological phosphorus removal. The process can be controlled either through a timer system or by an automatic optimization program that uses a combination of in-basin dissolved oxygen and ORP instruments. The team used dynamic biological modeling to simulate the conditions at the plant and predict effluent quality. Ryan was the architect for the new construction Screening and Filter masonry buildings, as well as process canopies, on the Freeburg WTP to house the screening and filtering processes. Both buildings are made up of double wythe masonry walls with a room for wastewater processes and another room for electrical equipment. The project involved making drawings, specifications, and code plans. A PEMB was used as the shell for their new administrative building that houses a breakroom/conference room, office, lab, locker room, restroom and shop.

Wastewater Treatment Plant Improvements | City of Arkansas City

Arkansas City, Kansas

Lead architect. Responsible for the design of a new Water Treatment Plant and Administration Building. The WTP was a 27,000 SQFT precast tilt up paneled building on a steel frame. The Admin Building was a 4,000 SQFT brick veneer cavity wall masonry building with a limestone wainscot. Membrane roofing over ridged insulation was used on the WTP and a Standing seam metal roof was used over the Admin Building. The WTP consisted of a process area, two chemical rooms, electrical and mechanical rooms. The Admin building was made up of a training room, men's/women's restrooms, reception, locker room, office, plan room, laboratory, and control room. There are two overhead bridge cranes in the WTP. The Admin Building was designed to harvest diffused natural daylight.

Macon Wastewater Treatment Plant Headworks | City of Macon, Missouri, Macon Municipal Utilities

Macon, Missouri

Architect of record and lead design architect. Ryan Lang is the lead architect for the Headworks and Influent Pump station improvements in Macon, Missouri. The project's architectural scope included the design of a new headworks building, which includes an electrical room and screening room. The building will be a single level with double wythe walls, an overhead door, and passage doors. In the screening room, there will be two channels with two screens, and room for two future screens. Translucent panel skylights and translucent panel wall panels will align with the channels and screens for future removal and replacement, and to bring daylight into the building. There will also be room for an FRP platform to access process equipment, and a dumpster adjacent to the overhead door so a truck can empty it. Ryan facilitated the design through drawings and specifications. The project is currently under construction.

Millcreek WWTP Improvements 20 | Johnson County Wastewater

Shawnee, Kansas

Architect of record and lead design architect. Provided a detailed condition assessment, recommendations for improvements, and design of improvements for the Mill Creek WWTP. Improvements included new grit handling, odor control, and flow control assets. Also included replacement of existing VFDs for new and misc site improvements to help the site continue to function in advance of a larger overall plant improvements program. Ryan was the architect for the JCW Mill Creek WWTP improvements project. The architectural scope involved replacing a hoist and coatings specifications.



SHAWN DALGLISH, PE

Architectural



Shawn is a civil and structural engineer with five years of experience in water project design and construction. Her project experience varies from project conceptual design, project planning, and detailed design of concrete, masonry, and steel structures. Shawn has worked on several existing facility expansions as well as new facility design

and construction. She also has a background in architectural and interior design. Shawn is proficient in several structural and architectural design drafting software applications including RISA 3D, Visual Analysis, Revit, AutoCAD, and Photoshop.

EDUCATION

- ▶ ME, Civil/Structural Engineering
- ▶ BS, Civil Engineering

REGISTRATIONS

- ▶ Professional Engineer (CO)

5 YEARS WITH BURNS & MCDONNELL

5 YEARS OF EXPERIENCE

TDS Compliance Project at Water Reclamation Facility | Cherokee Metropolitan District

Colorado Springs, Colorado

Design Architect for the TDS Reduction Facility Project. Performed Code Review and analysis of the new structures on site including the Filter Building, Chemical Building, and Headworks Building. Coordinated building department review with local authorities. Performed Hazardous Materials analysis for the Chemical Building. Worked with the Engineering Project Manager and the client to match the exterior aesthetic of the new buildings to existing buildings at the facility. Reduced the overall construction cost of the project by working with the regional building department to approve two variances from the jurisdiction's stringent energy code requirements.

