November 1, 2023

North Dakota Industrial Commission
State Capitol – Fourteenth Floor
600 East Boulevard Avenue
Bismarck, ND 58505

Re: Project titled "Unlocking the Full Potential of Produced Water as a Key Component of Clean Sustainable Energy"

To NDIC & Clean Sustainable Energy Authority Program:

Triple 8 LLC dba Wellspring Hydro (WH) is submitting this application for grant and loan funds under the North Dakota Industrial Commission Clean Sustainable Energy Authority Program. The Wellspring Hydro project will be operational by the end of 2025. The project's commercialization is a result of previous CSEA support for FEL-3 engineering, field validation progress and initial detailed design (completion of FEL-3.1 and FEL 3.2).

Wellspring Hydro will utilize a unique feedstock from oilfield brines (a.k.a. produced water) that presently is treated and pumped into disposal wells. Wellspring Hydro's project will produce three commercially essential products (and lithium extraction) in a sustainable format that will diversify North Dakota's economy, bolster existing industries with an improved cost position, and drive clean sustainable energy.

Wellspring Hydro, a North Dakota company, is prepared to execute a strategy to build a $324 million dollar treatment facility. When completed this business will:

1. create 53 new full-time jobs and 200+ local contractors to build.
2. generate new local products and tax revenues for North Dakota.
3. enhance North Dakota's economic diversity, sustainable energy, and environmental outlook.
4. create feedstocks from other valuable materials in the future, including lithium.

We are requesting $5,000,000 in grant funds and $25,000,000 in loan funds from the Clean Sustainable Energy Authority Program of the North Dakota Industrial Commission. In return, Triple 8 LLC commits to matching the funds and remaining capital with equity investment.

If you have any questions or require additional information, please do not hesitate to contact Mark Watson 281-813-6735 or mark@wellspringhydro.com.

Mark Watson
CEO
Wellspring Hydro

APPLICATION CHECKLIST

Use this checklist as a tool to ensure that you have all of the components of the application package. Please note, this checklist is for your use only and does not need to be included in the package.

☒	Application
☒	Transmittal Letter (Included in Application)
☒	Tax Liability Statement (Appendix)
☒	Letters of Support (Appendix)
☒	Confidentiality Request (Attached)
☒	Business Plan (Attached)
☒	Historical Financial Statements (3 years Included in Business Plan)
☒	Budgeted Projections (Included in Business Plan)
☒	Loan/Loan Guarantee Application (Attached)
☐	Other Appendices (If Applicable)

When the package is completed, send an electronic version to sustainableenergy@nd.gov and 2 hard copies by mail to:

Clean Sustainable Energy Authority
North Dakota Industrial Commission
State Capitol – 14th Floor
600 East Boulevard Ave Dept 405
Bismarck, ND 58505-0840

For more information on the application process please visit:
http://www.nd.gov/ndic/csea-infopage.htm

Questions can be addressed to Al Anderson (701) 595-9668.

Clean Sustainable Energy Authority

North Dakota Industrial Commission

Application

Project Title: Unlocking the Full Potential of Produced Water as a Key Component of Clean Sustainable Energy

Applicant: Mark Watson

Date of Application: Nov 1, 2023

Amount of Request
Grant: $5,000,000 USD
Loan: $25,000,000 USD

Total Amount of Proposed Project:
$324,730,000 USD

Duration of Project: 26 Months

Point of Contact (POC): Mark Watson

POC Telephone: (281) 813-6735

POC Email: mark@wellspringhydro.com

POC Address: 4828 Highway 85 Williston, ND 58801

TABLE OF CONTENTS

Please use this table to fill in the correct corresponding page number.

ABSTRACT

Background:

Wellspring Hydro is a locally founded North Dakota company with a mission to unlock the full potential of produced water as a feedstock for sustainable, clean energy. Wellspring Hydro is requesting financial support for commercialization of an innovative solution that will diversify the state's economy through an environmental solution. The Wellspring Hydro process is based on combining proven technologies in a novel way to develop products from various renewable components, including produced water waste stream as the key feedstock.

Wellspring Hydro's project will produce commercially essential commodity products in the State of North Dakota in a sustainable format that will diversify the economy, bolster existing industries (clean sustainable energy), and operate with a vision of zero waste or harmful emissions.

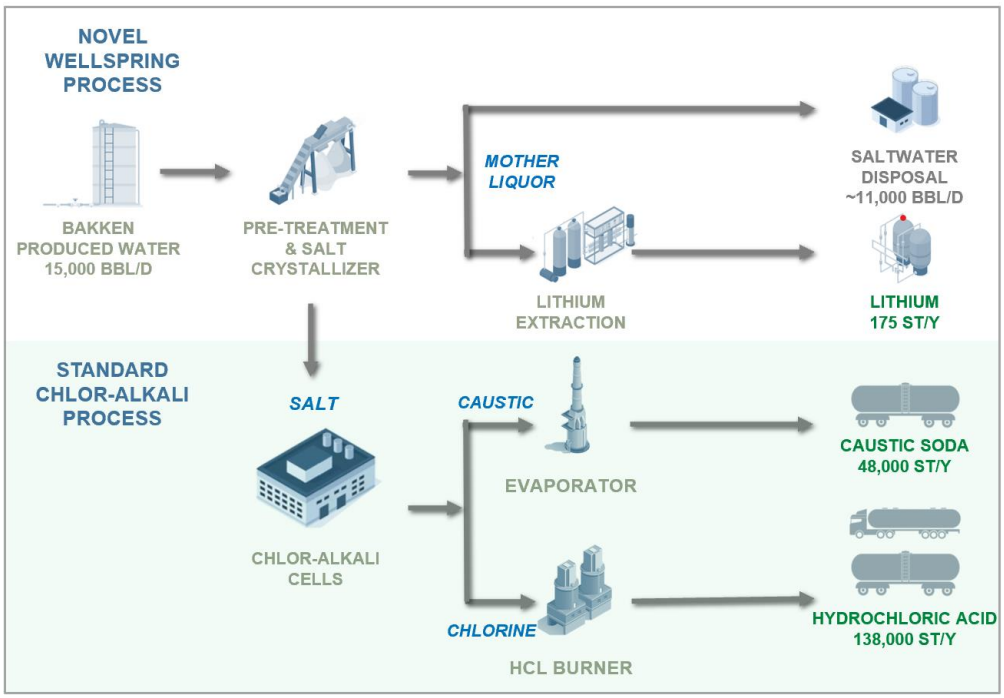
Wellspring Hydro was awarded a $5 M grant from the Clean Sustainable Energy Authority (CSEA) in August 2023 focused on Field Validation and Initial Detailed Design. This scope has already yielded great progress in the refined FEL-3.1 and FEL-3.2 engineering work as initial detailed design. Additionally, significant progress has been made on selecting a location and produced water partner. Wellspring Hydro has selected the Marley Crossing area of SW Willams County for the location of the facility. This location offers strategic and synergistic benefits of water, rail, power and infrastructure.

Based on recent escalation and inflation, Wellspring Hydro received a $350+ M FEL-3 estimate after having multiple estimates around $250 M previously. The CSEA funds from August have been utilized to initiate an FEL-3.1 and FEL-3.2 to complete additional design and cost estimates to fine tune the outlook. Fortunately, the Chlor-Alkali market has seen additional increases in pricing, which has supported the updated financial outlook. These challenges are always anticipated in a large-scale project, and Wellspring has been able to update the strategy to support a strategy approve for commercialization. In addition, Wellspring has been able to progress terms with a private equity investor, produced water partner and offtake agreements to solidify the status. If Wellspring Hydro has the opportunity to present to the CSEA committee following this application, there should be additional commercial progress to share.

Previously, Wellspring Hydro was awarded a $1 M grant from the Clean Sustainable Energy Authority (CSEA) in December 2021 focused on the execution of the FEL-3 engineering and design study to position for commercialization. The FEL 3 engineering study (led by Hargrove Engineers and Constructors) was completed in May 2023. The purpose of the FEL 3 study was to provide a +/- 10% estimate for a 150 ton per day chlor-alkali plant to be located outside of Williston, ND.

Wellspring Hydro's cost to build and install a new greenfield 150 STPD membrane plant in Williston, North Dakota, is $324 million. With an IRR of 21%- and 5-year payback, this project on its own merits is a crucial investment for the state of North Dakota, aligned with the intent of the Clean Sustainable Energy Authority's mission.

A high-level process flow from produced brine to product creation can be seen in the following diagram:



There is a more detailed overview of the Wellspring Hydro process diagram in the Methodology section, in addition to the methodology of the objectives for funds requested.

Objectives:

Finalize, execute, and deliver.

	Key Deliverables	Funds	Results
1	**Detailed Design Engineering**	$10.0 M ($5.0 M) CSEA	The critical objective is to continue detailed engineering in parallel to early construction in preparation for equipment installation and process start-up.
3	**Procurement of Specialized Equipment & Civil Construction**	$50.0 M ($25.0 M) CSEA	The critical objective is to secure specialized and long-lead item equipment to meet overall timeline. The objective will require early funds to complete “Issue for Purchase” (IFP) technical packages with vendors and make initial downpayments on equipment.
5	**Construction, Equipment & Plant Start-up**	$254.8 M	The critical objective is to execute engineering plans of all construction activities required from onsite mobilization through construction completion and pre-commissioning for a seamless implementation of the full-scale facility.

Indicates Grant Funds

Indicates Loan Funds

Expected Results:

The primary result is to complete the construction and start-up of the Wellspring Hydro Chlor-alkali facility by Q4 2025.

Key Deliverables	Results
Production of High Value Commodity Products	Wellspring Hydro's project will produce commercially essential commodity products Caustic Soda and Hydrochloric Acid. Both products have current demand in industrial and energy sectors and future demand in the support of clean sustainable energy (Carbon Capture, Oil & Gas production, and lithium extraction).
Lithium Extraction	As a component of the field trial process and Initial Detailed Design, Wellspring Hydro will be able to develop the lithium extraction process of the "mother liquor" stream. There are multiple technology providers that have completed initial feasibility and will progress to Equipment proposals. Based on the new MOU partnership, Wellspring Hydro is set to produce 175 ST per Year of Lithium upon plant start-up.
Sustainable Use of Produced Water Waste	40+% reduction in produced water that enters the plant will be realized, along with the creation of all process fresh water needs from the treated condensate stream off the crystallizer. Value is created from what is currently wasted.
Financial Impact	The business is projected to have a year one of $86.4 M revenue and support fifty-three full-time employees. The current unleveraged financial returns yield a 21.3% IRR and $126.36 M NPV. Year 1 EBIDTA is expected to be $56.3 M with steady performance within +/- 5% consistency through year 5 EBIDTA at $58.8 M. The full-rate state tax on product sales is expected to be ~$5.5 M per year.

Duration:

The detailed design, construction and start-up is expected to take 24-26 months after the Financial Investment Decision, planned for September 2023.

Critical Milestones

Milestone	Milestone Date
FEL-3/DD Kick-off Meeting	15 Feb 23
FEL-3 Complete	15 Jun 23
Field Validation – Technology and Commercial	01 Nov 23
Financial Investment Decision (FID)	01 Jan 24
Procurement of Specialized Equipment	01 Mar 24
Detailed Design Engineering Start	01 Apr 24
Construction & Civil Mobilization	04 Jul 24
Detail Design Complete	20 Feb 25
All Major Equipment	03 Jul 25
Mechanical Completion	05 Oct 25
Start-Up & Commissioning	01 Jan 26

Wellspring Hydro guided by Hargrove Engineers and Construction partners believes that a 24-26 month execution timeline is achievable. In the Business Plan, there are additional details around contingencies of the schedule. There are several overlapping activities that provide flexibility in the schedule but ultimately a few key milestones that are highlighted in the request for CSEA funding. These key milestones to ensure schedule are:

- Procurement of specialized equipment
- Construction mobilization (civil)
- Hiring and training of operations personnel

Detailed Design – 12 Month Timeline

- The full scope of work identified in the appendix Hargrove Detailed Design Proposal – Wellspring Hydro, is expected to take 12 months. As this work is critical to installation and start-up, there will be ongoing activities with procurement and base construction.

Procurement of Specialized Equipment & Civil Construction – 9 Month Timeline

- The scope of procurement of specialized equipment and civil construction are immediate activities in 2024 to meet the overall execution timeline. The plan is to begin the procurement process in Q1 2024 and begin civil construction in Q2 2024 dependent on the weather.

Total Project Cost:

Capital Estimates	Cost in USD
Technical and Commercial Viability	$4,000,000.00
Front-End Engineering & Design	$6,000,000.00
Civil Construction	$20,936,939.00
Concrete Construction	$26,892,797.00
Structural & Steel	$5,547,290.00
Architectural & Buildings	$33,159,224.00
Mechanical Equipment	$18,364,784.00
Piping	$35,329,583.00
Electrical & Instrumentation	$11,095,365.00
Process & E/I Equipment - SWD	$8,000,000.00
Process & E/I Equipment - Front-End	$20,000,000.00
Process & E/I Equipment - Chlor-Alkali	$51,103,296.00
Detailed Engineering	$10,000,000.00
General Conditions & Indirect	$41,921,038.00
Contractor Fee's & Mark-ups	$10,945,210.00
Contingency & Escalation	$21,467,474.00
Total	**$324,763,000.00**

Indicates Grant Funds

Indicates Loan Funds

Participants: Identified partners for execution of Grant and Loan request. Additional partner information is available in the Business Plan, and specific technology partners are outlined in resources.

- Wellspring Hydro – Management Team - Williston, ND
- Hargrove Engineers & Constructors – Birmingham, AL
- Tormod Operators – Birmingham, AL
- Mastec Infrastructure - Coral Gables, FL
- FCI Constructors – Denver, CO
- InDemand – Bismarck, ND
- Produced Water Partner(s)
- Salt Crystallizer Partner(s)
- Lithium Extraction Partner(s)

PROJECT DESCRIPTION

Objectives:

Wellspring Hydro (WSH) intends to build a modern chlor-alkali plant in Williston, North Dakota which will use crystallized sodium chloride salt deriving from the Williston Basin oilfield brine (i.e., produced water); creating high quality sodium chloride salt and water from an oilfield waste stream to feed a chlor-alkali process will be a first of its kind.

Wellspring Hydro's cost to build and install a new greenfield 150 STPD membrane plant in Williston, North Dakota, is $324 million.

Finalize, execute, and deliver.

1. Detailed Engineering Plan
    a. Following Initial Detailed Design phase and in parallel of the procurement plan, Hargrove will continue to provide engineering services as required by the construction work to clarify or revise the engineering documents provided for the construction of the project. Hargrove will provide information requested to assist the contractors in the construction of the project and the coordination of their activities, including 3-D Model review assistance at the site.
    b. Detailed discipline engineering will continue for 10 months post FEED Phase and to achieve the engineering construction release dates.
    c. The detailed objectives and deliverables for Detailed Design are outlined in the Appendix – Hargrove Detailed Design Proposal – Wellspring Hydro. The Detailed Design areas of scope include Civil, Structural, Architectural, Process, Mechanical, Building Mechanical, Piping, Electrical, Instrumentation. Controls & Automation and Procurement.
2. Procurement Long-lead Equipment & Civil Construction
    a. Hargrove and Associates Purchasing Department will provide procurement support services for the Project. Hargrove will be responsible for the procurement of all major equipment, minor equipment, tagged instruments, fabricated materials.
    b. As a part of FEL-3 process, Wellspring Hydro and Hargrove have identified a bidder list, completed technical packages an Engineering Requisition Worksheet (ERW) for engineered equipment and issued Requests for Quotation (RFQ). The bids have been received and analyzed for technical and commercial consideration. These costs are utilized in the final cost estimate for FEL-3.
    c. The critical objective is to award specialized and long-lead item equipment to meet overall timeline. The objective will require early funds to complete "Issue for Purchase" (IFP) technical packages with vendors and make initial downpayments on equipment. Additionally, funds will be utilized to achieve the timeline with a focus on civil construction in 2024 to achieve weather constraints.
3. Construction & Plant Start-up
    a. Wellspring Hydro will work with Hargrove (Engineering and Design) and Mastec (Construction Management) to formulate the contract documents for the construction

contracts per the project contracting strategy. Hargrove will assist by providing technical and construction management support during the duration of project through mechanical completion.

b. Wellspring Hydro will formulate the Project Completion Plan and will assist with planning QA/QC functions to assure incremental acceptance of the plant and coordination with the start-up team. Wellspring Hydro will utilize Mastec to fulfill its construction obligations. Wellspring Hydro will manage all construction activities required to complete the work to the point of being ready for commissioning.

c. The critical objective is to execute engineering plans of all construction activities required from onsite mobilization through construction completion and pre-commissioning for a seamless implementation of the full-scale facility.

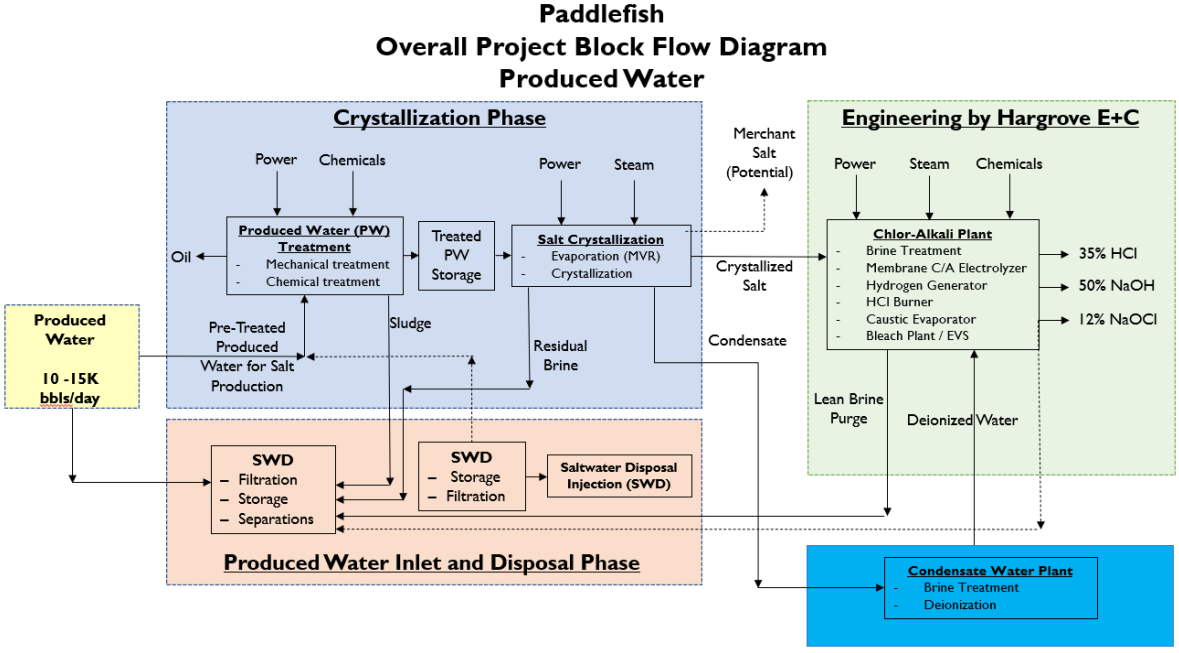
Methodology:

At the core of a Chlor-alkali facility is salt. Conveniently, at the core of the Williston Basin is salt. On average the Williston Basin oilfield operators dispose of up to 1,500,000 barrels of produced water brine per day, laden with salt and other valuable minerals. Conservative estimates place the salt tonnage beyond 30,000 tons per day of disposed salt contained in the water. Wellspring Hydro will utilize 0.01% of this highly valuable in-basin salt to supply the critical input needed to make commodity materials which will be the output and profit center for Wellspring Hydro.