Boxelder Wastewater Treatment Facility Expansion | Boxelder Sanitation District

Fort Collins, Colorado

Structural design engineer and architect. Worked on a multi-structure, wastewater treatment facility to increase capacity of the existing wastewater treatment plant. The project involves design of a new headworks facility, oxidation ditch, secondary clarifiers, UV disinfection system, modified river discharge, aerobic digesters, dewatering system, and composting facility. Responsibilities include structural and architectural design of all above ground structures at the facility.

Plum Creek Wastewater Treatment Facility Expansion | Plum Creek Water Reclamation Authority

Castle Rock, Colorado

Structural design engineer and architect. Worked on the expansion and upgrade of the existing Plum Creek Water Reclamation Facility. The project involved the addition of a new process building which includes a headworks facility, thickening system, pump room, ThermAer tanks, and separate UV disinfection facility. Responsibilities included structural and architectural design of the above and below grade structures for the project.

Pierre Wastewater Treatment Plant Upgrades | City of Pierre

Pierre, South Dakota

Design architect. Worked on renovation and upgrades to a multi-structure, wastewater treatment facility in the City of Pierre. Project involves design of a new influent lift station, administration building upgrades, and modifications to an existing headworks facility. Responsibilities include architectural design of all above ground structures at the facility.



SHAWN DALGLISH, PE

(continued)

Wastewater Treatment Facility Expansion | City of Green River

Green River, Wyoming

Structural design engineer and architect. Worked on a multi-structure, wastewater treatment facility to replace the existing wastewater treatment plant. Project involves design of a new headworks facility, oxidation ditch, secondary clarifiers, UV disinfection system, modified river discharge, aerobic digesters, dewatering system, and composting facility. Responsibilities include structural and architectural design of all above ground structures at the facility.

Pressure Zone 3 Expansion: Gregory Hill Pump Station and Tanks | City of Westminster

Westminster, Colorado

Structural design engineer and architect. Worked on the new Gregory Hill Pump Station as part of the two 3 MG above ground tank and pump station project. The facility is part of a large pressure zone expansion project that will increase water storage capacity and water pressure within Zone 3 of the City of Westminster's water distribution system. Responsibilities include structural and architectural design and construction phase services for the pump station

Lynn R. Morgan Water Treatment Plant Expansion | Town of Erie

Erie, Colorado

Structural design engineer and architect. Worked on the expansion of the Lynn R. Morgan Water Treatment Facility in Erie, Colorado. The project will increase the water treatment plant capacity from 9.9 to 16.7 MGD to serve increasing growth in the town. The project involves design of an additional pretreatment facility, the addition of new filtration membranes, additional yard piping and an increase in pump capacity. Responsibilities include structural and architectural design of the new pretreatment facility.

Dodd WTP Hydroelectric Project | Left Hand Water District

Niwot, Colorado

Structural design engineer. Worked on a new hydro turbine facility to be part of the overall water treatment plant capacity increase. The project purpose is to install a new hydro turbine on a new water line to be connected to the DODD Water Treatment Plant. The new hydro turbine will reduce flow into the plant while converting excess pressure into electricity. Responsibilities include foundation design, facility design, and structural design to accommodate vibrations of the turbine.

West Side Pump Stations [Countryside and Zone 5] | City of Westminster

Westminster, Colorado

Structural design engineer and architect. Worked on the new West Side Pump Station as part of the 3 MG water storage tank rehabilitation and pump station project. The facility is part of a large pressure zone expansion project that will increase water storage capacity and water pressure within Zone 3 of the City of Westminster's water distribution system. Responsibilities include structural and architectural design of the pump station as well as construction phase services for the project.

Erger's Pond Augmentation Stations | City of Brighton

Brighton, Colorado

Structural design engineer. Worked on the Augmentation Station at Erger's Pond. The project will utilize the existing reservoirs in Brighton to augment water supply out and fill with free river water to maximize raw water supply on hand for the surrounding community.



MICHAEL JOHNSON, PE

Instrumentation & Controls Engineer



Michael is a senior electrical and controls engineer. He has worked as a field engineer assisting in startup commissioning and system integration of control systems for industrial facilities and as a consulting engineer to develop conceptual designs, detailed designs, and specifications for electrical & control systems for municipal facilities.

Plum Creek Wastewater Treatment Facility Expansion | Plum Creek Water Reclamation Authority

Castle Rock, Colorado

Electrical/I&C engineer. Provided project support to the construction contractor for a wastewater treatment facility designed by Burns and McDonnell. Reviewed and revised the project cable schedule and electrical drawings, responded to Contractor RFI's, worked with Utility and Client to resolve compliance items.

Pierre Wastewater Treatment Plant Upgrades | City of Pierre

Pierre, South Dakota

Electrical/I&C engineer. Coordinated multiple engineers for the design of Construction Contract documents and specifications for the electrical control system for a wastewater facility. Coordinated the new design to integrate with the existing plant infrastructure.

Wastewater Treatment Facility Expansion | City of Green River

Green River, Wyoming

Electrical/I&C engineer. Coordinated multiple engineers for the design of Construction Contract documents and specifications for the electrical control system for a wastewater facility. Reviewed the department standard specifications for suitability for the type of contract., Reviewed the department standard specifications for suitability for the type of contract.

Ft Lupton WWTP Upgrades | City of Fort Lupton

Fort Lupton, Colorado

Electrical/I&C engineer. Provided detailed electrical design documents and construction EPC specifications and construction sequence planning for the upgrade of a single train wastewater facility to add an additional train and include future planning for a third train.

Maple Grove WTP Solids Handling Project | The Consolidated Mutual Water Company

Lakewood, Colorado

Lead electrical/I&C engineer responsible for the conceptual design, specifications and detailed design of the 480 VAC 3-phase electrical system including panels and cables for the lighting, mixing tanks, feed pumps, polymer skids and dewatering press skids power distribution. The overall scope of this project is solids handling improvements to an existing water treatment plant based on recommendations our team made during the previous solids study. The solids study included a detailed solids production evaluation, bench scale dewatering testing, pilot testing, and development of design alternatives for converting the existing system from drying beds to mechanical dewatering. Our team designed the plant improvements based on this study and is currently constructing the improvements.

EDUCATION

- ▶ BS, Electrical Engineering

REGISTRATIONS

- ▶ Professional Engineer (CO, KS, SD, WY)

20 YEARS WITH BURNS & MCDONNELL

20 YEARS OF EXPERIENCE

MICHAEL JOHNSON, PE

(continued)

Actuator Replacement at Wes Brown WTP | City of Thornton

Thornton, Colorado

Electrical/I&C engineer. Provided work packages for the replacement of hydraulic actuators to a construction partner. Provided minimal design with sufficient instruction to contractor for critical components to minimize engineering expenses.

Dodd WTP Hydroelectric Project | Left Hand Water District

Niwot, Colorado

Electrical/I&C engineer. Revised the electrical design of a hydro turbine located at the base the front range, to meet utility company requirements and performed compliance submittal reviews.

First Creek Lift Station Improvements | City of Aurora

Denver, Colorado

Electrical/I&C engineer. The First Creek Lift Station will be abandoned once a new interceptor to a new Metro North WWTP is completed. Until that time, the lift station will pump both the Second and First Creek flows to the existing Aurora WWTP. This project increases the capacity of the FCLS to 3.0 MGD to handle the flows from both service areas. This project retrofitted the existing submersible lift station with large pumps, updated controls, new flow meter, and a bypass vault connection. The project also added a new 50' antenna mast and SCADA monitoring that communicates to the City's main monitoring system. Electrical detailed design specifications and drawings, Contract submittal reviews and construction support, answered RFI's, Attended Client Workshop & Factory Acceptance Testing. We were able to create an updated standard set of Burns and McDonnell contract drawings to meet City of Auroras preferred methods and procedures. We were able to incorporate SCADA Design manual and to meet very specific product interface and product testing requirements.

Skyline Pump Station Interconnect | City of Longmont

Longmont, Colorado

Electrical/I&C engineer. In order to meet emergency indoor water demands, the City of Longmont accepts intermittent water supplies from surrounding districts via interconnects in their system. In order to move this emergency interconnect water throughout their water distribution system, Burns & McDonnell designed an emergency interconnect in an existing pump station consisting of an end suction pump, piping, and associated updates to electrical and HVAC. The Burns & McDonnell team has also assisted the City with construction observations and inspections. Provided construction work package for the City to self-perform the work. Addition of a zone-to-zone variable frequency drive transfer pump. Provided minimal design requirement, with sufficient critical design components.