While oil and gas operators work aim to keep the salt in the produced water to avoid surface issues, Wellspring Hydro has done numerous tests (5) to prove that the salt can be removed in a consistent cost-effective manner.

The high-level block flow diagram begins to show the Wellspring Hydro Process taking shape as many existing and currently successfully deployed technologies are brought together to leverage the full value of North Dakota's unique assets.

A high-level process flow from produced brine to product creation can be seen in the following diagram:



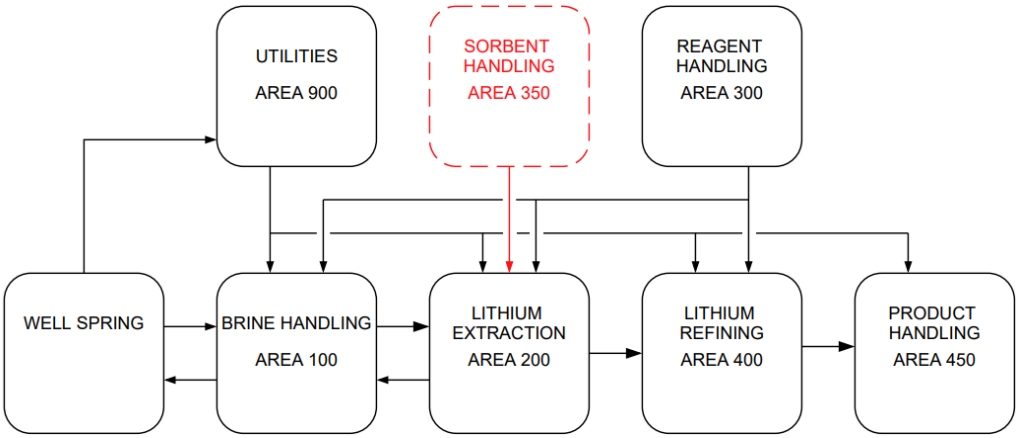
Salt Crystallization process creates 300 tons of high-quality salt per day, the system will include evaporators, preheaters, separating vessels, MVRs (mechanical vapor recompression units), recirculation pumps, instrumentation, valving, ducting, piping, and a control panel system.

Modern Chlor-Alkali technology includes sophisticated membrane cells to split apart the NaCl molecule via electrochemical reactions. The salt and water streams fed to the membrane cells must be highly purified to operate efficiently. Hargrove Engineering has designed and managed multiple chlor-alkali plant projects and will coordinate the overall project design for the entire Wellspring Hydro facility. There are currently 52 active Chlor-Alkali facilities in the US, utilizing this membrane technology.

Lithium Extraction:

In addition to valuable high quality sodium chloride salt (NaCl), North Dakotas oilfield produced water brine contains a multitude of value-added elements. These elements are value-added for research and development opportunities for North Dakota, industry partners and our investors. One element Wellspring Hydro has confirmed in the raw brine in attractive quantities is the valuable metal, Lithium.

Upon the removal of valuable NaCl (sodium chloride), and condensate from the oilfield produced water brine, it will be concentrated into an effluent stream referred to as “Mother Liquor.” This concentrated stream will contain a higher amount of lithium (2-3x) than what entered the Wellsrping hydro process, which we have confirmed though numerous to be around 50ppm on the low-end average. Given the concentration in the raw brine, testing has shown that nearly 175 tons per year can be produced in the facility. This Li will be targeted for DLE (direct lithium extraction) with a strategic technology partner who has developed proprietary technology specifically built for the removal of lower concentration higher volume Lithium brines such as the Wellspring Hydro effluent.



To define the methodology of the objectives;

1. Detailed Engineering Plan
    a. As the project progresses, Detailed Engineering will be an ongoing effort to support the installation and completion of the process. The system engineer will continue to "own" the P&ID and is responsible for the specification of all equipment, and coordination of all supporting discipline tasks necessary for the complete definition and documentation of the system. The system engineer is also responsible for the expenditure of resources (engineering manhours, budgeted dollars for materials, etc.) associated with those systems under his or her control.
    b. The methodology of the Detailed Design will include:
        i. Development of equipment specifications will be in parallel in certain cases with approval of P&ID's and will commence upon client approval of all P&ID's.
        ii. Detailed discipline engineering continues for 10 months post FEED Phase and to achieve the engineering construction release dates procurement PO dates as listed in the estimate basis will need to be committed during this phase of the project.
2. Procurement of Specialized Equipment & Civil Construction
    a. Hargrove will provide procurement assistance services for Wellspring Hydro. Each chlor-alkali unit operation is based on proven technology supplied by experienced and respected technology suppliers.
    b. The key methodology steps include:
        i. Upon receipt of a Wellspring Hydro approved Award Recommendation, Hargrove will enter the proposed purchase order and issue purchase order.
        ii. The Engineers will be responsible for revising the RFQ technical package to an "Issue for Purchase" (IFP) technical package. This represents the final agreed upon purchase specifications and will be made a part of the purchase order.
        iii. Purchase orders will require additional engineering support from vendors and require downpayments on equipment to expedite delivery schedule.
        iv. Hargrove will expedite receipt of the vendor data from the supplier based on the Vendor Data Requirements established by the originating Engineer.
        v. The Engineers will review and approve all vendor data for the items they originate regarding compliance with the requirements of the design.
        vi. Hargrove will expedite delivery of the equipment and materials.
3. Construction & Plant Start-up
    a. Wellspring Hydro and Hargrove will formulate the contract documents for the construction contracts per the project contracting strategy. Wellspring Hydro will administer these contracts as construction manager by providing technical and construction management support during the duration of project through mechanical completion.
    b. The basic methodology steps to execution will be in five basic phases:
        i. "Enabling civil work"—piling, underground piping & electrical.
        ii. "Get out of the ground:" Foundations, slabs, development.
        iii. "Install the equipment:" Steel erection, equipment erection.
        iv. "Bulk installation:" Piping, electrical and instrument work.
        v. "Project completion:" Testing, checkout, turnover by system.

Anticipated Results:

Lithium Extraction

As a component of the field trail process and Front-End Engineering & Design, Wellspring Hydro will be able to develop the lithium extraction process of the "mother liquor" stream. There are multiple technology providers that have completed initial feasibility and will progress to Equipment proposals. After Wellspring Hydro recovers salt and water from the produced water the lithium present in the produced water will be concentrated, making it a high potential feedstock to a lithium recovery process.

- Wellspring Hydro is seeking a process patent for removing salt from waste oilfield produced water which in turn concentrates the feed brine into a "mother liquor" stream. This concentrated mother liquor creates ideal feedstock as it increases the lithium by a factor of up to four times. This concentration allows for even more efficient extraction by Wellspring Hydro and its partner over the standard brine process. Due to this concentration upgrade, the potential for up to 3.5 tons of lithium extraction per week is achievable and will yield nearly 4M in accretive revenue and 91,000,000 gallons of water saved.

Production of High Value Commodity Products

Wellspring Hydro's project will produce commercially essential commodity products Caustic Soda and Hydrochloric Acid. Both products have current demand in industrial and energy sectors and future demand in the support of clean sustainable energy (Carbon Capture, Oil & Gas production, and lithium extraction). The primary focus of the plant will be to produce and sell caustic soda (at 50% and 25% NaOH concentration), hydrochloric acid (at 35% HCl concentration). All products are currently imported into North Dakota with limited regional production. All products will meet industry standards.

- Caustic Soda - Caustic soda will be sold locally and regionally for use in various heavy industries such as refineries, power stations, pulp mills and for carbon capture projects. Wellspring Hydro's products, specifically caustic soda, will be consumed in local and regional sustainable-clean-energy projects and designed to capture or sequester carbon from power generation. Wellspring Hydro will be a key chemical supplier to the burgeoning CCS/CCUS (Carbon Capture and Storage/Carbon Capture, Utilization and Storage) industry in North Dakota and surrounding states. Project Tundra at Milton R. Young station and Coal Creek Station will require substantial amounts of NaOH (caustic soda) to scrub sulfur dioxide (SO2) to zero. This need is driven by the Amine CO2 removal technology employed in large scale carbon capture such as those at power stations that utilize coal with sulfur content. Currently all Caustic Soda is imported into the State at a premium. Wellspring Hydro will be able to supply all the States projected needs.
- Hydrochloric Acid - The hydrochloric acid will be sold predominately into the local and regional oil and gas industry; other consumers include food processing and steel manufacturing industries in neighboring states. In North Dakota there is a significant opportunity to develop production enhancement acidification of existing wellbores and well recompletions to maximize the Williston Basins oil output. Many current producers utilize large acid jobs to open calcium carbonate scaled perforations and liners that restrict production. These large acid production

enhancement jobs are limited by cost and availability of HCl. WSH can help provide stability to production enhancement support the oil and gas industry through consistent supply.

- Optional Calcium Chloride Addition – Wellspring Hydro is also evaluating the production of a third product of liquid calcium chloride (35% CaCl2). This proven process reacts hydrochloric acid with limestone, which would allow the business to maximize operating rates and diversify the product portfolio. Liquid calcium chloride has a strong regional demand in the Upper Mid-west US and Canada for dust control and snow removal/de-icing.

Sustainable Use of Produced Water Waste

The execution of this project will solidify a sustainable business model built on the use of produced water waste, as defined as the Wellspring Hydro original opportunity statement.

- Through a circular economy model, 10,000 BBL per day will be used as feedstock to the salt recovery system and the Chlor-alkali facility to make products. The current disposal zone of the Dakota formation is experiencing over pressurization in certain areas, this challenge will continue as infield development of the Williston Basin continues. Wellspring Hydro offers an environmentally useful solution to simple injection.
- With an initial scope of 10,000 BBL per day, Wellspring Hydro has a vision to use technology developments for the opportunity to expand the scope and utilize more produced water. Expansion opportunities could come in various scopes; from another full-scale facility to components of this process including lithium extraction, calcium chloride production from produced water and other emerging opportunities.

Financial Impact

The business is projected to have a year one of $86.4 M revenue, split between HCL at $34.7 M, Caustic at $47.4 M, and produced water/other at $4.2M. The production volumes and product price forecasts are (detailed in the Business Plan) are diversified into different markets both local and regional.

- The current unleveraged financial returns yield a 21.3% IRR and $126.36 M NPV. Year 1 EBIDTA is projected to be $56.3 M with steady performance within +/- 5% consistency through year 5 EBIDTA at $58.8 M. This is based on a flat price forecast to represent a conservative approach and provide opportunity of long-term contract capability.
- The full-rate state tax on product sales is expected to be $5.5 M per year. The facility will employ a total of fifty-three employees, forty-six employees to support the cost of product and seven employees supporting administrative and company operations.

Facilities:

The facility will include a pre-treatment, evaporator/crystallizer system, chlor-alkali electrolytic cells, caustic evaporator, a hydrochloric acid synthesizer, and a Saltwater Disposal (SWD) well, and all associated utility, storage and loading facilities for bulk shipments via truck and rail.

Wellspring Hydro has selected the Marley Crossing area of SW Willams County for the location of the facility. This is due to many compelling factors including: Strategic salt water partnerships for significant and consistent supply of produced water on a 10 year contract basis, existing salt water pipeline

infrastructure, new salt water disposal facility built to specifications, ideal geological formation for disposal injection, large rail loop facilities on the BNSF line with capacity to rail out product, opportunity for attractive commercial agreements for power and gas.

Specific process facilities to include but not limited to:

- Salt Crystallizer & Evaporator
- Primary Brine Treatment: Brine Precipitation and Filtration
- Secondary Brine Treatment
- Brine Electrolysis
- Anolyte Handling and Dichlorination
- Catholyte Handling
- Excess Hydrogen Generation
- Chlorine Cooling & Demisting
- Cell Hydrogen Cooling & Demisting
- Hydrochloric Acid Synthesis
- Caustic Evaporation
- Sodium Hypochlorite Bleach Production & Emergency Vent System
- Liquid Calcium Chloride Production (Optional)
- Utilities

General and functional facilities include.

- Administration Offices
- Onsite Laboratory
- Storage Facilities: Water, Salt, Caustic Soda, Hydrochloric Acid

Resources:

Subject matter experts will assist in engineering, design, implementation, and construction.

Subject Matter Expert Resources	
Hargrove Engineers	Palmer Lawrence
Mastec Infrastructure	SHECO
FCI Constructors	Dixie Engineering
InDemand	Bertrams
Ekato	Verantis
DrM	TennyCo
Marmon Industrial Water	Mersen
American Crane	CEJCO
Applebee Church	Voigt-Abernathy
Verantis	Flowserve
BARR Engineering	ND Department of Environmental & Quality
North Dakota Industrial Commission	Grayson Mill Energy

Barr's role during this initial phase shall be to provide multi-media pre-permitting engagement and related strategic environmental consulting services. This engagement has already begun with permitting meetings with the NDIC and North Dakota DEQ (DEQ divisions represented were the Division of Water Quality, the Division of Air Quality, and the Division of Waste Management).

The Hargrove Detailed Design Engineering Team will include the following team. Resumes are available in Detailed Design Appendix.

Hargrove Detailed Design Team	
Resource Name	**Title**
Scott Cooper	Project Director
Jason Traylor, PE	Controls + Automation Technical Consultant
Adam Freund, PE	Senior Electrical Engineer
Andy Faulk, PE, LEED AP	Civil/Structural Engineering Lead
Glen Carter, PE	Civil/Structural Engineering Lead
Michael Gear	Mechanical Engineer
Jeff Haslam	Mechanical/Piping Technical Specialist
Reggie Chambliss	Process Engineer
Andrew Johnson	Project Controls Manager
Bill Johnson	Project Manager

Techniques to Be Used, Their Availability and Capability:

Independent, credible third-party resources will be utilized as identified in earlier sections. The subject matter expert resources will license their technology and services as a part of the procurement process to be implemented in the Wellspring Hydro design.

The availability of specialty process equipment is a critical component of the schedule with lead times of equipment reaching 14-16 months due to market constraints on key materials. As outlined in the loan fund request, Wellspring Hydro will utilize funds to secure availability with early downpayments on key items.

Environmental and Economic Impacts while Project is Underway:

On September 13th, 2023, Wellspring Hydro and Barr Engineering presented to the North Dakota DEQ with the purpose of providing updates and a continuation of previous communication on the project. The DEQ divisions represented were the Division of Water Quality, the Division of Air Quality, and the Division of Waste Management. Following this meeting the DEQ provided an update letter to the North Dakota Industrial Commission highlighting that the DEQ sees Wellspring Hydro as eligible to apply for all appropriate permits to construct and operate the proposed facility in the Trenton, ND area. The letter is attached in the appendix.

During the meeting with the DEQ, the question of permitting for produced water injection was reviewed. The Division lead for the Department of Water Quality reviewed the documentation available and had initial feedback that the proposed facility would be classified as a Class II injection well. This is due to the fact that the facility will only dispose of oilfield waste and while a significant amount of the sodium chloride salt, lithium and condensate fresh water will be removed from the produced water brine, no other waste streams from outside sources will be added into the disposal stream nor will significant amounts of additive chemistry be used. To further this determination, Wellspring Hydro followed up with the Underground Injection Control department of the NDIC, they preliminarily agreed with the DEQs direction. As the application is drafted with BARR engineering support Wellspring Hydro will continue to test this point and ensure that the most logical, safe, and appropriate route is taken for the local community, State and Facility.

Wellspring Hydro is committed to avoiding accidents and unplanned occurrences that may result in injury to employees, interruption of production, or damage to equipment or property. This policy, applies to every task undertaken, is to take every action necessary in engineering, planning, assigning, and supervising all jobsite operations to establish and maintain safe and healthful working conditions on our projects and protect the public and the environment.

During the scope of this project, there must be interaction between the Wellspring Hydro, Hargrove, and the appropriate North Dakota regulatory agencies to communicate details about the plant design including specific plans to address environmental and safety concerns. Wellspring Hydro, Hargrove and Mastec will work together to interpret and communicate the permit requirements so that the regulatory requirements are clearly and specifically understood by all the contractors. Williams County has taken

an active role in establishing construction and operations phase employee counts along with traffic surveys and logistical needs.

Wellspring will employ up to 250 contractors at peak construction phase. Wellspring Hydro has communicated with local authorities and plans will begin months prior to peak phase to establish transportation logistics and housing requirements for the influx of staff required to accomplish construction in an efficient manner.

The Site Manager will work with the environmental department to develop procedures for isolation of the project site for storm water runoff, testing, pumping and disposal of storm water from excavations, and containment areas. Any temporary breach of containment structures will also be addressed to assure that no contamination will reach the storm water systems.

Fire water tank installment will be critical to establishment of the site for Wellspring Hydro. The size of the take will be appropriate for the development of the site and will be filled prior to operational start up. If other companies are building in the area a coordinated effort will be made to build out and support a local fire staff and EMS plan with local community leaders which will cover the entirety of the site build out.

Ultimate Technological and Economic Impacts:

This is a first of its kind process utilizing well known and understood chlor-alkali technology that has been available since the 1970's. While oilfield brine is becoming more commonly reused, recycled, and even crystallized to derive value driven products, to our knowledge there are no other chlor-alkali plants in the world that uses oilfield produced water as its feedstock for salt. We have patented a process to leverage this waste stream to create products which are used in the industry as well as create net new surface fresh water, water that did not exist as fresh water before. The new fresh water will be used exclusively by our plant as process water needs such as cooling, ultrapure brine, cathode dilution, and salt saturation.

The business is projected to have a year one of $82.6 M revenue and support 53 full time employees. The current unleveraged financial returns yield a 21.7% IRR and $170.0 M NPV. Year 1 EBIDTA is expected to be $54.0 M with steady performance within +/- 5% consistency through year 5 EBIDTA at $53.8 M. The full-rate state tax on product sales is expected to be ~$5.5 M per year. There will be partnership opportunities as highlighted in the Standards of Success that could have an even larger initial Economic Impact.

Why the Project is Needed:

This plant will be designed to enable recovery of more valuable salts and elements. All products to be made by Wellspring Hydro are presently consumed by businesses and industries in North Dakota but are imported from other states. This project represents a new industry for North Dakota, creating sustainable jobs and tax revenues in the state.