Rock Creek Lift Station Odor Control Improvements | City and County of Broomfield, Colorado

Englewood, Colorado

Electrical/I&C engineer. Provide a Construction Contract specifications and detailed design drawings to replace the pump station pumps, MCC and to add odor control equipment. Specifically outlined a Construction sequence for the pump station to stay online while performing the work.

Cooley East Pump Station | City of Thornton, Colorado

Thornton, Colorado

Electrical/I&C engineer. Revised a pump station design, provided control narrative, specifications and drawing revisions. Answered Construction RFIs, and participated in factory acceptance test, site visits and walkdown.



VAMSI PATWARI, PE

Electrical Engineer



Vamsi is an electrical engineer with six years of experience in electrical design, analysis, and project coordination. He has specialized experience in industrial power and control systems.

Plum Creek Water Reclamation Facility Expansion | Plum Creek Water Reclamation Authority

Castle Rock, Colorado

Electrical engineer that performed the evaluation and design of the closed transition emergency power system. This project includes the capacity expansion of the Plum Creek WWTP from 6.4 to 9.5 MGD. The primary purpose of the project is the capacity expansion and replacement of the solids stabilization system with an Autothermal Thermophilic Aerobic Digestion process (ATAD) process to create Class A biosolids.

Green River Wastewater Treatment Plant Expansion | City of Green River

Green River, Wyoming

Electrical engineer and instrumentation/controls for expansion to the existing Green River Wastewater Treatment Plant. The project includes the replacement of the existing lagoon system with a 1.5 MGD BNR mechanical plant. The new facility includes a complete treatment process with headworks/grit, BNR secondary process, UV disinfection and aerobic digestion.

Wastewater Treatment Plant Inspection and Engineering | City of Longmont

Longmont, Colorado

Electrical engineer. Consulted with the Longmont WWTP regarding service water pressure, modifications to the biological treatment system, and pump design/replacement. Vamsi worked on a study to evaluate the existing emergency generators at both the Nelson Flanders Water Treatment Plant and the Longmont Wastewater Treatment Plant. The evaluation includes increasing the existing generator run times, new ATS/MTS, sectionalizer, and fuel storage. The study involved developing options for emergency power, evaluating each with monetary and non-monetary criteria, recommendations, and developing the design.

South Water Reclamation Plant* | Albuquerque Bernalillo County Water Authority

Albuquerque, New Mexico

Electrical lead engineer for electrical medium voltage loop A&B design project. Reconfigured the existing two medium voltage loops throughout the facility to improve safety, reliability, and ease of maintenance by eliminating taps to connect downstream transformers. The two medium voltage loops are connected to existing 15-kV metal enclosed load interrupter switchgears (main-tier-main) via new 15-kV pad mount switchgears (S&C PME style) at various points throughout the facility. The downstream transformers are reconnected to be fed from individual fused switches by retrofitting the existing 15-kV metal enclosed load interrupter switchgears. All the medium voltage switches are configured with kirk keys to prevent from both loops being paralleled. Demolition of a 50-year-old existing outdoor 15-kV service entrance switchgear and replacing with a 15-kV arc resistant service entrance switchgear in a new building along with providing medium voltage breaker controls, coordinating interconnection with the power utility for parallel operation and provide recommended relay settings in accordance with IEEE 1547. The design also included describing detailed construction sequence to minimize the

EDUCATION

- ▶ MS, Electrical Engineering (Industrial Electrical & Control Systems)
- ▶ Bachelor of Technology, Electrical and Electronics Engineering

REGISTRATIONS

- ▶ Professional Engineer (CO, TX)

2 YEARS WITH BURNS & MCDONNELL

6 YEARS OF EXPERIENCE

VAMSI PATWARI, PE

(continued)

outages through the facility while transferring the power to the new configuration.

Dodd WTP Hydroelectric Project | Left Hand Water District

Niwot, Colorado

Electrical engineer. Vamsi worked on a construction phase for a new Hydroelectric Facility. Reviewed shop drawings and design for the construction phase of this project. The overall scope of work included detailed design of a 200 kW micro-turbine at the 10 MGD Dodd Water Treatment Plant. The Dodd WTP receives raw water from Northern Colorado Water Conservation District's Boulder Feeder Canal as well as the new SWSPH. The Dodd micro turbine will take an average of 9 cubic feet per second (cfs) of raw water from SWSPH at a pressure range between 85 and 195 psi. The financial analysis provided by BMCD indicates a viable payback for the micro turbine project. An alternative delivery model was selected to reduce the overall project schedule by pre-purchasing long lead time equipment at 30% design.

Zenon PLC Upgrades at Wes Brown WTP | City of Thornton

Thornton, Colorado

Electrical engineer that provided engineering support for the replacement of one of the City's major PLC systems. This project is a conversion of the Zenon PLC at the Wes Brown Water Treatment Plant, including migration of software packages. Developed a design package for the PLC conversion, and coordinated between Suez, system integrator and City. Burns & McDonnell developed record documents after installation and startup of the upgraded PLC was completed

Vac Pump Improvements at Wes Brown WTP | City of Thornton

Thornton, Colorado

Electrical engineer for the addition of vacuum pumps to serve the membranes in the Wes Brown Water Treatment Plant. Two 15 horsepower vacuum pumps will be installed to maintain water surface levels in the air/water separation vessels and maintain prime on the membrane permeate pumps. Vacuum pumps will be provided with integral variable frequency drives and controls.

West Gravel Lakes Pump Station Electrical Upgrade* | City of Thornton

Thornton, Colorado

Electrical engineer for the replacement of the electrical distribution equipment at the West Gravel Lakes pump station. The existing electrical equipment (indoor and outdoor MCC, disconnect switch and ATS, HP-3 panelboard in KMNO4 building) was identified to be replaced based on the previous arc flash study analysis report. Along with replacing this equipment, the design focused on simplifying the distribution scheme by adding a service entrance switchboard (SWBD-WGL). This also helped in reducing the arc flash energy levels at the MCCs. The design also focused on cost effective solutions in reconnecting HP-1 (Panelboard in PAC building) and HP-3 (Panelboard in KMNO4 building) to generator backup source (MCC-WGL-B).

Zone 3/4 Pump Station MCC and VFD Upgrades | City of Thornton

Thornton, Colorado

Project manager and electrical engineer that developed the design and specifications for the replacement of two motor control center (MCC) switchboards and the installation of two new variable frequency drives (VFDs) at two existing pumps in the Zone 3/4 Pump Station. The MCCs to be replaced include the existing north Square D MCC and the existing south Cutler Hammer MCC. New VFDs will be installed on pumps 3-2 and 3-3 at the pump station, which do not currently have VFDs.

*Denotes experience prior to joining Burns & McDonnell



RAEGAN SWARTZ

Process



Raegan is an assistant environmental engineer in our Denver office. Her primary responsibilities include hydraulic modeling, system design, and construction support. Her work has included projects ranging from wastewater plant construction support, to lift station rehabilitations to reclaimed water system best practices.

Modeling and design-software skills include CAD, Civil 3D, ArcGIS, and WaterGEMS. System design experience includes equipment sizing,

materials selection, and facility layout. Her roles on projects outside of design includes coordinating permits with governing agencies and coordinating project team members across disciplines to deliver quality work on schedule.

EDUCATION

- ▶ MBA
- ▶ BS, Environmental Engineering

1 YEAR WITH BURNS & MCDONNELL

1 YEAR OF EXPERIENCE

Green River WWTP | Green River Wyoming

Green River, Wyoming

Project engineer. Assisted with bid phase documents and responses to bidder's questions.

Brighton Phosphorus Removal | City of Brighton, Colorado

Brighton, Colorado

Project engineer. Raegan assisted with the design of a chemical feed system for phosphorus removal. Work for this project included a site application amendment filed with the State, a design report, and a set of drawings and specs for the construction of the system.

Chambers Pump Station Expansion | Arapahoe County Water and Wastewater Authority

Centennial, Colorado

Process. Performed quality review of the electrical and design of the control philosophy of a pump station to pressurize an irrigation header with multiple different HP pumps allowing for a wide range of control for large scale commercial customers. As project engineer, assisted with the pump selection and design for a unique lift station running six pumps of various sizes to allow for continuous water delivery over a wide range of demands. Coordinated design document transition, responded to bidder questions through the bid phase, and assisted with submittal reviews in the construction phase.