The output will benefit North Dakota by proving out a new concept to recover salt from a waste stream from the oil and gas fields and using it to make valuable products which are used in the industry, i.e. hydrochloric acid, caustic soda, with the potential of calcium chloride and a small amount of sodium hypochlorite (bleach) required in the State and region. All these products are used to some extent in the oil and gas industry, excess production will be exported out of state, thus generating new income for the state. In addition to the valuable commodities that will be recovered, the current disposal zone of the Dakota formation is experiencing over pressurization in certain areas, this challenge will continue as development of the Williston Basin continues. Wellspring Hydro offers an environmentally useful solution to over pressurization.

Wellspring Hydro will systematically manage our power, water, and carbon footprint to underpin North Dakota's goals as a multi-resource energy policy state. Our products support more efficient oil production, lower carbon capture costs, and resource attainment of previous waste streams. Overall Wellspring Hydro's proven concept may be utilized again as North Dakota's petrochemical industry grows.

1. Local Production of key products
2. Sustainable Produced Water Source
3. Lithium Production

STANDARDS OF SUCCESS

Various standards of success will be identified and employed to solve the technical hurdles herein. These standards examine both the technical and commercial aspects of the project while adding depth and outlining value.

Reduced Environmental Impacts

Oil and gas operations in the Williston Basin dispose of 1.5 - 1.8 million barrels (63-75 million gallons) of produced water per day. This is 25% more than all the industrial process water use in North Dakota. Wellspring Hydro's scope focuses on a portion of this current waste stream and our vision is to create valuable commodities and rare earth metals extraction through alternate water utilization.

Wellspring Hydro will separate salt and fresh water from produced water; the remaining concentrated stream (referred to as "mother liquor") will be sent to additional processes and eventually to SWD after all useful material can be economically derived. This process of crystallization, concentration and extraction will lead to a 40% reduction in produced water disposed and creation of net new freshwater, used as project process water.

The elevated concentration of remaining elements in the "mother liquor" such as lithium and magnesium along with other salts and metals, create potential for further value-added processing. Beyond the valuable commodity chemistries and essential elements, Wellspring Hydro being a first of its kind facility with healthy returns also sees itself as a champion for further process and product development in the areas of, Environmental Stewardship, Energy Efficiency, Sustainability, Economic Diversification, and Jobs Creation.

Increased Energy Efficiency

Wellspring Hydro will be a key chemical supplier to the burgeoning CCS/CCUS (Carbon Capture and Storage/Carbon Capture, Utilization and Storage) industry in North Dakota and surrounding states. The Northern Plains are known for their vast coal reserves and critical baseload power generation, however changing climates both political and environmental related are now signaling the importance of CCS/CCUS. Technological advances, tax incentives, and attractive geologic CO2 target zones in North Dakota are leading to testing for storage zones and will soon place North Dakota on top as the world leader in carbon capture. To achieve the status of the world's leading carbon capture State, projects such as Project Tundra at Milton R. Young station and Coal Creek Station will require large amounts of NaOH (caustic soda) to scrub sulfur dioxide (SO2) to zero. This need is driven by the Amine CO2 removal technology employed in large scale carbon capture such as those at power stations that utilize coal with sulfur content. Currently all Caustic Soda is imported into the State at a premium. Wellspring Hydro will be able to supply all the States projected needs and will have 50% of its NaOH as a net export for the state to surrounding states.

Specific to the Wellspring Hydro plant, a large part of the power demand will interruptible, a benefit in managing and balancing North Dakota's electrical grid during periods of high demand. As of the

submission of this document, no less than four potential partner companies have expressed interest in striking deals for natural gas Co-Gen power generation to use stranded in-basin natural gas that may otherwise hamper oil production. Micro-grid wind, solar, heat pumps and battery backup are part of the office facility build out scope pending tax incentive confirmation and financial justification.

While Wellspring Hydro itself will have the ability to invest in a small carbon capture facility totaling up to 23,000 tons per year (as an added scope), it will not benefit from the Q45 tax credit initially due to size. Two potential partners have reached out to WSH to better understand potential carbon capture and fit. Both companies have expressed interest in "testing current technologies" in conjunction with the chlor-alkali facility.

Energy Sustainability

Lithium extraction in North Dakota by Wellspring via Brine Extraction is attractive for the Williston Basin area and North Dakota for many reasons; it does not require the surface area needed when compared to traditional solution mining which demands large evaporation ponds. The potential for carbon neutrality is feasible with further partnerships focused on natural gas combustion stream aggregation or direct air capture (DAC) technologies of which Wellspring Hydro is engaged in multiple conversations with companies offering both. The water used in Wellspring hydro's process is water that is recycled from the influent produced water stream. The process does not need the 500,000 gallons of water traditionally required to extract a single ton of lithium, Lastly, the process requires hydrochloric acid and caustic soda which Wellspring Hydro will produce at its plant. This synergistic effect further reduces the production cost of North Dakota lithium.

Wellspring Hydro's patented process of removing salt from oilfield produced water waste concentrates the feed brine into a "mother liquor" stream. This concentrated mother liquor creates ideal feedstock as it increases the lithium by a factor of up to 4x. This concentration allows for even more efficient extraction by Wellspring Hydro and its partner over the standard brine process. Due to this concentration upgrade, the potential for up to 3.5 tons of lithium extraction per week is achievable and will yield up to $4M in accretive revenue and 91,000,000 gallons of water saved. Lithium production in North Dakota will provide sustainable energy and local supply chain to meet the growing lithium demand – specifically in electric vehicles.

Value to North Dakota

This project can lead to significant environmental, technological, and economic impacts to the state of North Dakota. Through the successful implementation of this project, Wellspring Hydro will help demonstrate the value of produced water from Oil & Gas operations while allowing for further innovative testing onsite. The ultimate standard of success would be to provide North Dakota with a key piece in a future petrochemical strategy.

Explanation of How the Public and Private Sector will make use of the Projects Results, and when, and in What Way

By the end of 2025, carbon capture projects, oil and gas and other local industries will enjoy up to a 30% cost reduction and consistent supply of essential commodities. This is driven by a subsidized feedstock of produced water from oil and gas production and/or salt cavern development. Caustic soda (carbon capture, crude refining, bio refining, gasification water process treatment, power generation water treatment, lithium extraction), Hydrochloric Acid (oil and gas operations, lithium extraction), and North Dakota Counties (Calcium Chloride – dust control, oil and gas) will all benefit from Wellspring Hydro's strategic location, differentiated feedstock, and low operating cost in Western North Dakota. These products which are all purchased outside of North Dakota currently will immediately realize a large logistical cost savings over current suppliers who rely on rail and trucking to bring current products in from thousands of miles away. Caustic soda is essential in water treatment performed as a part of routine preventative maintenance at many industrial plants in North Dakota, however the largest use of caustic will be sulfur dioxide scrubbing at the planned carbon capture projects at Milton R. Young Station and Coal Creek Station power plants. These projects will together consume nearly half of Wellspring Hydro's caustic soda production. Current supply chains are not set up for this increase in use by North Dakota which would only lead to higher than projected operating costs or potential delays and shutdowns due to lack of consistent supply without Wellspring Hydro to fill the increased caustic need by these essential projects.

Currently oil and gas completions and operations are finding it difficult to locate consistent hydrochloric acid streams and most transloading companies are looking to bring in product from as far away as Texas where they must compete with the Permian Basin demand. This adds delays and significant cost increases due to long logistics routes and creates supply-demand constraints on the limited existing streams. Wellspring Hydro's plant would eliminate the need for North Dakota oil and gas producers to go outside the State for hydrochloric acid and furthermore would allow for North Dakota to become an exporter of HCl to the surrounding region.

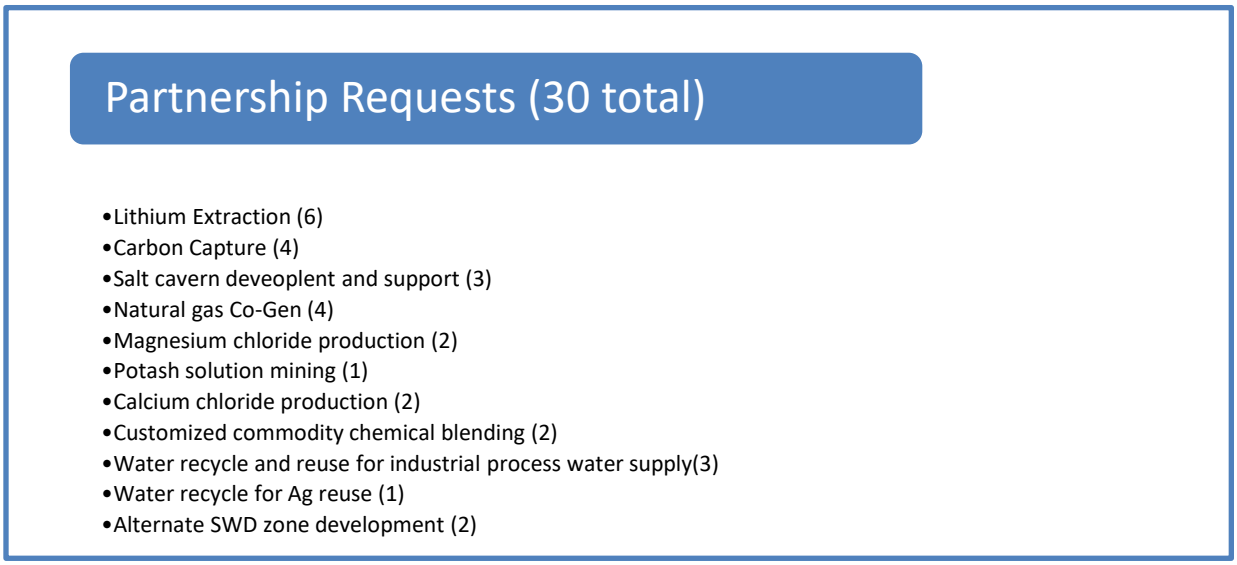
Wellspring Hydro will evaluate an expansion into Calcium Chloride production, which has significant value to both the private and public sector. Like oil and gas operators, the counties in North Dakota purchase many commodity products that must be trucked or railed in from out of state. Magnesium Chloride ($MgCl_2$) and Calcium Chloride ($CaCl_2$) both come exclusively from out of state production. North Dakota and surrounding states (SD, MT, MN) utilize a high volume of these products for dust control. The annual consumption of calcium chloride for North Dakota is 5.6 thousand metric tons, and 18.1 thousand metric tons for the surrounding states. In addition, the US and Canada are large consumers of deicing products due to harsh winter conditions. $CaCl_2$ outperforms $MgCl_2$ and has a lower environmental impact. Wellspring Hydro has the operational flexibility to produce a large portion of the $CaCl_2$ used by North Dakota and export to the surrounding states.

How the project will enhance the research, development and technologies that reduce environmental impacts and increase sustainability of energy production and delivery of North Dakota's energy resources.

Wellspring Hydro will enhance the development and operations of technologies that reduce environmental impact by suppling crucial raw materials to processes used in carbon capture. Materials that will have the lowest environmental footprint of any commodities on the market. This is due to extremely short supply chains, a zero-emission production facility, and use of a current waste stream for a feedstock.

With its own facility, Wellspring Hydro will work to create a proposed test facility to implement and trial new and emerging technologies and processes. The focus of which would be threefold in a nonspecific order, first to reduce environmental impact, second to lower cost associated with WSH and adjacent projects, third to remain on the forefront of developments in the energy and commodity sectors.

To date Wellspring Hydro has discussed partnerships with companies covering.



It is important to remember the listed partnership opportunities will be completely stand-alone partnerships, JVs, or licensing opportunities. These will only represent the upside on the current business plan and financial outlook through combined synergies. The opportunities listed show the strategic nature of looking at our assets in North Dakota from a different vantage point which allows for the investigation of innovative ideas in a field environment following laboratory confirmation.

How it will preserve existing jobs and create new ones.

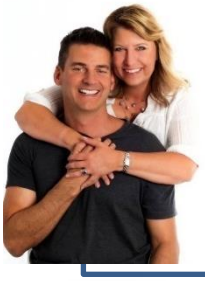
Wellspring Hydro will preserve existing jobs by supporting the oil and gas industry through lower costs, readily available commodities to ensure wells can be completed and produced at a $/barrel that is in line with that of competing states. The Wellspring Hydro production plant will create fifty-three full-time high-paying jobs ranging from front office to production crews.

As detailed in the previous section, Wellspring Hydro's unique intersection of industrial process, commodities production, and oil and gas water reuse it will present an opportunity for further testing and expansion for innovation in an environmentally sustainable format due to the inherent natural assets in Northwestern North Dakota.

BACKGROUND/QUALIFICIATIONS

Leadership Team

Wellspring Hydro management team is supported by industry and local resources to develop a robust business plan and positioned to execute with investment.



Steve and Carla Kemp, Founders, Wellspring Hydro.

- Steve and Carla are local entrepreneurs that founded Wellspring Hydro in 2016 and are based in Williston, ND. Steve and Carla have started multiple ventures in IT, real estate, and financial markets.

Mark Watson, CEO, Wellspring Hydro.

- Mark has over 14 years-experience in acquisitions/mergers, project management, and entrepreneurial start-ups. Mark, MBA, specializes in developing business plans, financial modeling, marketing analysis, and valuation/capital funding.

Mat Hirst, COO, Wellspring Hydro.

- Mat has over 16 years-experience in developing sales and operations teams in the oil and gas industry. Mat, based in Bismarck, ND, specializes in water technologies with expertise in executing sales strategies, people management, and driving operational efficiencies.

Norm Christensen, Technical Advisor, Wellspring Hydro.

- Norm's career has spanned more than 40 years, including direct involvement in the chlor-alkali industry in both North and South America. A chemical engineer, Norm has held senior positions in both Fortune 100 and small companies in engineering, operations, sales and marketing and general management roles. Norm recently (2015) oversaw on the construction of a chlor-alkali facility in San Antonio, TX.

Wellspring Hydro Consultants:

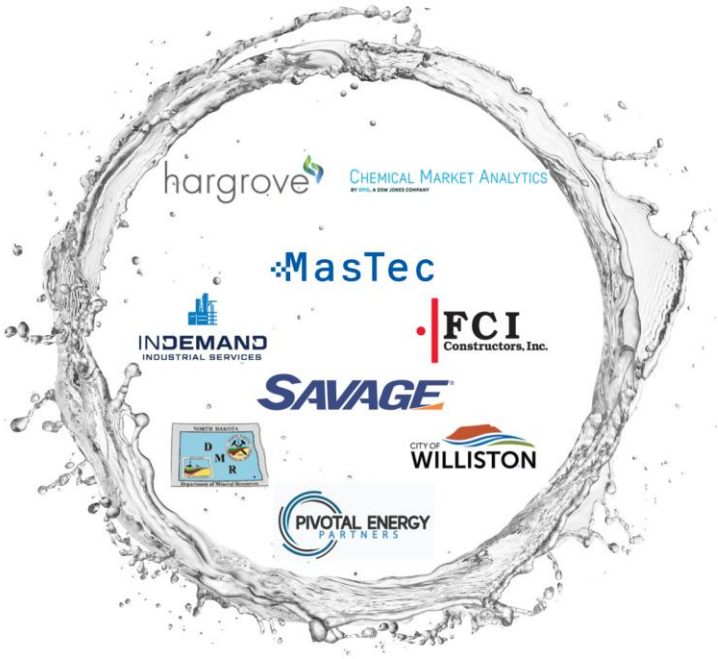
- Chris Wunz, Consultant. Subject Matter expert on Water Treatment and Salt Crystallization. Chris has 20+ years of experience in salt crystallizers and produced water operations.
- Bob Martin, Consultant. Expert on Chlor-Alkali mechanical and process. Bob has 40+ Years of Industry experience on Chlor-alkali facilities around the globe.
- Bob Schmidt, Consultant. Expert on Chlor-Alkali electrical and instrumentation. Bob has 30+ Years of Industry experience on Chlor-alkali facilities around the globe.

Partners & Suppliers

Wellspring Hydro has worked with subject matter experts to validate components of the business plan from our engineering leads and local partners.

A few key leads from the project team consists of the following individuals:

- **Scott Cooper,** Project Lead, Hargrove Engineers + Constructors. Scott has thirty years of experience working in project management and design engineering. Has established project procedures, coordinates changes in scope, monitors and controls engineering activities, cost analysis, planning, scheduling, estimating, procurement of process equipment. Scott is the project lead for the Wellspring Hydro FEL-2 and upcoming FEL-3 projects.
- **Justin C Merritt**, P.E, Hargrove Engineers + Constructors. Justin has over eighteen years of experience in a variety of process industries, including chlor-alkali, petrochemicals, minerals processing, biofuels, and lithium. Project experience includes work on six chlor-alkali plants.
- **Amanda Hayes**, Process Engineer, Hargrove Engineers + Constructors. Amanda has over fifteen years of experience as a Process Engineer in the chemical industry. Experience in writing procedures, process safety management, root cause analysis, and process studies.
- **Bill Johnson**, Project Manager, Hargrove Engineers + Constructors. Bill has over twenty-five years of experience as a Process Engineer in the chemical industry. Experience in writing procedures, process safety management, root cause analysis, and process studies.
- **Chuck Carr**, VP Strategic Insights, Chemical Market Analytics (Formerly IHS Markit). Chuck serves as the group lead for consulting projects, primarily responsible for the sale and execution of consultant engagements in the Americas region.



MANAGEMENT

Wellspring Hydro will operate a steering team consisting of the Wellspring Hydro management team, Hargrove project and engineer leads and Tormod operations group. The steering committee will meet monthly to review the strategic process of execution including project timeline, cost projections, regulatory approvals and other critical item highlighted by the working team.

Monthly Steering Team Meetings

Executive Review with the steering team to evaluate progress and assess critical actions, risk register and schedule.

The project will be organized as an integrated team, containing representatives from both Wellspring Hydro, Mastec and Hargrove. The Activities of the project will be coordinated by a core Project Team, the main members of which will be: (full role descriptions available for reference in business plan)

Weekly Project Meetings

During the kick-off meeting for Initial Detail Design, an agreement for the time, place and format of the weekly project meeting will be agreed upon. The purpose of this meeting is to maintain an open line of communication between all parties. These meetings will be transitioned to the field during the construction phase. The agenda will be as follows:

- Upcoming Safety Reviews
- Design Safety Concerns
- Calendar of Events
- Planned Field Trips
- Last Week Accomplishments
- Key Milestones for the Coming Week
- Outstanding Action Items
- Schedule
- Current week releases
- Events

Weekly Reports and Meetings

The Project Manager will issue weekly progress reports which will describe the progress of Hargrove services and of other project participants and will evaluate the progress and performance of the project team against the project plan. The weekly meeting format will be changed to focus on issues that need attention and should publish meaningful and useful metrics that update everyone on progress versus plan.

Wellspring Hydro Steering Team			
Mark Watson			
Scott Cooper			
TBD - Investor Appointed Lead			
TBD - Third Party Industry Expert			
Engineering Stage		**Construction Stage**	
Role	**Lead**	**Role**	**Lead**
Operations Lead – Mat Hirst			
Wellspring Project Manager	TBD	Construction Manager	Mastec
Hargrove Process Principal	Scott Cooper	Site Manager	Mastec
Hargrove Project Engineer	Bill Johnson	Quality Manager	Mastec
Wellspring Process Lead	Norm Christensen	Field Materials Supervisor	Mastec
Wellspring Start-Up Manager	TBD	Controls Manager	Mastec

Wellspring Hydro Operations Lead – Mat Hirst

Finalize the plant data by the development of the Engineering contractor's data to include commissioning and other records required for the future operation of the plant. Identify system start-up requirements.

Wellspring Hydro Project Manager – TBD

Accountable to the Steering Committee; acquire, direct, and control all the resources required to implement the project from development through to beneficial manufacture so that the business intent, as expressed in the Project Proposal or subsequent amendments, can be achieved.

Hargrove Project Principal – Scott Cooper

Accountable to the Wellspring Hydro Project Manager, the role holder will be responsible for the provision of Hargrove resources to deliver the project scope of work.

Hargrove Project Engineering Manager – Bill Johnson

Accountable to the Hargrove Project Principal, and responding to the Wellspring Hydro Project Manager, the role holder will be responsible for the coordination of design activities to meet the project time, cost, and quality targets.

Wellspring Hydro Process – Norm Christensen

Responsible for the production review of process packages including PFDs, P&IDs, equipment data sheets and process description.

Wellspring Hydro Start-up Manager – TBD

Define and implement a start - up plan, detailing Plant Systems, procedures, resources, and responsibilities for all stages of plant turnaround and commissioning by setting and monitoring measures of performance in order to achieve the agreed schedule.

Construction Manager – Mastec

Mastec will utilize its construction management organization to fulfill its construction obligations. Mastec will manage all construction activities required to complete the work to the point of being ready for commissioning.

Site Manager - Mastec

The site manager will report to the project manager on the project and will coordinate all functions with the Wellspring Hydro Operations Manager for all construction-related matters. The site manager will be responsible for:

Quality Manager - Mastec

The Project Quality Manager will perform or cause to be performed those inspections required by the project specifications. He will also review and approve the Quality Plans of all the subcontractors and audit the quality control records of the contractors (e.g., welder certifications).

Field Materials Supervisor - Mastec

The field materials supervisor will be responsible for all field procurement-related activities including receiving, inspecting, and warehousing all engineered items at the site. Field purchasing of bulks will be performed by the individual trade contractors.

Controls Manager - Mastec

During construction, the project controls manager will be responsible for coordinating cost, planning, and scheduling activities of all subcontractors to provide the management tools for controlling construction cost and schedule. Reporting will be provided to Wellspring Hydro which will be appropriate to the form of contracts and as determined the project controls plan.

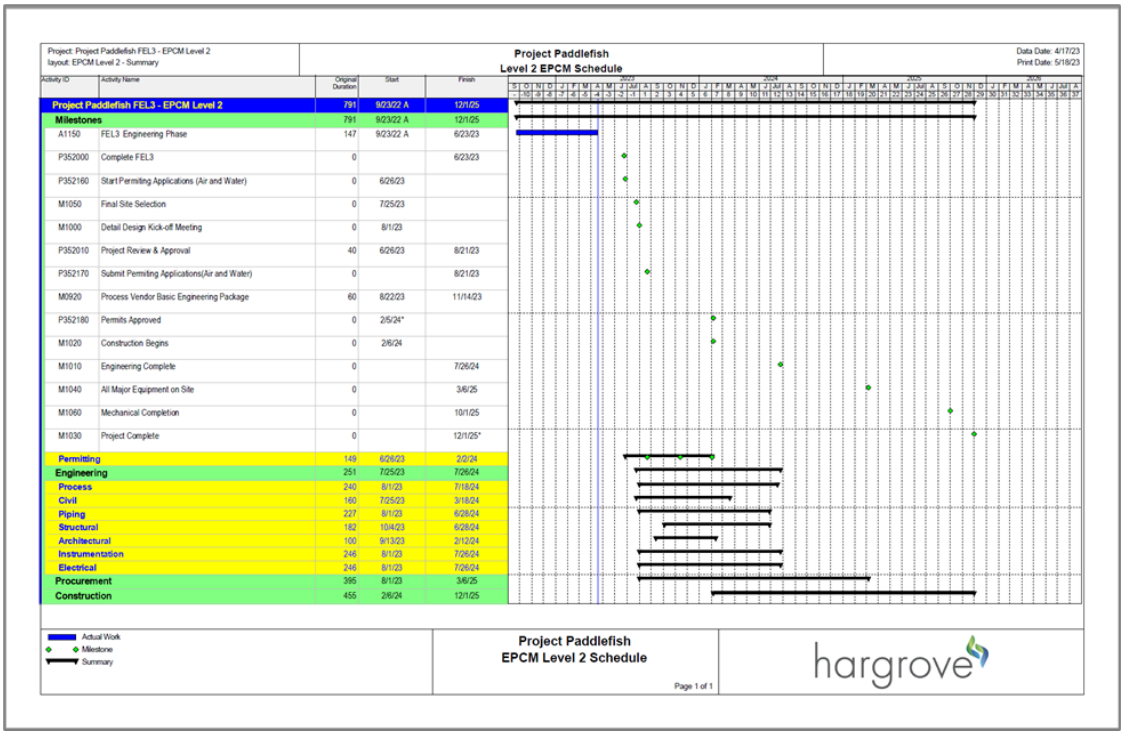
TIMETABLE

The timeline is based cumulative outlook for the FEL-3 study, market research study and the combined output analysis.

Critical Milestones:

Milestone	Milestone Date
FEL-3/DD Kick-off Meeting	15 Feb 23
FEL-3 Complete	15 Jun 23
Field Validation – Technology and Commercial	01 Nov 23
Financial Investment Decision (FID)	01 Jan 24
Procurement of Specialized Equipment	01 Mar 24
Detailed Design Engineering Start	01 Apr 24
Construction & Civil Mobilization	04 Jul 24
Detail Design Complete	20 Feb 25
All Major Equipment	03 Jul 25
Mechanical Completion	05 Oct 25
Start-Up & Commissioning	01 Jan 26

Full Project Timeline:



BUDGET

As referenced in the management section, Wellspring Hydro will have monthly updates on cost/budget reports in addition to the criteria set by the CSEA process.

Project Associated Expense	NDIC's Share	Applicant's Share (Cash)	Applicant's Share (In-Kind)	Applicant's Equity Investment	Total
Technical and Commercial Viability	$2,000,000*			$2,000,000	$4,000,000
Initial Detailed Design	$3,000,000*	-	-	$3,000,000	$6,000,000
Detailed Design	$5,000,000**			$5,000,000	$10,000,000
Process Equipment	$25,000,000***			$25,000,000	$50,000,000
Chlor-Alkali Facility				$254,760,000	$254,763,000
Total	$35,000,000	-	-	$289,763,000	**$324,763,000**

***Designates grant fund budget from CSEA grant award in Aug. 2023 - $5,000,000 USD**

- Technical and Commercial Viability - $5,000,000 USD
    - Consultants and Technical Support - $506,550 USD
    - Stage 1 Field Trial - $650,000 USD
    - Stage 2 Field Trial - $3,843,350 USD
- Initial Detailed Design - $5,000,000 USD
    - Quoted by Hargrove as first 6 months of detailed design for required engineering and technical support to make procurement decisions.

**** Designates grant fund request on Nov. 2023 - $10,000,000 USD ($5,000,000 USD grant request)**

Detailed Design - $10,000,000 USD

- Quoted by Hargrove and represented in the scope of work in the exhibit of Hargrove Detailed Design Proposal – Wellspring Hydro.
- A 12-month scope of final design to support the building and operation of the facility prior and during construction.

***** Designates loan fund budget - $50,000,000 USD ($25,000,000 USD loan request)**

- Specialized Process Equipment - $40,480,594 USD
    - Critical long-lead equipment that has been quoted at 1-2 year lead time based on orders. To meet the timeline, these items will need to be ordered immediately to avoid installation and start-up delays. The items listed below have been quoted and ready for order at an average of 12-14 months.

WBS	Type	Name	Vendor	Description	FEL3 Estimated $	Estimate Source
U1-2000	PKG	Salt Crystallizer	Alfa Laval	MVR	$ 15,000,000	+/-30%
U2-5000	PKG	HCl Synthesis Unit #1	Mersen	70 MTPD skid	$ 3,012,000	+/-10%
U2-5000	PKG	HCl Synthesis Unit #2	Mersen	70 MTPD skid	$ 3,012,000	+/-10%
U2-3000	RX	Chlor-Alkali Electrolyzer #1	INEOS	Ineos BICHLOR - 2 packs, 57 modules per pack	$ 2,459,195	+/-10%
U2-3000	RX	Chlor-Alkali Electrolyzer #2	INEOS	Ineos BICHLOR - 2 packs, 57 modules per pack	$ 2,459,195	+/-10%
U2-4000	PKG	Caustic Evaporator	Bertrams	Triple Effect Falling Film Evap Plant - 172 STPD	$ 2,294,155	+/-10%
U2-2000	PKG	Brine IX Skid	Marmon Industrial Water	(3) Brine IX sized for 320 gpm brine throughput. S	$ 1,720,000	+/-10%
ER	PKG	North Electrical Room	Harvard Integrations	ER01	$ 1,365,395	+/-10%
ER	PKG	South Electrical Room	Harvard Integrations	ER02	$ 1,465,395	+/-10%
ER	PKG	480/410VDC POLARIZATION RECTIFIER A	FRIEM	480/410VDC	$ 120,245	+/-10%
ER	PKG	480/410VDC POLARIZATION RECTIFIER B	FRIEM	480/410VDC	$ 120,245	+/-10%
ER	PKG	10.76MVA TRANSFORMER/RECTIFIER A	FRIEM	10.76MVA	$ 1,402,000	+/-10%
ER	PKG	10.76MVA TRANSFORMER/RECTIFIER B	FRIEM	10.76MVA	$ 1,402,000	+/-10%
ER	PKG	MVSWGR-1000 (ER01)	Eaton	13.8V SWITCHGEAR	$ 597,654	+/-10%
ER	PKG	4160V MV VFD	Rockwell	4160V	$ 339,038	+/-10%
ER	PKG	XFMR-1001 - 12.8v/480v TRANSFORMER (er01)	Eaton	W/DISCONNECT SWITCH	$ 446,000	+/-10%
ER	PKG	XFMR-1002 - 12.8v/480v TRANSFORMER (er01)	Eaton	W/DISCONNECT SWITCH	$ 446,000	+/-10%
ER	PKG	XFMR-2001 - 12.8v/480v TRANSFORMER (er01)	Eaton	W/DISCONNECT SWITCH	$ 446,000	+/-10%
ER	PKG	XFMR-1001 - 12.8v/480v TRANSFORMER (er01)	Eaton	W/DISCONNECT SWITCH	$ 446,000	+/-10%
ER	PKG	LVSWGR-1001 480 SWITCHGEAR	Eaton	MAGNUM PXR	$ 638,992	+/-10%
ER	PKG	LVSWGR-2001 480 SWITCHGEAR	Eaton	MAGNUM PXR	$ 644,542	+/-10%
ER	PKG	LVSWGR-2002 480 SWITCHGEAR	Eaton	MAGNUM PXR	$ 644,542	+/-10%
			Total		**$ 40,480,594**	

- Civil Construction - $9,517,406 USD
    - Early civil construction will allow Wellspring Hydro to avoid any weather constraints. Civil construction will position buildings to be constructed prior to weather in order to streamline the installation of process equipment.
    - This represents about 50% of civil construction, as the focus is foundation and base infrastructure to construct buildings. Other key components like Rail Infrastructure do not have critical milestones or dependencies on the full execution.

CONFIDENTIAL INFORMATION

A person or entity may file a request with the Commission to have material(s) designated as confidential. By law, the request is confidential. The request for confidentiality should be strictly limited to information that meets the criteria to be identified as trade secrets or commercial, financial, or proprietary information. The Commission shall examine the request and determine whether the information meets the criteria. Until such time as the Commission meets and reviews the request for confidentiality, the portions of the application for which confidentiality is being requested shall be held, on a provisional basis, as confidential.

If the confidentiality request is denied, the Commission shall notify the requester and the requester may ask for the return of the information and the request within 10 days of the notice. If no return is sought, the information and request are public record.

Note: Information wished to be considered as confidential should be placed in separate appendices along with the confidentiality request. The appendices must be clearly labeled as confidential. If you plan to request confidentiality for **reports** if the proposal is successful, a request must still be provided.

To request confidentiality, please use the template available at http://www.nd.gov/ndic/CSEA-app-doc-infopage.htm.

Wellspring Hydro has submitted for the attached Business Plan as confidential information by CSEA and the state of North Dakota. This document holds confidential and proprietary information around the research, development, and execution of the novel Wellspring Hydro project.

PATENTS/RIGHTS TO TECHNICAL DATA

Any patents or rights that the applicant wishes to reserve must be identified in the application. If this does not apply to your proposal, please note that below.

This is a first of its kind process utilizing well known and understood technology that has been around since the 1970's. As included in the CSEA Grant scope from December 2021, Wellspring Hydro will complete the process patent application with the results of the FEL-3 defined engineering and design study. This process patent will illustrate a process to leverage this waste stream to create products which are used in the industry as well as create net new fresh surface water. This process is expected to begin in June 2023.

STATE PROGRAMS AND INCENTIVES

Any programs or incentives from the State that the applicant has participated in within the last five years should be listed below, along with the timeframe and value.

Wellspring Hydro has a long-standing partnership with North Dakota from the original concept stage supported by UND, NDIC and City of Williston. The support from the state has allowed Wellspring Hydro to fund the research and development into this novel process (patent pending).

Agreement	Company/Division	Investment	Commentary
Research Grant	NDIC	$110,000	Concept support with UND partnership starting in 2016
Grant Match	City of Williston Star Fund	$225,000	Investment into Concept Stage and FEL-2 Engineering with development in Trenton
Promissory Note	ND Dev Fund	$250,000	Investment into successful FEL-2 engineering and design work in 2020
Promissory Note	ND Dev Fund	$750,000	Investment into commercial and technical development, highlighted by Veolia Pilot Lab
Grant	NDIC – CSEA Fund	$1,000,000	CSEA Grant awarded in December 2021 for FEL-3 engineering & design
Grant	NDIC – CSEA Fund	$5,000,000	CSEA Grant awarded in August 2023 for field validation & initial detailed design
Total Investment		**$7,335,000 USD**	

*Promissory notes and grant detail can be provided upon request.

APPENDIX

Tax Liability Statement

Industrial Commission

Tax Liability Statement

Applicant:
Wellspring Hydro, dba Triple 8 LLC

Application Title:
Unlocking the Full Potential of Produced Water as a Key Component of Clean Sustainable Energy

Program:

- ☐Lignite Research, Development and Marketing Program
- ☐Renewable Energy Program
- ☐Oil & Gas Research Program
- ☑Clean Sustainable Energy Authority

Certification:
I hereby certify that the applicant listed above does not have any outstanding tax liability owed to the State of North Dakota or any of its political subdivisions.

Signature

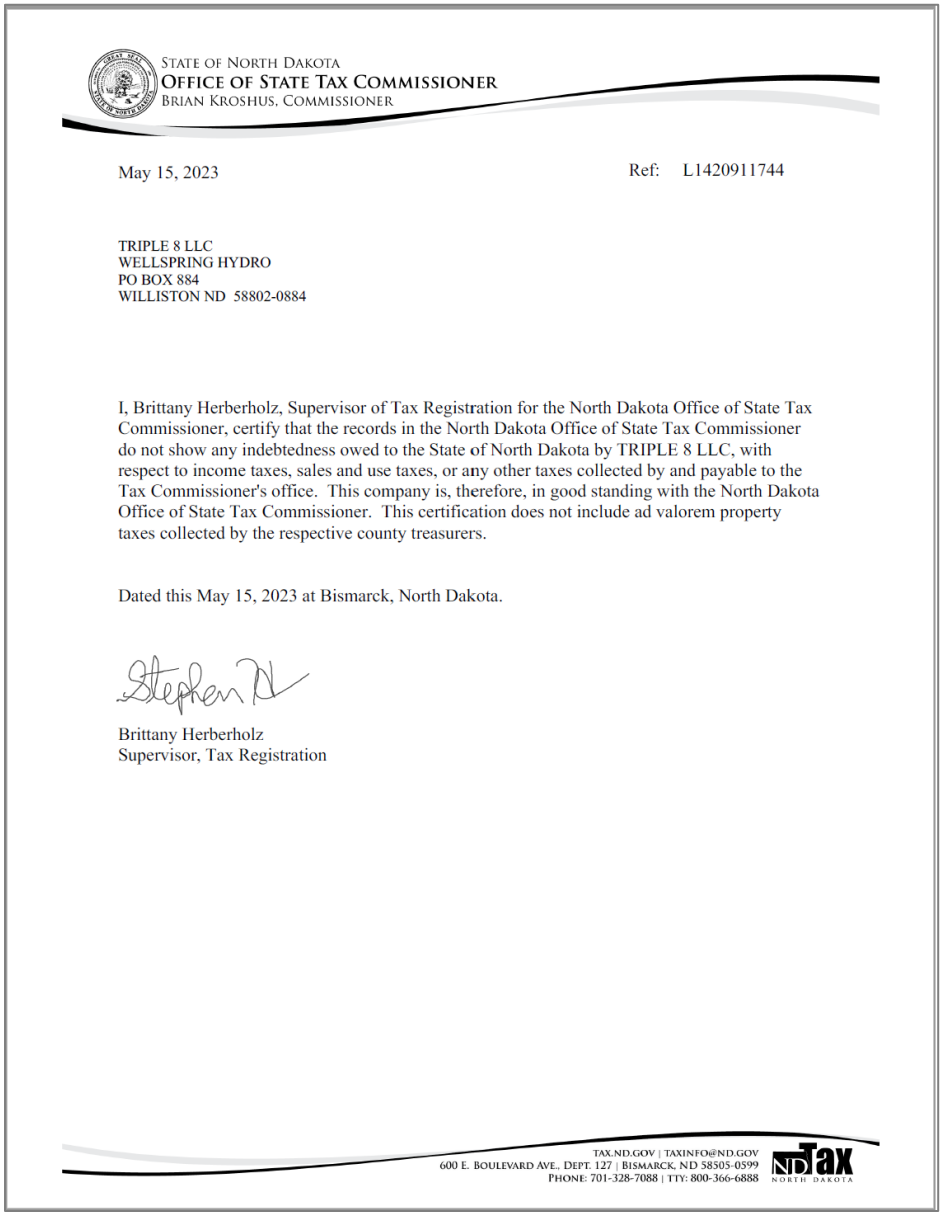
CEO

Title

11/1/2023

Date

Tax Standing Letter



STATE OF NORTH DAKOTA
OFFICE OF STATE TAX COMMISSIONER
BRIAN KROSHUS, COMMISSIONER

May 15, 2023 Ref: L1420911744

TRIPLE 8 LLC
WELLSPRING HYDRO
PO BOX 884
WILLISTON ND 58802-0884

I, Brittany Herberholz, Supervisor of Tax Registration for the North Dakota Office of State Tax Commissioner, certify that the records in the North Dakota Office of State Tax Commissioner do not show any indebtedness owed to the State of North Dakota by TRIPLE 8 LLC, with respect to income taxes, sales and use taxes, or any other taxes collected by and payable to the Tax Commissioner's office. This company is, therefore, in good standing with the North Dakota Office of State Tax Commissioner. This certification does not include ad valorem property taxes collected by the respective county treasurers.