Broomfield Interlocken Lift Station Renovation | City and County of Broomfield, Colorado

Broomfield, Colorado

Project engineer. Assisted with the site application and lift station permitting process with the Colorado Department of Public Health and Environment (CDPHE). Worked closely with the client to determine which parts of the lift station could be rehabilitated and how to design a new system within the confines of the existing infrastructure. Coordinated document transition from the project's design phase to bid phase.

On-Call Engineering Services | Dominion Water & Sanitation District

Greenwood Village, Colorado

Project engineer. Used the water modeling program WaterGEM to help the client understand their system pressures and appropriate pipe sizes for their distribution system.

RAEGAN SWARTZ

(continued)

Broomfield Reuse Water Quality | City and County of Broomfield, Colorado

Broomfield, Colorado

Process. The purpose of the project is to provide engineering solutions and budgets to improve the water quality in the City-wide reuse irrigation system. The City operates a 12 MGD reuse system for irrigating parks and open space. The reuse water comes from treated wastewater effluent and raw water stored at a reuse reservoir. The distribution system includes pumping systems at the wastewater plant and at the reuse reservoir, tanks, and multiple pressure zones. The purpose of the study is to provide recommendations for improving water quality of the reuse water. The City has experienced maintenance problems due to organic and inorganic debris in the reuse water and some issues with plantings. Burns & McDonnell reviewed the chemical and physical make-up of the reuse water, visited the treatment/screening locations, irrigation sites, and maintenance issues found with the system. From this information, we provided a list of recommendations for improving the water quality of the reuse system. As Project Engineer, Raegan assisted with the initial observation of the system and helped to formulate a list of improvements for the City. Project work included a final report summarizing the reuse system, the problems observed by various stakeholders and costs associated with suggested improvements.



NICK TESSITORE, PE, LEED AP BD+C, ENV SP

Civil Engineer



With almost two decades of civil engineering experience, Nick specializes in site development, pavement design, drainage and stormwater design, project management, master planning, and construction inspection. He excels in preparing development site plans, utility routing, drainage development,

and working with municipalities for zoning development and all permitting.

TDS Compliance Project at Cherokee WRF | Cherokee Metropolitan District

Colorado Springs, Colorado

Lead civil engineer. The Cherokee WRF discharges to an alluvial aquifer. The discharge permit includes a total dissolved solids (TDS) limit of 400 mg/L, which cannot be met without a TDS reduction process step. The project team converted the existing 4.8 MGD sequencing batch reactor secondary process into a membrane bio-reactor followed by reverse osmosis to reduce TDS. The project also includes a new headworks for fine screening ahead of the MBR process.

Wastewater Treatment Plant | Boxelder Sanitation District

Fort Collins, Colorado

Lead civil engineer for design and construction services for the new 3-MGD mechanical wastewater treatment plant. This project utilized the design/contract-build contracting method to select a general contractor to participate in a collaborative project delivery environment. Design activities required full site development including yard piping, electric, natural gas, fiber optic communications, site access, and storm water mitigation. Design also included grading, drainage, pavement design, soil evaluation, erosion control measures, yard piping, utility coordination, survey, and foundation placement.

Stonegate Wastewater Facility Upgrades | Stonegate Village Metropolitan District

Parker, Colorado

Project civil engineer for the design of the upgrades to the wastewater treatment plant. The project provided upgrades to handle a 6.5 MGD capacity, so the facility can reliably meet the current permit limits and reduce overall operations and maintenance requirements by improving treatment processes. The design consisted of new access roads, fencing, grading, drainage, soil evaluation, permitting, erosion control measures, and site mobility. Other design activities include earthwork, utility coordination, survey, building and foundation placement, and drainage design.

Plum Creek Water Reclamation Facility Expansion | Plum Creek Water Reclamation Authority

Castle Rock, Colorado

Civil engineer for the capacity expansion of the Plum Creek WWTP from 6.4 to 9.5 MGD. The primary purpose of the project is the capacity expansion and replacement of the solids stabilization system with an ATAD process to create Class A biosolids. The process includes the reactor tanks, aerated and large bubble mixed WAS tank, thickening processes, and transfer pumping systems. The project also included replacing the existing headworks/grit and UV disinfection systems, adding a 12 MGD (peak) continuous up-flow sand filter to meet the 0.05 mg/L phosphorous effluent limit, and addition of odor control.

EDUCATION

- ▶ BS, Civil Engineering

REGISTRATIONS

- ▶ Professional Engineer (CO, KY, WY, UT, NM, KS, NV, OR, WA, MT, OK, PA, AL, TX, AZ, MO)
- ▶ LEED AP BD+C
- ▶ ENV SP

13 YEARS WITH BURNS & MCDONNELL

19 YEARS OF EXPERIENCE

NICK TESSITORE, PE, LEED AP BD+C, ENV SP

(continued)

Williams-Monaco Wastewater Treatment Plant BNR Upgrades | South Adams County Water and Sanitation District

Commerce City, Colorado

Lead civil engineer for the design of the upgrades to the wastewater treatment plant. The project made improvements to the WWTP in order to meet CDPHE's nutrient removal effluent limits. Capacity changes were not included in this upgrade as the plant has a current rating of 8 MGD. The existing MBBR system was converted to an integrated fixed-film activated sludge (IFAS) process for biological phosphorus removal and nitrification/de-nitrification. Also, a second IFAS treatment train was constructed to provide the required secondary treatment capacity and redundancy. The design consisted of new access roads, grading, drainage, soil evaluation, permitting, erosion control measures, and site mobility. Other design activities include earthwork, utility coordination, survey, building and foundation placement, and drainage design.

North Water Reclamation Facility Capacity Improvements | Town of Erie

Erie, Colorado

Lead Civil Engineer for the improvements to the NWRP plant to include a solids load out system truck containment, a new sulfuric acid tank building, and expansion of the splitter box. Overall design consisted of pavement, grading, drainage, soil evaluation, permitting, erosion control measures, and site mobility. Other design activities include earthwork, utility coordination, building and foundation placement, and storm drainage.

Wastewater Treatment Facility Expansion | Green River

Green River, Wyoming

Lead civil engineer. Nick worked on the design and construction services of a new 1.1 MGD wastewater treatment plant. The plant was sited near the existing lagoons and treatment works. Demolition and phasing of the existing buildings is required for the new facility. The design consists of demolition, site work, grading, erosion control, pavement design, utility design, storm drainage design, fencing, erosion control measures, and offsite stormwater analyses. Traffic routing and truck delivery/loading were also completed for the site design. Other activities included utility coordination, survey, and geotechnical evaluation.

Dodd Water Treatment Plant Upgrade | Left Hand Water District

Niwot, Colorado

Lead civil engineer for the design and construction of the upgrades to the water treatment plant. The project provided upgrades to increase the WTP to a 10 MGD capacity, so the facility can reduce overall operations and maintenance requirements by improving treatment processes. The design consisted of access roads, fencing, grading, drainage, soil evaluation, permitting, erosion control measures, and site mobility. Major earthwork design involved raising and expanding the existing backwash ponds to an elevation above the current groundwater table and installing a geosynthetic clay liner. Other design activities include earthwork, utility coordination, survey, building and foundation placement, and drainage design.

Plum Creek Water Advanced Treatment Project | Town of Castle Rock

Castle Rock, Colorado

Lead civil engineer for the design and construction services for the addition of advanced treatment processes to the existing Plum Creek Water Purification Facility (PCWPF). Design activities required full site development including raw water piping, finished water, electric, natural gas, fiber optic communications, site access, and storm water mitigation. Other design consisted of grading, drainage, pavement design, soil evaluation, erosion control measures, yard piping, utility coordination, survey, and foundation placement.



DAVID OLSEN, PE

Mechanical Engineer



David is a mechanical engineer with 20 years of experience designing HVAC and plumbing systems for a variety of building types. He has recent water treatment plant experience and is currently working on projects for the Town of Castle Rock, City of Thornton and City & County of Broomfield.