Dated this May 15, 2023 at Bismarck, North Dakota.

Brittany Herberholz
Supervisor, Tax Registration

TAX.ND.GOV | TAXINFO@ND.GOV
600 E. BOULEVARD AVE., DEPT. 127 | BISMARCK, ND 58505-0599
PHONE: 701-328-7088 | TTY: 800-366-6888

Primary Sector Certification

NORTH Dakota | Commerce
Be Legendary.™

July 15, 2020

Steve Kemp
Wellspring Hydro
PO Box 884
Williston, ND 58802

Dear Steve:

Thank you for your application for primary-sector certification by the North Dakota Department of Commerce, Economic Development & Finance Division. We have reviewed your application and determined that ED&F can certify your company, **Wellspring Hydro**, as primary sector and a new wealth creator in the economy of North Dakota. This certification is valid for **four years** from today's date (expires 7/14/2024).

Most of North Dakota's economic development programs, tools and incentives are targeted toward primary-sector clients. You may be requested to provide a copy of this primary-sector certification letter when you apply for certain economic development incentive and funding programs.

This certification does not guarantee the receipt of any North Dakota business incentive. For example, there are additional qualification criteria for the Seed Capital Investment and Agricultural Business Investment personal income tax credits, and it is critical that investments **NOT** be made prior to the business receiving certification for these two credits. If you are pursuing certification for investment tax credits and need to know the criteria required for qualification, contact Joe Cicha 701-328-7283.

This certification is not the application process for the North Dakota New Jobs Training Program administered by Job Service North Dakota. To apply for the North Dakota New Jobs Training Program, you must contact Job Service North Dakota for the required application forms. Application forms for other programs that require primary sector certification are available from the agency administering the program.

Also, companies and individuals pursuing the investment tax credit incentive are reminded there is a cap on available dollars. Please visit with the ND Office of the Tax Commissioner regarding the remaining balance for investment tax credits. The credits are available on a first-come-first-serve basis until the law-defined cap is met.

North Dakota appreciates your contribution to the citizens and economy of our state. If there is anything further we can do to assist your company, please contact us at 701-328-5300.

Sincerely,

James Leiman, Director
Economic Development & Finance Division

1600 E Century Avenue, Suite 2 | P.O. Box 2057 | Bismarck, ND 58502-2057
PHONE: 701-328-5300 | TOLL-FREE: 1-866-4DAKOTA | ND RELAY TTY: 1-800-366-6888 | VOICE: 1-800-366-6889 | NDCommerce.com

Letter of Support – City of Williston 1

CITY OF WILLISTON
ADMINISTRATION

May 17, 2023

Clean Sustainable Energy Authority
600 East Boulevard Ave
Bismarck, ND 58505

Subject: Letter of Recommendation for Wellspring Hydro's Chlor Alkali and Lithium Mining Project

Dear Members of the Clean Sustainable Energy Authority,

I am writing on behalf of the City of Williston to express our robust support for the May 2023 Application for Clean Sustainable Energy Authority submitted by Wellspring Hydro for their Chlor Alkali and Lithium mining project.

As a city that thrives on the energy sector, we understand the crucial importance of innovation, sustainability, and diversification for the longevity and prosperity of our regional economy. We firmly believe that Wellspring Hydro's project will be a cornerstone in this context, providing a sustainable and cost-effective solution that is crucial for the continuation of traditional oil and gas operations.

Wellspring Hydro's pioneering approach to Chlor Alkali and Lithium mining promises not only to secure a dependable supply of hydrochloric acid, which is fundamental for well completion, but also to ensure a consistent provision of caustic soda, which has wide-ranging industrial applications. By driving down the costs of these key resources, the project could significantly enhance operational efficiency and cost-effectiveness within our industry.

Furthermore, the emphasis on Lithium mining echoes the global shift towards clean energy. As Lithium is a key component in the production of batteries for electric vehicles and renewable energy storage systems, the project's potential to strengthen the domestic Lithium supply chain aligns with our aim to diversify and fortify our regional economy, while reducing dependence on foreign resources.

www.cityofwilliston.com
T. 701-713-3800
F. 701-577-8880
22 East Broadway
Mailing Address: PO Box 1306 Williston, ND 58802

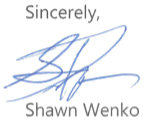
Letter of Support – City of Williston 2

May 17, 2023
Page Two

The City of Williston is therefore proud to endorse Wellspring Hydro's Chlor Alkali and Lithium mining project. We are convinced that their innovative approach, coupled with their commitment to sustainability and economic diversification, will make a lasting and positive impact on our region and the broader energy industry. We strongly recommend that the Clean Sustainable Energy Authority approve their May 2023 application and extend the necessary support for this transformative project.

Thank you for considering our recommendation. Please do not hesitate to contact us if you need any further information or clarification.

Sincerely,



Shawn Wenko
Interim City Administrator

www.cityofwilliston.com
T. 701-713-3800
F. 701-577-8880
22 East Broadway
Mailing Address: PO Box 1306 Williston, ND 58802

Letter of Support – UND

DocuSign Envelope ID: E6A3E28F-EAD8-43FA-8DB4-01869E5384A3

UNIVERSITY OF NORTH DAKOTA

UND.edu

COLLEGE OF ENGINEERING & MINES

Office of the Dean
Upson II, Room 165
243 Centennial Dr Stop 8155
Grand Forks, ND 58202-8155
Phone: 701.777.3411
Fax: 701.777.4838
Website: engineering.UND.edu

May 19th, 2023

To Whom it May Concern

Re: Letter of Support for Wellspring Hydro to the Clean Sustainable Energy Authority

This letter provides support for Wellspring Hydro's continued effort to build a chlor-alkali plant in North Dakota that will convert produced water from the Bakken into commodity chemicals with high market potential in North Dakota and the surrounding region. The proposed plant provides an excellent alternative to disposing of the produced waters while simultaneously producing feedstock chemicals that can be used to support the continued development of the oil industry in the state. The electric power industry and the transportation sector also represent significant market opportunities. We have explored several treatment options for produced water, including the chlor-alkali option. As a subcontractor in the preliminary work done in conjunction with Barr Engineering, we performed a variety of bench-scale tests and modeling efforts to help determine both the technical and economic viability of the approach proposed by Wellspring. Through this team effort, a process scheme was developed that used proven technology to produce caustic soda and hydrochloric acid as the primary products, taking advantage of the high sodium chloride level in the Bakken brines. The results of the feasibility study performed under the Barr Engineering contract have demonstrated the technology represents a good investment opportunity.

We applaud Wellspring Hydro for their pending completion of the FEL-3 study that now provides the detailed information needed by Wellspring to raise the capital required to build the plant. The plant will provide a lower-cost option for dealing with the produced water than the current disposal methods, with the added advantage of improved public perception availed by reducing the amount of deep-well injection required. The HCl can be used locally, and likely be made available to the industry at a price lower than that currently paid as Wellspring will avoid the premiums attached to the current supply due to trainload, rail, and distribution fees from the current suppliers. The recovered salts also provide opportunities for additional product development, such as caustic soda to be used in carbon capture at our critical coal fired power plants, calcium chloride for dust control, and lithium recovery to be used in battery production.

I am happy to provide my endorsement to their business plan as it represents a good opportunity for the State of North Dakota and a good investment opportunity.

Sincerely,

DocuSigned by:
Daniel Laudal
9CFF8579D0B6464

Daniel Laudal, Ph.D.
Executive Director
College of Engineering & Mines Research Institute
University of North Dakota
daniel.laudal@und.edu

The University of North Dakota is an equal opportunity / affirmative action institute.

Letter of Support – Commerce

NORTH Dakota | Commerce
Be Legendary.

May 19, 2023

Subject: Letter of Support for Wellspring Hydro's Chlor Alkali and Lithium Mining Project

Dear Members of the Clean Sustainable Energy Authority,

I am writing to express the North Dakota Department of Commerce's support for Wellspring Hydro's Chlor Alkali and Lithium mining project in their Application to the Clean Sustainable Energy Authority. Wellspring Hydro has demonstrated an impressive commitment to innovation within a mature industry, paving the way for economic growth and environmental sustainability. By manufacturing traditionally imported products locally, Wellspring Hydro will contribute to the generation of net new revenue for the State of North Dakota. Specifically, the production of Hydrochloric Acid (a key commodity in the oil industry) and Caustic Soda (a critical commodity in carbon capture) will help keep two key parts of the energy industry in North Dakota competitive.

Wellspring Hydro's project encompasses the mining of Lithium from produced water. As the demand for Lithium continues to soar within the renewable energy sector, this aspect of the project uniquely bridges the traditional oil and gas industry with the emerging renewable energy sphere. It presents an extraordinary opportunity for North Dakota to establish its relevance and prominence in the renewable energy landscape.

The North Dakota Department of Commerce fully recognizes the significance and potential impact of Wellspring Hydro's Chlor Alkali and Lithium mining project. We believe that this venture is well aligned with our state's vision for economic diversification, job creation, and sustainable practices. The project addresses supply constraints, contributes to the local economy, and fosters collaboration between different sectors.

Sincerely,

Richard Garman, Director
Economic Development & Finance Division
North Dakota Department of Commerce

1600 E Century Avenue, Suite 6 | P.O. Box 2057 | Bismarck, ND 58502
PHONE: 701-328-5300 | TOLL FREE: 1-866-4DAKOTA | ND RELAY TTY: 1-800-366-6888 | VOICE: 1-800-366-6889 |
NDCommerce.com

Letter of Support – Pivotal

DocuSign Envelope ID: 8F332CCF-D8EB-4B30-9056-3EB761097BE5

Pivotal Energy Partners Inc.
Suite 510, 736 – 6th Avenue SW
Calgary, AB T2P 3T7
Pivotalenergy.ca

May 16, 2023,

Dear Members of the Clean Sustainable Energy Authority,

I am writing to express Pivotal Energy Partners enthusiastic support for the May 2023 Application for Clean Sustainable Energy Authority submitted by Wellspring Hydro for their Chlor Alkali and Lithium mining project in Northwest North Dakota. As an innovative energy company, we recognize the significance of this project and its potential to transform and support both traditional oil and gas operations as well as the clean energy sector.

One of the most compelling aspects of Wellspring Hydro's project is their innovative approach to resource utilization. Pivotal is a trusted midstream company that strategically bridges the logistical and financial gap between our partners and the target marketplace for their products. Through a cooperative, transparent approach, we work with our partners to increase netbacks, lower operating costs, and maximize margins. We strive to provide partnerships that are fueled by an unparalleled level of trust and transparency in all that we do. We have intentionally designed our services to provide a model that is flexible and adds value in a safe and economical manner. Our fully scalable, modular facilities are built to meet capacity demand for our partners. We have aligned with industry-leading technology developers to further optimize our services for our partners.

Pivotal is also dedicated to the highest environmental protection and safety standards throughout all levels of our organization. This level of commitment ensures a workplace that protects the health and safety of our employees, contractors, and the communities in which we operate.

We see Wellspring Hydro as a potential partner for future projects of our own and strongly feel that they fit in with many of our core initiatives. Local manufacturing will create opportunities to increase plant netbacks while lowering local logistics, operating cost in North Dakota remain attractive due to lower energy costs and inexpensive land. The environmental components of Wellspring are game changers as they allow for the beneficial use of a current waste stream and the potential to generate lithium for the renewable energy sector. Water consumption will be significantly lower than current mining operations and near zero when the plant is running optimally.

Pivotal is proud to endorse Wellspring Hydro's Chlor Alkali and Lithium mining project. We believe that their innovative approach and dedication to sustainability, coupled with our collaboration, will make a lasting and positive impact on the energy industry. We strongly encourage the Clean Sustainable Energy Authority to approve their May 2023 application and provide the necessary support for this transformative project.

Thank you for considering our recommendation. Please do not hesitate to contact us if you require any additional information or clarification.

Sincerely,

DocuSigned by:
Chris Boulanger
VERIFIED ACCEPTED

Chris Boulanger, President – Pivotal Energy Partners USA

Letter of Support – OneCor

OneCor SERVICES

May 16, 2023,

Dear Members of the Clean Sustainable Energy Authority,

OneCor Services would like to show our support for the Wellspring Hydro project to build a chlor alkali facility in Northwest North Dakota. The need for local industrial commodity chemicals manufactured in a sustainable manner that cuts down significantly on logistical cost will help continue the extensive development of the Williston Basin.

At OneCor Service we are a Williston, ND based company with offices in Watford City, ND, Odessa, TX, and San Antonio, TX. We pride ourselves as community members who are a premium provider of several crucial services that support the oil and gas industry. Including Hydrochloric acid supply, logistics, and custom blending, Geoprobe Drilling, Environmental services, Weed Control and Pressure pumping.

A challenging and oftentimes limiting factor that all services companies experience in the Williston Basin are limited availability of products and significantly higher logistical costs when compared with other basins that we operate in. This has a trickle-down effect that touches every component of the drilling, completions and production life cycle in the oil and gas production. Hydrochloric acid typically must go through several other companies to arrive in basin at which point the end uses sees a premium to their P&L. Innovations which Wellspring Hydro are working towards will allow ND operators to achieve reduced operating costs due to lower priced in basin logistics.

There are also many ways OneCor sees Wellspring Hydro impacting our local economy by bringing in up to 55 high paying jobs, 80M in annual revenue as an exporter of low carbon chemicals manufacturing. This all leads to greater recognition on a global scale for the innovation we see every day in North Dakota.

In summary, we at OneCor strongly support Wellspring Hydro and their goal of utilizing Williston Basin waste salt water to supply an innovative chlor alkali facility and extract lithium.

Thank you for considering our recommendation. Please do not hesitate to contact us if you require any additional information or clarification.

Sincerely,

Tom Bachmeier

Chief Executive Officer

Letter of Support – Cerilon

CERILON

NDV-2010-LTR-0001
2023-MAY-18

Clean Sustainable Energy Authority
14033 - 49 Street NW
Williston, ND, 58801

Dear Members of the Clean Sustainable Energy Authority,

I am writing to express Cerilon Inc.'s support for Wellspring Hydro's innovative Chlor Alkali and Lithium Mining Project. As a company deeply embedded in the energy sector, we understand the pressing need for sustainable practices, and believe in the potential of their project.

At Cerilon, we support the numerous benefits that Wellspring Hydro's project offers, specifically the production of caustic soda, an important chemical in our operations. By securing a stable and cost-effective supply of this chemical, the Cerilon GTL project will enhance production efficiency and drive down operational costs. The Wellspring Hyrdo's Project aligns with our commitment to sustainably obtain essential production materials in an environmentally conscious manner.

By endorsing this project, we align ourselves with Wellspring Hydro's vision for a diversified, robust, and sustainable regional economy. We urge the Clean Sustainable Energy Authority to recognize the potential of this project and provide it with the necessary support and approval.

Sincerely,

Nico Duursema
Chief Executive Officer

CERILON INC.
First Canadian Centre
350 - 7 Avenue SW, Suite 2900
Calgary, Alberta, Canada T2P 3N9

+1.403.264.8044
Info@cerilon.com
Cerilon.com

Letter of Support – Grayson Mill

GRAYSON MILL
ENERGY

May 15, 2023,

To Whom It May Concern,

Grayson Mill Energy LLC(GME) supports the efforts of Wellspring Hydro (WSH) to build a produced water recycling facility in Northwestern North Dakota that is focused on the concentration of produced water through crystallization and subsequent extraction of high value minerals including sodium chloride (NaCl) and Lithium (LiCl). We believe that Wellspring Hydro's alternate extraction process is crucial for North Dakota's continued position as a global market leader in oil and gas production while adding in the environmental benefits of water recycle, alternate reuse and renewable feedstock development. A project like Wellspring Hydro will help lead the way in North Dakota's advancing economy of carbon capture and storage, commodities manufacturing, and rare earth element security for the United States.

Grayson Mill is a leading North Dakota oil and gas producer with nearly 300,000 acres and 90,000 BOE/day production in 2023. Our core mission is to stay committed to generating value through disciplined acquisitions of oil and gas assets and improving cash flow and net asset value. GME's returns-focused strategy aims to acquire the best rock, operate as efficiently as possible and drill industry-leading wells. The company's strategic objectives target a return on capital to its investors through positive cash flow and net asset value growth in a safe and reliable manner. Every one of GME's employees are aligned to accomplish this through enhanced base production levels, reduction of costs, and the pursuit of production growth through efficient and safe operations all while striving to embody our core values of humility, integrity, passion, accountability, and collaboration.

To highlight our support for Wellspring Hydro, we see value in the ability to look differently at our assets and work with a company like WSH to make environmental stewardship a focus while not abandoning our strategic objectives. WSH's work not only enhances the environmental footprint of the area but also offers real fiscal opportunity for GME through reduction of disposal well costs & injection pressures, lessening of produced water trucking, utilization of excess natural gas in basin (both for co-Gen and to supply directly to WSH for operations) and the execution of supply agreements in return for valuable products such as Hydrochloric Acid and Calcium Chloride routinely utilized in fracturing and production enhancement of our base assets.

To further underscore our support of Wellspring Hydro, Grayson Mill Energy is currently exploring commercial agreements and reviewing land options. It is our strong belief that North Dakota's ongoing support of projects such as Wellspring Hydro are what continue to make it a place to invest and grow our already significant market position.

Please reach out to me with any questions or clarification requests regarding the above comments.

Sincerely,

Blake Sullens, Chief Operating Officer

840 W. Sam Houston Pkwy. N.| Suite 300| Houston, TX 77024

Lithium MOU

Wellspring has executed a Memorandum of Understanding ("MOU") with a Lithium partner to evaluate, trial and execute the lithium extraction process. For purposes of confidentiality, Wellspring Hydro can provide additional details and the MOU contract upon request.

Wellspring is the original developer of a pre-construction produced water pretreatment facility, saltwater disposal, salt crystallization plant, and chlor-alkali facility in Western North Dakota. The lithium partner will be the developer of a to-be-built Direct Lithium Extraction system capable of but not limited to lithium extraction from minimally treated "produced water" streams and concentrated "Mother Liquor" streams generated by Wellspring Hydro.

The lithium partner will provide DLE process equipment and testing to Wellspring upon the completion of Bench and Pilot testing, as outlined in this application.

Engagement Letter – Department of Environmental Quality

NORTH Dakota | Environmental Quality
Be Legendary.™

September 25, 2023

Reice Haase
Clean Sustainable Energy Authority
State Capitol 14th Floor
600 E. Boulevard. Dept. 405
Bismarck, ND 58505-0840

Re: NDDEQ Meeting with Wellspring Hydro

Dear Mr. Haase:

The North Dakota Department of Environmental Quality (NDDEQ) held an early engagement informational meeting with Mat Hirst, Chief Operating Officer for Wellspring Hydro on September 13, 2023. NDDEQ representation in the meeting included the Division of Water Quality, Division of Air Quality, and Division of Waste Management. The meeting regarded the potential Wellspring Hydro project to be located near Trenton, North Dakota.

Based on the preliminary information discussed during this meeting, NDDEQ representation believes Wellspring Hydro is eligible to apply for the approvals necessary to construct and operate the proposed facility (e.g., an air quality Permit to Construct pursuant to Chapter 23.1-06 of the North Dakota Century Code and the Air Pollution Control Rules of the State of North Dakota (Article 33.1-15 of the North Dakota Administrative Code)).

The eligibility to apply for the necessary approvals should not be construed as a guarantee that the required approval will be issued, this determination is made during NDDEQ's application processing. That said, based on the information shared in the meeting, NDDEQ believes the Wellspring Hydro project could comply with all applicable state and federal environmental regulations.

Should you have any questions, concerns, or comments for NDDEQ, please reach out to David Stroh at (701)328-5229 or destroh@nd.gov.

Sincerely,

Karl Rockeman, P.E.	Chuck Hyatt	David Stroh
Director	Director	Environmental Engineer
Division of Water Quality	Division of Waste Management	Division of Air Quality

DES:lc

xc: L. David Glatt, Environmental Quality, Director
James L. Semerad, Division of Air Quality, Director
Mat Hirst, Wellspring Hydro, Chief Operating Officer

4201 Normandy Street | Bismarck ND 58503-1324 | Fax 701-328-5200 | deq.nd.gov

Director's Office	Division of Air Quality	Division of Municipal Facilities	Division of Waste Management	Division of Water Quality	Division of Chemistry
701-328-5150	701-328-5188	701-328-5211	701-328-5166	701-328-5210	701-328-6140 2635 East Main Ave Bismarck ND 58501

Engagement Letter – BARR Engineering

resourceful. naturally.
engineering and environmental consultants

BARR

September 11, 2023

Mat Hirst
Chief Operating Officer
Wellspring Hydro

Sent via email to mat@wellspringhydro.com

Re: Proposal for Pre-Permitting Engagement and Environmental Compliance Strategy Support for the Proposed Chlor-Alkali Facility

Dear Mat:

On behalf of Barr Engineering Co. (Barr), I am pleased to submit this proposal for professional consulting services to Wellspring Hydro regarding the proposed chlor-alkali facility to be located near Trenton, North Dakota. This proposal is in response to your September 7, 2023, email request and follow-up call with Amanda Gravseth.

Understanding of the Project

Wellspring Hydro and its partners are evaluating the construction and operation of a greenfield chlor-alkali facility near Trenton, ND. Barr's role during this initial phase shall be to provide multi-media pre-permitting engagement and related strategic environmental consulting services as directed by you.

This authorization request is for the following pre-permitting engagement activities over the next four months (approx.) in support of this role:

1. Provide pre-permitting engagement and correspondence to Wellspring Hydro for interaction with investors and engineers as the proposed project progresses.
2. Participate in project meetings with investors, engineers, agencies, as requested by you. Barr will provide input and follow-up activities from environmental/permitting items that arise during these meetings.

Subsequent permitting work as the facility engineering design progresses will be covered under a separate or amended authorization request.

Scope of Work

Barr's scope of work activities and corresponding cost estimate on a time-and-materials basis is described below for the two tasks.

Task 1: Pre-permitting engagement and correspondence. [$3,000] – 15 staff hours

The primary objective of this task is to leverage our experience and expertise in environmental permitting for industrial facilities in North Dakota, led primarily by staff in our Bismarck office. We will provide guidance to you as you continue to engage with potential investors and engineering teams as the project progresses.

Task 2: Participate in project meetings. [$2,000] – 10 staff hours

This task provides an estimated 10 staff hours for Barr to participate in meetings with you to provide input and nominal follow-up activities related to permitting and environmental compliance of the proposed project during this work authorization.

Service Assumptions and Compensation

The budgetary cost on a time-and-materials basis is $5,000. The project will be billed on a time-and-materials basis in accordance with the Barr fee schedule that is in effect at the time the work is performed. Invoices will be provided on a four-week basis. Payment terms are net 30 days. Should the project take less time than what is assumed, Barr will only bill for hours worked. Conversely, if certain subtasks require more time than identified in this proposal, Barr shall communicate any needed revisions to the scope of work prior to exceeding this budget.

Schedule

We will begin work immediately upon your authorization. The project cost estimate assumes a four-month work duration.

Project Team

Amanda Gravseth and I will be your key points of contact. If necessary, other Barr team members will be leveraged for support and expertise.

Thank you for the opportunity to provide Wellspring Hydro with this proposal. If you would like to discuss this proposal in further detail, please contact Amanda Gravseth (agravseth@barr.com, 701.221.5424) or me (adriscoll@barr.com, 952.832.2791).

Sincerely,

Adam Driscoll
Vice President

cc: Mark Watson, Wellspring Hydro
Amanda Gravseth, Barr

Hargrove Detailed Design Proposal – Wellspring Hydro

Attached as a separate document in the CSEA submission due to size.

Response to Request for Proposal

Chlor-Alkali 150 STPD Greenfield Plant

Detail Design

Trenton, North Dakota

Submitted to

Wellspring Hydro

Attn: Mr. Mark Watson

mark@wellspringhydro.com

Hargrove Ref. No. HRBH213095 Rev. 0

Submittal Date: October 26, 2023

October 6, 2023

Subject: Chlor-Alkali 150 MPD CL_2 Greenfield Plant
Hargrove Reference No.: HRBH234040

Dear Mark,

Hargrove and Associates, Inc. (Hargrove) is pleased to present this proposal to provide engineering services for the Chlor-Alkali 150 STPD CL_2 Greenfield Plant Detail Design at a plant location to be determined later. We are confident that our knowledge and demonstrated success with similar projects, experience working with Wellspring Hydro, and overall alignment with your needs and priorities,

Why Hargrove?

- **Safety First** – Like Wellspring Hydro, Hargrove is committed to doing whatever it required for all who are touched by our work to go home safely every day. We are committed to an incident-free project execution. Our commitment starts on the first day of project design and continues through the end of startup with a focus on safety in design, planning, constructability, and operational safety once the project is completed and turned over. Our Team's safety statistics, awards, and Teammates' attitudes in support of safety leadership prove our commitment.
- **Understanding of Wellspring Hydro's Needs** – Hargrove has proven capabilities of performing all facets of needed services, starting with project FEL Engineering services through Execution, including EPC capabilities. These capabilities have been demonstrated on a continuous basis. Hargrove will work very closely with WELLSPRING HYDRO's project team to align on all project objectives, priorities, and execution plan. Any change will be reviewed with WELLSPRING HYDRO as soon as it is identified.
- **Right Size Company and Team** – We continuously focus on having the right people, in the right place, at the right time. Our Hargrove Teammates working on WELLSPRING HYDRO projects have significant experience, both in and out of the field and employ a "One Team" approach ensuring a well-executed project. We understand your expectations and expect no surprises as the project advances.
- **Value Creation** – Hargrove is committed to creating value for Well Spring Hydro, by partnering with entire project teams to identify scope optimization and FEL opportunities which reduce overall project TIC and schedule. We are a relationship-based company and work as an integrated team to drive value with our clients. From our experience with projects and portfolio alliances, we know that strong communication and practicing collaborative teamwork are pillars in delivering value to Wellspring Hydro.

We hope you find our proposal responsive to your request and look forward to meeting with you to review and ensure that our response is in complete alignment with your expectations.

Please contact or our me if you should you have any comments or questions regarding our proposal. We look forward to a successful, collaborative project working closely with your Team.

Regards,

J. Scott Cooper | Director- Chlor-Alkali
Hargrove and Associates, Inc. | Birmingham, AL
p: 205.484.0241| c: 205.901.7887

www.hargrove-epc.com

1.0 Project Understanding

As part of the Detail Design of the project, Hargrove will perform the following activities:

- Define infrastructure requirements to facilitate the expansion
- Define equipment scope required
- Assist Wellspring Hydro with identification of long-lead equipment and materials to be prioritized due to the current global supply-chain situation
- Develop a priced equipment list containing the process/electrical equipment needed to support the plant requirements
- Develop IFP Quality Equipment Packages for long-lead equipment items for Wellspring Hydro to purchase

2.0 Execution Plan

The project will begin with a kickoff meeting to align Wellspring Hydro and the Hargrove project Team on the project expectations, deliverables, and overall project schedule. An engineering milestone schedule will be developed and issued to Wellspring Hydro early in the project. Throughout the project Hargrove will hold weekly Team meetings and provide weekly reports, which will include completed and upcoming tasks, project needs or concerns, as well as man-hours and cost spent to date.

2.1 Project Kickoff

The project will be led from our Birmingham, Alabama office, as it is the home office for the majority of our veteran Chlor-Alkali engineering staff. Once the project is awarded, the first critical activity will be to hold the project kickoff meeting to provide an opportunity for alignment of the Wellspring Hydro and Hargrove project teams. We suggest the following as key topics for the kick-off meeting:

1. Complete review of project scope and objectives of the project
2. Identify key contacts and interfaces between WELLSPRING HYDRO/and Hargrove
3. Project Communications
4. Project Controls requirements
5. Schedule development and reporting
6. Project Milestone Dates
    - Kick off Meeting (KOM) – TBD
    - IAP (Interactive Planning Session) – 1 week after KOM- Birmingham Offices
    - Additional Dates will be established and agreed to during IAP
7. Project deliverables (both Wellspring Hydro and Hargrove)
8. Document Control Review including Document Distribution Matrix Development
9. Change Management
10. Discuss Wellspring Hydro project funding and cash flow requirements
11. Meetings and Weekly / Monthly Reports
12. Discuss project responsibility matrix

2.2 Interactive Planning and Schedule Development

Within days of the Kick-Off meeting, the Hargrove Team will schedule a team (Hargrove & WELLSPRING HYDRO) Interactive Planning (IAP) session considering the Project Milestone Dates reviewed in the project Kickoff meeting. The Hargrove Team will use the results of this IAP to develop a preliminary schedule of detail design activities. The goal will be to first identify key milestone dates followed by the development of discipline activities needed to achieve the milestone dates according to each of the work areas. The development and review cycles of the TIC Estimate will be included along with the re-bidding activities associated with Detailed Design and the associated estimated durations.

2.3 Project Controls

Scheduling

Upon completion of the IAP described above, our scheduling Team will develop a resource loaded schedule using the latest version of Primavera. Schedule development begins with a detailed scope of work and defined Work Break Schedule (WBS). From this the lead engineers develop their engineering packages that support the project construction plan. All the engineering packages are loaded in the Hargrove Progress Tracking Tool (PTT). We use the PTT to track engineering based on the earned man hour method. We also track productivity using the PTT.

Schedules will be updated on a weekly basis. The critical path is reviewed as required to determine bottlenecks and work around plans. Milestones can also be included for decisions needed for risk register items.

Our Project Controls Team will develop and maintain a resource loaded critical path schedule in accordance with Hargrove standard procedures and incorporate client guidelines and expectations. The proposed schedule (see Appendix B) was developed to help our Team map out the Detailed Design durations for the project. This schedule will be further refined via a focused schedule interactive session at the start of the project and will be reviewed and communicated weekly or as major milestones change to reflect actual completed activities and incorporate input from our design Team and vendors alike as the project progresses.

Earned Value and Progress Reporting

An earned value analysis will be performed each time progress is reported. Productivity (earned workhours / actual workhours) is tracked to assess the work hours required to complete the project.

2.4 Constructability Analysis and Review

During detail design, Hargrove will facilitate constructability review meeting with the constructor as agreed to upon engagement with the constructor.

2.5 High Value Engineering Partner

Hargrove maintains a partnership with a High Value Engineering Center locations in Caracas, Venezuela and / or Monterrey, Mexico. Hargrove understands that High Value Engineering (HVE) fits the project's best interests and will include an HVE delivery strategy in the overall project execution plan. In our experience, Electrical, Instrumentation, Piping, and Civil/Structural are well suited for HVE project execution. We are accustomed to working within horizontal or vertical split scope and typically determine the best approach based on project type, scope, and level of integration with an operating facility.

Hargrove's philosophy of project execution utilizing HVE partners is designed to create a successful project team that is seamless and transparent to the Owner. Hargrove will maintain the role of leader and facilitator for the HVE team and maintain full responsibility for 100% of the designated HVE project scope. The Hargrove / HVE team applies the same practices and procedures to ensure quality, consistency, and execution in the most efficient manner possible. Documents and drawings developed by HVE Teammates are regularly reviewed and approved by the corresponding Hargrove Professional Engineer providing Responsible Charge for each discipline. Value engineering will be a focus for the engineering and design Team to ensure our collective Team is identifying and seeking ways to optimize project scope, schedule, and cost.

2.6 Model Reviews

Three reviews (30%, 60% and 90%) will take place during the Detailed Design phase. These reviews will be conducted at our Birmingham office with attendance of key Hargrove personnel. Other contributing parties will attend "virtually" via Microsoft Teams, as necessary. Hargrove will submit in-progress design documents for review in advance of the model reviews. Hargrove's Discipline Leads will also be available to review directly with WELLSPRING HYDRO's Team. These reviews will allow the WELLSPRING HYDRO Team (i.e., operations, maintenance, construction, etc.) an opportunity to review and provide feedback early in the design development process so that their concerns and recommendations are addressed efficiently and without significant cost impact. Hargrove's key leads will be present for the model reviews and actions will be documented and confirmed in future reviews.

2.7 Change Management

If there is a scope deviation, this will trigger the Hargrove Change Management procedure. Requested changes to scope or schedule cannot be implemented, or work progressed, until they are defined and approved by Wellspring Hydro. Further, change must be defined and presented to the WELLSPRING HYDRO project management Team immediately upon identification in the form of a Rough Order of Magnitude (ROM) Change Notice. Once the ROM is approved, a firm Project Change Notice can be developed. Hargrove will openly review potential changes in weekly coordination meetings. In keeping with our procedures, change will be presented for WELLSPRING HYDRO consideration within two (2) days of identification. The Hargrove project controls Team will assist in preparation of the engineering cost and schedule impacts as well as the estimated overall TIC cost and schedule impacts related to each scope change, upon receipt of approval from WELLSPRING HYDRO to implement the change. However, the Hargrove Team, first and foremost, will evaluate each change and seek ways to negate the change or assess the effectiveness of the change as well as determine the overall project impact of the requested change (cost and schedule). If the scope change is not deemed necessary, the Hargrove Team will present our findings to the WELLSPRING HYDRO Team and mutually agreed upon decision to either proceed or cancel the need for the said change.

2.8 Document Control

Hargrove utilizes Newforma Project Center for project management and document control needs. The program was created by engineers and is geared towards the work processes that we use every day. Below are some of the ways that we use Newforma to efficiently send and track information.

Document Transmittals - Our transmittals are sent via the Newforma Info Exchange. This method allows us to transmit very large amounts of information without being limited by the size of the outgoing or incoming email box. An email is sent to the recipients with a link to our secure server (Only those listed on the transmittal can access the information.) The recipient can then download all or partial contents of the transmittal. For Approval

transmittals, the system allows the client team member to reply back directly through the Newforma Info Exchange website, attaching any files with markups.

Submittals - The vendors will also utilize the Newforma Info Exchange Website to send any documents for review and/or approval. The documents are logged in and tracked throughout the entire review process then transmitted back to the vendor with any comments.

Action Items - The action item process allows us to send action items to both Hargrove and Client team members using the Newforma system. This allows the project manager to easily track all action items.

RFIs (Construction Phase Only) – The outside team member (Construction Manager, etc.) can send RFIs through the Newforma Info Exchange website directly to the Hargrove Project Manager who in turn assigns the request to the proper internal team member to answer. The system allows for a very quick turnaround on the RFIs and provides a means for establishing a record of all requests and answers.

Additionally, Hargrove has incorporated the use of Bluebeam into the document control system to create a session to allow all reviewers or approvers to collaboratively view or work on a project document at the same time. Bluebeam sessions can be set up with either no closure date or a specified due date to suit the project needs.

The Newforma Project Management Information system has proven to be efficient, effective, and easy to use for the Hargrove and Client Team.

3.0 Scope of Work

The following activities are included in the Hargrove scope of supply as per this proposal:

3.1 General/Project Services

The Hargrove Team will engage a Project Manager, Project Engineer, Project Controls (Cost and Schedule), Procurement and Expediting, Project Administration and Project Document Control resources to ensure that weekly project progress reporting is provided in a timely manner to WELLSPRING HYDRO's Project Manager. The Hargrove Project Manager will issue a weekly status report and will conduct a weekly virtual coordination meeting to help resolve project needs/issues and reach decision on open items to ensure timely resolution to support the project schedule objectives. Procurement Status Reports and Expediting Status Reports will be issued periodically during Detailed Design to provide vendor data status for all equipment.

3.2 Process

Heat & Material Balance - A heat and material balance will be developed to coordinate with the required production rate and any future increases. Once the H&MB is complete, PFDs with stream tables will be developed and will finalize the project process production considerations.

P&IDs - The Hargrove Process Team will lead the P&ID development effort. Process will perform continuity checks on the P&IDs as they are developed and evolve into Issued for design (IFD) level documents. Process will conduct P&ID review meetings prior to each P&ID release. The P&IDs will be issued by Area to best facilitate construction and start-up aspects. During the Detailed Design phase, Process will continue to facilitate the effort to progress the P&IDs to IFD status.

Equipment Packages - The Process Team will be responsible for process equipment packages development. The Process Team will develop IFP quality equipment packages for long-lead equipment items early in the detail design

phase (20 packages). A detailed breakdown of equipment packages being handled by the Process and Mechanical groups along with the planned development progress of Detailed Design can be found in the deliverables section.

IFQ Packages - The Process team will begin by developing IFQ packages for the long lead equipment. The Process Engineering Team will work closely with the Mechanical Engineering Team and Wellspring Hydro to ensure the packages contain all the pertinent information necessary to fully define the equipment packages including process data, materials of construction, client standards, industry standards, required vendor submittals, etc. The packages will be submitted to Wellspring Hydro for review and approval. Any comments received will be incorporated prior to issuing to the Wellspring Hydro preferred vendor(s) for bid. Once all bids are received, the Process Engineering Team will review each bid for technical compliance. The Process Engineering Team will also coordinate with Procurement and provide the support needed for the commercial bid tabulations being created and issued to Wellspring Hydro. These findings will be summarized on a bid tab form for each equipment package and issued for information to Wellspring Hydro. Once a technically acceptable bidder is selected and agreed upon, the Process Engineering Team will develop a purchase requisition package (IFP) to be issued to Wellspring Hydro so that purchase order can be submitted to the successful bidder. Balance of equipment will be handled in a similar manner and will be prioritized to support the construction installation schedule.