EDUCATION

- ▶ BS, Mechanical Engineering

REGISTRATIONS

- ▶ Professional Engineer (CO, WY, MT, SD)

3 YEARS WITH BURNS & MCDONNELL

20 YEARS OF EXPERIENCE

TDS Compliance Project | Cherokee Metropolitan District

Colorado Springs, Colorado

Mechanical engineer. The Cherokee WRF discharges to an alluvial aquifer. The discharge permit includes a total dissolved solids (TDS) limit of 400 mg/L, which cannot be met without a TDS reduction process step. The project team converted the existing 4.8 MGD sequencing batch reactor secondary process into a membrane bio-reactor followed by reverse osmosis to reduce TDS. The project also includes a new headworks for fine screening ahead of the MBR process. Designed HVAC and plumbing for 3 new buildings. This project required emergency shower/eye wash for a site that did not have adequate water (both quantity and quality), was able to come up solutions. This project has required multiple redesigns and complex coordination's with a tight timeframe to meet state mandates.

Boxelder Wastewater Treatment Facility Expansion | Boxelder Sanitation District

Fort Collins, Colorado

Mechanical engineer. Responsible for the equipment selection, system evaluation and design review. The Green River Wastewater Treatment Plant is a \$33M design-build project. The facilities include different types of rooms, buildings and equipment to meet the requirements of these rooms, including a Class 1 Div 1 space. The mechanical design included integration and controls for multiple RTU's and exhaust fans to meet the heating, cooling and ventilation of the various rooms.

Ft Lupton WWTP Upgrades | City of Fort Lupton

Fort Lupton, Colorado

Mechanical engineer. This project includes permitting, design, procurement, and construction services for the retrofit and expansion of the Ft. Lupton WWTP, expanding its treatment capacity to 3.1 MGD. This project adds a second process train, new headworks, new disinfection system, and renovation of the solids stabilization and dewatering systems to the WWTP. Coordinated and design the mechanical and plumbing for the 3 remodeled buildings and 2 new buildings.

Wastewater Treatment Facility Expansion | City of Green River

Green River, Wyoming

Mechanical engineer. Responsible for the equipment selection, system evaluation and design review. The Green River Wastewater Treatment Plant is a \$30M design-build project. The facilities include different types of rooms, buildings and equipment to meet the requirements of these rooms, including a Class 1 Div 1 space. The mechanical design included integration and controls for multiple RTU's and exhaust fans to meet the heating, cooling and ventilation of the various rooms.

DAVID OLSEN, PE

(continued)

Maple Grove Water Treatment Solids Handling | The Consolidated Mutual Water Company

Lakewood, Colorado

Mechanical engineer. Responsible for design of the HVAC and plumbing for a new solids handling building for the existing water treatment plant. This included doing building loads, equipment loads and calculating ventilation requirements. Then designing a system to meet these requirements. The plumbing included multiple hot water systems to meet the requirements of the process needs and emergency showers.

Plum Creek WPF Advanced Treatment Project | Town of Castle Rock

Castle Rock, Colorado

Mechanical engineer. Responsible for designing the HVAC and plumbing for a new advanced treatment building at the Plum Creek Water Purification Facility. This included doing building loads, equipment loads and calculating ventilation requirements. Then designing a system to meet these requirements. The plumbing included multiple hot water systems to meet the requirements of the process needs, emergency showers and lab requirements.

Pierre Wastewater Treatment Plant Upgrades | City of Pierre

Pierre, South Dakota

Mechanical engineer. Design and redesign the HVAC and plumbing for 6 buildings with use and equipment changes.

Lynn R. Morgan Water Treatment Plant Expansion | Town of Erie

Erie, Colorado

Mechanical engineer. Designed and construction administration for the mechanical and plumbing for the expansion of this facility from 9.9 to 16 MGD.

Broomfield Water Treatment Plant Expansion | City and County of Broomfield

Broomfield, Colorado

Mechanical engineer. Responsible for designing the HVAC and plumbing for a new chemical building and remodel of existing water treatment plant including office and lab space at the Broomfield Water Treatment Plant. This included doing building loads, equipment loads and calculating ventilation requirements. Then designing a system to meet these requirements. The plumbing included multiple hot water systems to meet the requirements of the process needs, emergency showers and lab requirements.

Thornton Water Treatment Plant Replacement Project | City of Thornton

Thornton, Colorado

Mechanical engineer. Design and construction services for a new 20 MGD water treatment plant that includes advanced treatment technologies for taste and odor removal. The facilities include many different types of rooms and equipment to meet the requirements of these rooms. The mechanical design included integration and controls for multiple RTU's and exhaust fans to meet the heating, cooling and ventilation of the various rooms.





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