Vendor Data - Hargrove's Process Engineering Team will facilitate a kickoff meeting with each selected vendor to confirm drawing schedule deliverable, set clear expectations for vendors, and gain alignment on the vendor data submittal and review process. Once vendor data is received, the Process Team, along with other Hargrove disciplines and Wellspring Hydro, will review the vendor data and make comments as necessary. This will continue until vendor drawings are reviewed without comment, which should take no longer than the third pass review. Hargrove's Document Control Coordinator will work closely with the Project Team to ensure all vendor data is received and submitted per the agreed upon terms included in the IFP IFQ.

Mechanical Equipment List - The Process and Mechanical Teams will collaborate and maintain the mechanical equipment list. This list will be updated throughout the project to serve as a concentrated reference for all pieces of mechanical equipment. At project completion, the equipment list will be issued for construction. The mechanical equipment list will be submitted intermittently during the project.

Instrument Datasheets and PSVs - Additionally, the Process Team will coordinate with the instrumentation Team to provide the process data for the inline instrument datasheets to allow progression of those packages during detail design. Process will support the development of the instrument datasheets for the non-inline devices at the start of detailed design. In parallel, preliminary PSV calculations will commence utilizing Hargrove's Relief System Checklist, revision 1, for the approximately 30 unique new relief valves identified on the project. At the start of detail design, the PSV packages will be updated with Wellspring Hydro approval comments and broken into PSV packages prior to submittal to Wellspring Hydro's preferred vendor for bid. Upon receipt of bids, Process will review and confirm technical acceptance prior to issuing the RFQ to WELLSPRING HYDRO for Procurement. Dispersion modeling will be performed on the PSVs to verify the discharge is routed to a safe location after the piping is routed but prior to stress calculations are performed to prevent rework. The Issued for Construction PSV packages will be issued following the piping construction package issuance.

The Process Team will remain engaged, as necessary, to support the entire project Team for the duration of the Detailed Design phase to provide any remaining process data needs, perform vendor document reviews, and participate in the PHA facilitated by WELLSPRING HYDRO. Any changes resulting from the PHA will be redlined on the P&IDs and issued to the project Team to ensure discipline scope alignment. Process will coordinate with the Piping Design Team to ensure all PHA comments are accurately incorporated prior to issuing for design.

3.3 Architectural

Hargrove's Architectural Team will begin by establishing the design basis. Once the design basis is confirmed the Team will work with Civil and Piping teams to begin progressing the site prep package for Code separation distance requirements between structures and property boundaries. The Team will work with other Hargrove teammates to develop a comprehensive 3D model for issuing Wellspring Hydro approval.

Architectural team will develop a basis of design package that describes the minimum building footprint size and interior space requirements for each process and occupied site structures, so a design build firm could provide the final layout design and code review summaries.

3.4 Civil/Structural

Hargrove's Civil/Structural Team will begin by establishing the design basis and issuing a Design Criteria Document. This will include a review by the EOR of the geotechnical information (provided by Wellspring Hydro) to confirm its adequacy for the project needs. Once the design basis is confirmed the Team will begin progressing the site prep package.

The Civil/Structural Design Team will work with Piping to build a comprehensive 3D model. The Team will utilize this 3D model to incorporate all design development. Additionally, the Civil/Structural Team will support the planned 15% model review where area site work plans will be reviewed prior to the package issuing for Wellspring Hydro approval.

Hargrove's Civil/Structural Team commence Detail Design work fronts to support planned construction priority efforts. Therefore, the Team will work closely with Piping Engineering to confirm loads as soon as available. Additionally, equipment vendor data will be needed for all critical equipment at the start of Detail Design and will be assumed adequate to progress engineering and design of all piles and foundations. As necessary and as described in this proposal, the Hargrove Structural Engineer will perform structural assessments of structures to support loads from new additions. Multiple construction work packages are planned to issue during Detail Design for the Civil/Structural Team:

- Site Work
- Pile Package
- Major Foundation Package (pile caps & critical equipment foundations)
- Area Paving & Minor Foundation Package (pump foundations, etc.)
- Concrete Protective Coatings
- Major Structural Steel Package
- Minor Structural Steel Package (MPS / MES)

A construction scope of work document will be developed and submitted with each package. The planned project model reviews will contain Civil/Structural scope for review.

Where necessary and as described in this proposal, the Hargrove structural engineer will perform structural assessments to confirm adequacy to support loads. Scope of work documents will be issued for entire scope, except for the Site prep package which will be take to IFC during as an early release.

3.1 Mechanical

Hargrove's Mechanical team will be responsible for a total of 14 equipment packages, the equipment items contained in the equipment list provided as part of this proposal. Mechanical will perform sizing calculations to support development of IFD quality equipment datasheets to be used to obtain firm pricing.

During Detailed Design, the Mechanical team will begin by developing IFQ packages for the equipment. The Mechanical Engineering Team will work closely with the Process Engineering Team and Wellspring Hydro to ensure the packages contain all the pertinent information necessary to fully define the equipment packages including process data, materials of construction, client standards, industry standards, required vendor submittals, etc. The packages will be submitted to Wellspring Hydro for review and approval. Any comments received will be incorporated prior to issuing to the Wellspring Hydro preferred vendor(s) for bid. Once all bids are received, the Mechanical Engineering Team will review to determine if each bid is technically acceptable or not. The Mechanical Engineering Team will also coordinate with Procurement and provide the support needed for the commercial bid tabulations being created and issued to Wellspring Hydro. These findings will be summarized on a bid tab form for each equipment package and issued for information to WELLSPRING HYDRO. Once a technically acceptable bidder is selected and agreed upon, the Process Engineering Team will develop a purchase requisition package (IFP) to be issued to Wellspring Hydro for inclusion with the Purchase Order.

Hargrove's Mechanical Engineering Team will facilitate a kickoff meeting with each selected vendor to confirm drawing schedule deliverable, set clear expectations for vendors, and gain alignment on the vendor data submittal and review process. Once vendor data is received, the Mechanical Team, along with other Hargrove disciplines and WELLSPRING HYDRO, will review the vendor data and make comments as necessary. This will continue until vendor drawings are reviewed without comment, which should take no longer than the third pass review. Hargrove's Document Control Coordinator will work closely with the Project Team to ensure all vendor data is received and submitted per the agreed upon terms included in the IFP IFQ.

The Mechanical and Process Team will collaborate to utilize and maintain the mechanical equipment list. This list will be updated throughout the project to serve as a concentrated reference for all pieces of mechanical equipment. At project completion, the equipment list will be issued for construction.

3.2 Piping

Hargrove's Piping Team will coordinate with Process and Wellspring Hydro to review and finalize process requirements to develop the piping service index. The Piping Team will coordinate with Process and Mechanical to develop a line list to align with the P&IDs as well as populate with process conditions to develop the list to an "Issued for Design" status. In conjunction, Piping will coordinate closely with Process to update and maintain the P&IDs capturing any updates as required following the hydraulic studies and PHA.

3D modeling activities will commence soon after the project kick-off and following confirmation piping service requirements. A master 3D model will be created. This model will be used to facilitate the constructability meeting/model review as well as ensure pipe rack space is properly accounted for and pipe routing overlap is eliminated. Equipment modeled will be validated following the receipt of Wellspring Hydro's approval comments to the mechanical and process mechanical IFQ packages and receipt of vendor bids. The Team will focus on modeling all large bore piping (3" and above) with 2" & below to be field routed by the constructor.

Hargrove's Piping Engineering Team will coordinate closely with the Piping Design Team to support the development of the line list, including the identification of lines requiring computational stress analysis, valve list, and specialty item list, as required. Concurrently, the Piping Engineering Team will begin reviewing the modeled pipe routings and will identify modifications needed to the piping design. The necessary modifications will be communicated to the piping design group as required to ensure piping layouts pursuant to ASME B31.3 piping code and Hargrove standards. The Piping Design and Engineering Teams will work closely to ensure all piping is designed

properly and safely. Hargrove's Piping Engineering Team will also support the Civil/Structural design effort by providing reaction loads, determined during pipe stress analysis in Detailed Design. During Detailed Design, Piping Engineering will also develop and maintain an engineered supports list (per Hargrove Procedures, Structural Group maintains engineered support list with input from Electrical and Piping). If during pipe stress analysis it is determined that engineered supports are required to properly support a piping system, Piping Engineering / Design will coordinate with the Structural Engineering to design the appropriate support needed and capture it on the engineered supports list. The Piping Engineering Team will support development of the specialty items list by selecting the appropriate specialty items for each service, getting vendor cutsheets of each item, and updating the description of each item on the list.

The Piping Team will also develop a plot plan of the entire site which includes a general arrangement of equipment, create 3D models of equipment when vendor models are not provided, and review/comment on vendor supplied drawings.

As the project progresses the Detail Design, immediately following the "Issued for Design" control documents, the Piping Team will begin progressing the 3D model in preparation of a 30% model review. This model review will focus on the major pipe routings, as modified from the previous review, any additional lines added, piping identified as long lead MOC, constructability, laydown, safety shower, and utility station locations. This model review is critical in obtaining Wellspring Hydro's approval. As the phase progresses the Piping Design Team will work closely with all disciplines to ensure an integrated 3D model is being maintained and to verify that control documents are being managed and updated through the master-mark up procedure. A 60% model review is planned to review the overall scope in more detail, specifically the lines from start to finish, except for high and low point vent/drains. This model review will be more detailed and will benefit from the attendance of Wellspring Hydro's key project stake holders. The planned 90% model review will serve as piping's issued for approval package and will be facilitated following the completion of single discipline check and incorporation of computational stress analysis. The comments received during the model review will serve as WELLSPRING HYDRO's approval comments and will be documented as such with a project note itemizing each line reviewed and any associated comments captured. Following this review all comments will be incorporated into the package prior to being issued for construction.

3.3 Electrical

The Electrical Team will progress the electric load list as the equipment list is finalized and has identified the required electrical loads and finalize the overall electrical system design by sizing the power cables, cable tray, and developing the lighting design for the plant. Subsequently, the Team will begin modeling all cable tray and electrical equipment; however, modeling will not be finalized until receipt of electrical equipment vendor drawings. Concurrently with the 3D modeling effort, the Team will develop the schedules, details, schematics, and wiring diagrams. Cable tray major electrical equipment will be modeled and included in the 60% and 90% reviews. Once the 3D model design is approved by WELLSPRING HYDRO during the planned multi-discipline model reviews, the power, cable tray sections and details will be developed along with the remaining detailed design deliverables and issued to WELLSPRING HYDRO for approval. All approval comments received from WELLSPRING HYDRO will be incorporated prior to the package issuing for construction.

3.4 Instrumentation

The Team will review P&ID's and update the instrument index to document the scope for the project. Budgetary pricing will be solicited and provided for all new instrumentation. The Team will confirm I/O requirements to provide to a third party for development of the DCS requirements. All instrument design will be progressed into Detailed Design resulting in IFA and IFC packages that will support procurement, safe fabrication/assembly and

installation by the selected contractors. Participation in the PHA during detailed design is planned for an Instrument Engineer. Any revisions to the process data as a result of the PHA, P&ID approval cycle, or equipment evaluations, including PFD and H&MB updates, may result in the reevaluation of instrumentation leading to the procurement of additional devices. Following PHA the instrument index will be updated with I/O requirements as needed to support delivery of information to WELLSPRING HYDRO's third party DCS vendor.

3.5 Procurement

During Detailed Design, a procurement agent will be assigned to facilitate bid invites, bid reviews, and final recommendations for all equipment packages. Procurement will expedite vendor data for long lead tagged equipment. Procurement estimate assumes all PO's will be issued by Wellspring Hydro. The Team will expedite vendor data and material/equipment delivery throughout the duration of the project. Procurement Status and Expediting Status reports will be issued within the weekly project report during Detail Design.

4.0 Deliverables

The following items are the anticipated deliverables associated with the scope of services for Chlor-Alkali 100 MTPD Cl_2 Greenfield Plant as described herein. These deliverables will be submitted electronically to the Wellspring Hydro Team via our Document Control system (NEWFORMA). The deliverables are:

4.1 Civil

1. 30%/60%/90% Design Review
2. Develop a scope of work for underground and topographic survey
3. Evaluate the Geotechnical data (By Wellspring Hydro)
4. One (1) Cover Sheet
5. One (1) General Notes Sheet
6. One (1) Existing Conditions & Demolition Sheet
7. Five (5) Civil Site Plans sheets (Area Specific)
8. Three (3) Erosion Control Plan Sheets
9. Five (5) Grading, Drainage and Paving Sheets
10. Six (6) Stormwater Plan and Profile Sheets
11. Four (4) Railroad Geometry Plan and Profile Sheets
12. Two (2) Railroad Cross Sections
13. Four (4) Civil Site and ECP Details
14. Five (5) Utility Plan Sheets
15. Two (2) Civil Site Geometry and Points Tables Sheets

4.2 Structural

1. 30%, 60% & 90% Model Reviews
2. 3D Modeling of Steel & Concrete
3. IFC General Notes & Standard Details for Concrete (10)
4. IFC Steel Drawings for Miscellaneous Pipe Supports (10)
5. IFC Foundation Drawings for Admin. Bldg., Guard House, Maintenance Bldg., Shipping/Loading Bldg. (7)

6. IFC Steel Drawings for Utility Racks (12)
7. IFC Foundation Drawings for Utility Racks (8)
8. IFC Foundation & Pit Drawings for Salt Storage Pile & Saturator (4)
9. IFC Foundation Drawings for Primary Brine Purification (10)
10. IFC Steel Drawings for Primary Brine Purification (10)
11. IFC Foundation Drawings for Secondary Brine Purification (14)
12. IFC Steel Drawings for Secondary Brine Purification (10)
13. IFC Foundation Drawings for Electrolyser, MCC, Control Room Buildings (10)
14. IFC Steel Drawings for Electrolyser Building (8)
15. IFC Foundation Drawings for De-Chlorination (8)
16. IFC Steel Drawings for De-Chlorination (8)
17. IFC Foundation Drawings for Caustic Dilution & Concentration (8)
18. IFC Steel Drawings for Caustic Dilution & Concentration (6)
19. IFC Foundation Drawings for Chlorine Gas Washing, Drying & Cooling (8)
20. IFC Steel Drawings for Chlorine Gas Washing, Drying & Cooling (8)
21. IFC Foundation Drawings for Chlorine Gas Liquefaction & Vaporization (8)
22. IFC Steel Drawings for Chlorine Gas Liquefaction & Vaporization (8)
23. IFC Foundation Drawings for Chlorine Gas Absorption (6)
24. IFC Steel Drawings for Chlorine Gas Absorption (6)

4.3 Architectural

1. IFC Architectural Packages (lead sheets, floor plans, life safety plan, elevations, sections, details, door & finish schedules) for the following buildings:
    - Electrolyser Building
    - Shipping/Loading Building
    - Administration Building
    - Control Room/QC Lab/Locker Room Building
    - Utility/Storage Building
    - Maintenance Building
    - Guard House

4.4 Process

1. Product/Plant Capacity Design Basis
2. Heat and Material Balance
3. Utility Balance
4. Development of PFDs (estimated 10)
5. Line Sizing Calculations
6. Development of Process P&IDs (74) to IFC Status (Drafting by Piping/Mechanical)

7. Development of Process/Mechanical Equipment List (for handover to Hargrove Mechanical group for ownership)
    - Estimated quantity of (195) line items anticipated based on similar projects broken down into (34) equipment packages
    - Vendor information updates for major equipment packages by Process listed in item 8 below (balance of equipment updates by Hargrove Mechanical):
8. Equipment Sizing Calculations for:
    - Pumps – Estimated 10 unique hydraulic calculations
    - Tanks – Sizing Calculations for estimated 8 unique tanks
    - Heat Exchangers – Sizing calculations for estimated 17 unique exchangers (15 P&F, 2 S&T)
    - Dechlor Tower
    - H2 Stack??
9. IFP Quality Equipment Specifications for twenty (20) Major Process Equipment Packages
    - Caustic Evaporation – Written Specification + Data Sheets
    - Ion Exchange Unit & Resin – Written Specification + Data Sheets
    - Brine Candle Filters – Written Specification + Data Sheets
    - EVS Package – Written Specification + Data Sheets
    - Chlorine Compression / Drying / Vaporization -Written Specification + Data Sheets
    - Brine Clarifier – Written Specification + Data Sheets
    - Deaeration Tower – Written Specification + Data Sheets
    - Dechlor Tower – Written Specification + Data Sheets
    - Demisters – Written Specification + Data Sheets
    - Fans & Blowers – Written Specification + Data Sheets
    - Filter Press – Written Specification + Data Sheets
    - H_2 Gas Scrubber – Written Specification + Data Sheets
    - HCl Unit – Written Specification + Data Sheets
    - Cl_2 Pumps – Written Specification + Data Sheets
    - Plate & Frame HX and Shell & Tube HXs – Written Specification + Data Sheets
    - Sulfate Removal System – Written Specification + Data Sheets
    - Vacuum Pumps – Written Specification + Data Sheets

    ** Complete procurement bid packages for these items to be developed by Hargrove Mechanical*
10. Process Data input to Hargrove Mechanical for development of IFP Quality Data Sheets and/or Specifications for inclusion in 14 additional bid packages:
    - Agitators (6 Unique Items)
    - Std Centrifugal Pumps (19 Unique Items)

- Chiller Package (1 Unique Item based on utility balance)
- Cl_2 Bullet Tanks
- Diaphragm Pumps (1 Unique Item)
- Field Erected Tanks (15 Unique Items)
- Mag Drive Pumps (9 Unique Items)
- Metering Pumps (1 Unique Items)
- Overhead Crane
- Salt Handling
- Shop Fab FRP Tanks (15 Unique Items)
- Shop Fab Metal Tanks (15 Unique Items)
- Truck Loading and Unloading (3 Unique Items)
- Rail Loading & Unloading (2 Unique Items)

11. Development of Technical Bid Tabulations for twenty (20) process equipment packages – Assumes 3 bids per package
12. Process input to Technical Bid Tabulations for fourteen (14) mechanical packages
13. Vendor drawing reviews for all purchased major process equipment
14. Hydraulic Case Scenario evaluations for instrument process data (3 cases per pump calculation)
15. Equipment Layout assistance to Mechanical
16. Process data input for line list
17. PHA Participation in Birmingham
18. PSV Engineering Packages – Actual quantity TBD during design (estimated 29)

4.5 Mechanical

1. IFB Equipment Packages (34)
2. Priced Equipment List
3. IFP Packages (34)
4. Mechanical Construction Scope of Work (SOW)

4.6 Building Mechanical

1. Building Mechanical Packages (lead sheets, spec sheets, fire protection coverage plan, duct work plan, plumbing plan, details, equipment schedules, airflow diagram, control diagram) for the following buildings:
    - Electrolyser Building
    - Shipping/Loading Building
    - Administration Building
    - Control Room/QC Lab/Locker Room Building
    - Utility/Storage Building
    - Maintenance Building
    - Guard House

1. **Piping**

1. 30%, 60% & 90%: Design Reviews (1per).
2. 3D Model.
3. Model process and mechanical equipment in CADWorx
4. P&ID CAD (74)
5. Integration of vendor models into the project
6. Plot Plan Drawing (1)
7. General Arrangement Drawings (10)
8. One (1) Line List -Total Line Count of (884) comprised of (388) large bore and (353) small bore lines
9. Development of Piping/Manual Valve Specifications
10. Engineered Supports List (1) Per Hargrove Procedure
11. Piping Isometrics for (388) large bore lines
12. Pipe Support Details- Standards.
13. Stress Analysis
14. Valve List. (1)
15. Specialty Item List (1)
16. Construction Scope of Work Packages (1)

4.7 Electrical

1. 30%, 60% & 90%: Model Reviews (1)
2. IFC-Cable and Conduit Schedule
3. IFC-Electrical Load List
4. IFC-Electrical Equipment List
5. IFI-Electrical Drawing List
6. IFI-Preferred Vendors List
7. IFI-Power Study Report with Load Study, Short Circuit, and Arc Flash results (1)
8. Specifications, Bid Reviews, Bid Tabs of the following electrical equipment:
    - Prefabricated Electric Centers
    - 15kV Switchgear
    - 5kV Switchgear
    - Low Voltage Power Transformers
    - 5kV MCCs
    - 600V Switchgear
    - Bus Duct
    - 5kV Variable Speed Drives
    - Medium Voltage Transformers
    - 600V Motor Control Centers

- 600V Variable Speed Drives
- Transformer-Rectifier System
- Automatic Transfer Switch
- Standby Generator
- Fire Alarm System
- Communication System
- UPS System
- Temporary Power System
- DC Voltage Systems
- DC Switches
- Substation Protection System
- Badging-Security System
- Voltage Monitoring
- Electric Heat Trace
- Polarization Rectifier System
- Capacitor Bank
- Bus
- Packaged Equipment E&I Requirements

9. IFC-Construction Electrical Scope of Work (1)
10. IFC-Single Line Diagrams (35)
    - Site Overall Single Line Diagram
    - 15kV Single Line Diagram
    - 480V MCCS Single Line Diagrams
    - 480V Switchgear Single Line Diagrams
11. IFC Temporary Power Plans, Elevations, & Sections Drawings (10)
12. IFC Communications Power Plans, Elevations, & Sections Drawings (10)
13. IFC Motor Elementary Drawings (28)
14. IFC Mechanical vendor package Interconnection/Elementary Drawings (45)
15. IFC Transformer/Rectifier vendor package Interconnection/Elementary Drawings (40)
16. IFC Standby Generator vendor package Interconnection/Elementary Drawings (1)
17. IFC Fire Alarm & Signal Plans, Elevations, & Sections Drawings (10)
18. IFC Electrolyzer DC Switch System Interconnection/Elementary Drawings (2)
19. IFC DC Voltage Systems Interconnection/Elementary Drawings (2)
20. IFC Harmonic Filter Vendor Package Interconnection/Elementary Drawings (1)
21. IFC Automatic Transfer Switch Interconnection/Elementary Drawings (1)

22. IFC Communications, Fire Alarm & Signal, Security, and Substation Protection System Vendor Packages Interconnection/Elementary Drawings (4)
23. IFC Power Transformer/Switchgear/MCC Interconnection/Elementary Drawings (35)
24. IFC Circuit Panel Interconnection/Elementary Drawings (20)
25. IFC Power Distribution Center Vendor Package Interconnection/Elementary Drawings (1)
26. IFC System Architecture Diagram – Security (1)
27. IFC Building Electrical - Panel Schedules (7)
28. IFC UPS Systems Interconnection/Elementary Drawings (2)
29. IFC System Architecture Diagrams for the following
    - Fire Alarm & Signal (1)
    - Communications (1)
    - Substations Protection System (1)
30. IFC Power / Instrument Plans, Elevations, & Sections Drawings (10)
31. IFC Capacitor Bank Interconnection/Elementary Drawings (2)
32. IFC Equipment Arrangements (Power Distribution Center, Transformer/Rectifier Room, Electrolyzer Cell Room, Electrolyzer Cell Renewal Room, and Control Room) (5)
33. IFC Plans, Elevations, & Sections Drawings for the following:
    - Lighting (10)
    - Grounding (10)
    - Lightning Protection (10)
    - Duct Bank (10)
    - Security (10)
    - Cable Tray (10)
    - Area Classification (10)
    - Heat Trace (5)
34. IFC Building Electrical (Small Power, Lighting, and Systems) Plans (21)
35. IFC Electrical Standards and Installation Details (10)

4.8 Instrumentation

1. 30%, 60% & 90%: Model Reviews (1)
2. IFC - Instrument Index with I/O (1060 Device Tags) (1)
3. IFP – Data Sheets (424)
4. IFC – Instrument Drawing Index (1)
5. IFC – Instrument Location Plans (20)
6. IFC - Remote I/O Panel Wiring Drawings (20)
7. IFC - Field Junction Box Wiring Drawings (20)
8. IFD - Field Junction Box Layout Drawings (2)

9. IFC – Loop Sheets (848)
10. IFC – Installation Details (14)
11. IFD – Scope of Work for Detail Design Report (1)
12. IFC – Bid Construction Package (1)
13. Participation in PHA

4.9 Controls and Automation

1. SIL Calculations (56)
2. SIS Functional Specifications (56)
3. BPCS Functional Specifications (1)
4. BPCS Control Narrative (1)
5. 3rd Party Interface Specification (1)
6. I/O list (1)
7. Alarm List (1)
8. Communication I/O list (1)
9. Control Narratives (744)
10. Cause & Effect Matrix (1)
11. Network Architecture Drawing (1)
12. BPCS Configuration File (1)
13. SIS Configuration File (1)
14. Graphics Package (1)
15. BPCS FAT Procedure (1)
16. SIS FAT Procedure (1)
17. BPCS SAT Procedure (1)
18. SIS SAT Procedure (1)
19. Participation in PHA

4.10 Procurement

1. Weekly Procurement Status Report (1)
2. Weekly Expediting Status Report (1)
3. Bid Tabs for Mechanical Equipment, Non-Long Lead
4. Mechanical RFQ's, Non-Long Lead
5. Instrumentation RFQ, Non-Inline Devices
6. Bid Tabs for Instrumentation, Non-Inline Devices
7. Expedite Mechanical Equipment Vendor Data
8. Instrumentation Equipment Vendor Data (1 Lot)
9. Expedite PSV Vendor Data & Equipment (1)

4.11 General/Project Services

1. Level 3 Schedule
1. Weekly/Monthly Status and Cost Reports
2. Change management
3. Construction Package
4. Management of RFIs

6.0 Project Team

The Hargrove Team proposed for your project is highly skilled in technical capability, project experience, and operational background. This Team is committed to implementing a design that allows for a safe and undisrupted operation and meets all your project drivers.

Resumes are located in Section 14.0 – Appendix A.

7.0 Client Provided Items

1. Site location.
2. Geotechnical information.
3. Existing Code reviews for the buildings.
4. Access to the area, facilities, equipment, software, and documentation needed to complete the assigned task.
5. Internet access suitable for VPN connection for on-site Hargrove personnel to connect to the Hargrove network.
6. Any required permits to document/assist in engineering efforts.
7. Access to engineering, operations, and maintenance personnel who can address questions and issues.

8.0 Clarifications & Assumptions

8.1 General

1. The Detailed Design duration assumed to be 14 months (60 weeks).
2. Estimate assumes weekly coordination meetings and model reviews will be held virtually.
3. Proposal excludes fire suppression system; assumed to be "By Others".
4. Commissioning and Startup support is not included, but Hargrove can self-perform and hence provide this service as needed, upon request.

8.2 Process

1. Equipment scope for quantity of specifications, bids, and bid evaluations defined by the equipment listed. Vendor documentation reviews to be conducted for all purchased equipment during detailed design.
2. Hargrove proposes to use two-week duration for Wellspring Hydro IFA review for all engineering work packages. This duration can be reduced, as needed, with WELLSPRING HYDRO's support to improve on schedule performance.

8.3 Architectural

1. Architectural package is a basis for design build firm to provide final design, code summary and detail design documents.

8.4 Building Mechanical

1. Building mechanical to provide HVAC, fire protection and plumbing design basis.
2. Building electrical to provide convenience power, fire alarm and lighting.
3. Structural to provide foundations, footing and slab design for all buildings.

8.5 Civil

1. Hargrove will not be responsible for environmental, land development, stormwater, and utility permitting.
2. Hargrove assumes general contractor will be responsible for building permits.
3. Hargrove has excluded the development of the Construction Stormwater Pollution Prevention Plan (SWPPP) and State Notice of Intent (NOI).
4. Hargrove assumes the public utilities (water, sewer, etc.) are available at the project or property lines and have sufficient capacity and adequate pressure to support the planned project.
5. Civil design will be performed in AutoCAD Civil3D.

6. The project will be designed using a Plant Coordinate System. Civil has not included time associated with converting drawings to State Plane Coordinate (real coordinate systems) for permitting use. A PCN would be developed for this effort if required.
7. Client to provide a recent boundary, topo, and utility survey. All survey data provided shall be in State Plane Coordinates.
8. Proposal does not include civil discipline construction services, but these services can be provided at an additional fee.
9. Hargrove assumes client will provide all existing drawings in CAD format.
10. Hargrove excludes the development of project specific specifications (i.e., Specification Book).
11. Hargrove is not providing Leadership in Energy and Environmental Design (LEED) and/or other Sustainability Certification.
12. Hargrove assumes all waste lines (process and/or sanitary) will be gravity.
13. Hargrove has excluded landscaping and irrigation plans.
14. Hargrove assumes firewater systems will be designed by third party fire protection engineers. This service can be provided by Hargrove at an additional cost.
15. Hargrove assumes client has performed its due diligence and the target property is suitable for use.
16. Hargrove assumes the project site will be in Brunswick, Georgia.
17. Civil assumes duct bank will be designed by Hargrove Electrical and Structural Departments.
18. Civil assumes site lighting will be designed by Hargrove Electrical.
19. Civil will coordinate with process/building mechanical on sizing firewater mains. Process/building mechanical to provide the firewater modeling.
20. This proposal assumes four (4) sheets per section for scale.
21. Client SOW document lists Fencing plans; this proposal assumes fencing may be shown on drainage and grading sheets.

8.6 Structural

1. Truck loading / unloading structures are to be provided by the vendor as a package. Hargrove's responsibility is for the foundation design only.
2. Construction support is excluded.
3. Time is not included for visiting the site under the assumption a site visit is not required.
4. THE MISCELLANEOUS PIPE SUPPORT (MPS) SCOPE IS CURRENTLY UNDEFINED. AS A BASELINE, HARGROVE ASSUMES NO MORE THAN 100 ENGINEERED MISCELLANEOUS PIPE SUPPORTS WILL BE REQUIRED.

8.7 Piping

1. Piping design estimate does not include hours for fire protection.
2. This proposal assumes underground obstructions do not exist in the areas of our design.
3. All piping 2" in diameter and smaller will be field routed and not included in the 3D model.
4. Proposal is based on the following P&ID count for the project: Area 1000 (Salt Dissolving) - 2, Area 2000 (Brine Treatment) - 13, Area 3000 (Electrolysis) - 12, Area 7000 (Bleach) - 9, Area 9000 (Utilities) – 35.
5. One combined piping Line List and Valve List (incorporating all areas) will be controlled by Birmingham office with other offices having access to update it.
6. AREA 9000 - All vendor skid packages, and major equipment shall include a model that will be compatible with the project model. No equipment modeling hours are provided for Major Equipment or Skid Packages. Equipment not being modeled: Cooling Tower, Cell Transformer, Cell Rectifier, Cooling Water Treatment Package, Tepid Water System Package, D.I. Water System (including after Filter Package) Package, Air Compressor System Package, Nitrogen System Package, Cell Room Heaters, Laboratory Flume Hood, Package Boiler System, Neutralization Waste Caustic and Acid Pump Skids, Chilled Water System (Chiller Evaporator, Chiller Compressor, Chiller Condenser).

7. All small-bore piping (2" and below) shall be field routed, and field supported, unless it is an engineered line (steam, condensate, FRP, etc.). Assumed all steam and condensate piping 2-1/2" and less will not be engineered.
8. Proposal assumes no field trips required since this is a Green Field site.
9. Proposal assumes two (2) review cycles for each vendor package submitted.
10. Proposal assumes no construction support.
11. Standard details or installation details are not included.
12. Plans, Elevations, or Sections are not included, except for GA.
13. AREA 9000 – Proposal is based on modeling and extracting 166 Large Bore Lines.
14. Piping Lists (Line List and Valve List) will only be issued once.
15. There are no tie-ins since this is a Green Field site.
16. Bi-weekly internal model reviews will be held.
17. Proposal is based on 35 Unique Pipe Specifications.
18. 2D Piping Plan Drawings to not be issued, only isometrics.
19. Vibration Analysis, Pulsation or Acoustical Studies are not required.
20. Vendor or client to provide allowable nozzle loads for all equipment.

8.8 Mechanical

1. Hargrove assumes a maximum of three (3) bidders per equipment package.
2. It is assumed that only one round of clarifications (during bid evaluations) will be sufficient to determine if a vendor is technically acceptable or not.
3. 197 individual pieces of equipment were identified on the equipment list, it is assumed that duplicate items (for example an A/B pump pair or an X/Y exchanger pair) can be defined on one datasheet.
4. Equipment datasheets and specifications will not be issued as individual deliverables but will be issued as part of equipment requisition packages.
5. Requisition packages will be issued for approval (IFA), for bid (IFB) and then for purchase (IFP).
6. Estimate assumes it is acceptable to use Hargrove standard templates for datasheets, requisition packages, bid tabs, etc.
7. Hours for vendor data review assumes three (3) review cycles max per document.
8. Hours for vendor data review assume upon initial receipt of a vendor supplied submittal, all Hargrove disciplines and Wellspring Hydro will be included on that review. Except in the event of significant changes or major revisions, all subsequent submittals of the same document will only be reviewed by the Hargrove Mechanical team.
9. Mechanical's estimate excludes fire protection scope.
10. Mechanical assumes an average one (1) week review cycle for IFA submittals to WELLSPRING HYDRO. Hargrove will break review packages into project areas where possible to maintain reasonably sized packages for review. Review cycle durations for packages containing a larger quantity of documents will be discussed and agreed upon in advance of submittal.
11. Hargrove assumes mechanical equipment inspections will be addressed by others. This includes approval of manufacturing and testing procedures. Our RFQ packages will not contain equipment specific inspection and test plans; however, we will require vendors to submit these as part of their vendor data submittals.
12. The mechanical construction work package will serve as a Scope of Work document for a contractor to bid on for the installation of mechanical equipment associated with the project. This document will not be a step-by-step guide on how to install each individual component. Instead, it will define the equipment to be installed and provide the information necessary for a contractor to plan their work.

8.9 Electrical

1. Client to provide electrical preferred vendors for new site vendor list.
2. No MTO check estimates included.

3. No Project Job Data Books included.
4. No time for pre-bid and award meeting for constructors.
5. No site trips included.
6. No Construction Support included.
7. No As-Builts included.
8. No Medium voltage (4160V or 2400V) motors included in electrical distribution design. All site loads except for Transformer/Rectifiers assumed to be 480V or less.
9. No Conduit plans included.
10. Utility will provide 15kV or 25kV directly to site boundary. Duct bank will be designed from site boundary to new switchgear.
11. No conveying system for Area 1000 salt saturator, assumed salt brought in by truck.
12. Breaker settings programming onsite during commissioning is excluded. Hargrove will provide protective relay settings only.
13. Lighting contactors will be prewired by prefab building vendor and will be on lighting panels schedules.
14. Substation will be close to the site. Substation design is responsibility of Utility.
15. Harmonic study excluded. By harmonic filter vendor.
16. Safety training is not required for the Greenfield site.

8.10 Instrumentation

1. Communication and Alarm System is excluded.
2. The hours for Instrument Location Plan include the extraction from the model.
3. Off-line instruments will not be shown in the model.
4. All the instruments in the vendor package are provided by vendor.
5. Instruments assumed to be issued to a maximum of three (3) bidders during detailed design with one review cycle.
6. 3D modeling will be limited to new junction boxes, where applicable, and inline instruments only, which will be modeled by the Piping Design Team.
7. Hours for review of vendor packages are not included.
8. Hours for site trip are not included.
9. Hours for PHA/HAZOP are not included.
10. Hours for P&ID markup/collaboration are not included.
11. Hours for procurement of instrumentation are not included.
12. MTO check estimates are not included.
13. Project Job Data Books are not included.
14. As-Builts are not included.
15. Conduit plans are included.
16. Conveying system for Area 1000 salt saturator is not included.
17. Vendor supplied devices assumed prewired; not shipped loose.
18. Interface for controls integration is assumed for vendor packages; no individual wiring in DCS included for vendor packages.

8.11 Procurement

1. Procurement will expedite vendor data. Per Hargrove procedure, the Discipline Lead and Document Control will be responsible for tracking vendor document submittals and notifying Procurement when vendor submittals are incomplete.
2. Procurement Estimate assumes one (1) Round of Technical reviews per package.
3. Hours are not included for DCS hardware and software specification.
4. Hours are not included for communication, alarm system, and security system specifications.

8.12 Controls and Automation

1. Hargrove is not responsible for issues with plant scheduling or delays caused by operations, contractors, or weather that may delay the project schedule. Delays or additional site time spent resulting from schedule changes outside of Hargrove's control may result in additional time and rate expenses.
2. Unless otherwise specified, meetings associated with this project will be attended virtually via a teleconference service such as Microsoft Teams.
3. Action items assigned to the Wellspring Hydro Corporation team will be resolved in a timely manner.
4. One (1) review cycle is included in this Scope of Work. Any documents submitted to the Wellspring Hydro Corporation team for review will be returned to Hargrove within five (5) working days.
5. The included scope addresses the programming of an emergency shutdown system. A SIL rated system is not currently expected. As such, documentation for Safety Functions, to include SIL calculations, have not been included as part of this proposal. Hargrove has the capability to develop all required safety documentation. Pricing for those services will be provided upon request.
6. Control panels are not included in our proposal; however, our award-winning panel shop can provide the equipment upon request.

9.0 Schedule

The Chlor-Alkali effort will take approximately 12 months and can begin immediately after receipt of PO.

10.0 Commercial Offering

Hargrove and Associates, Inc. is pleased to provide this proposal for engineering and design services on a lump sum basis. Based on the recommendation from Wellspring Hydro, this offering is broken down into six (6) separate engineering deliverable packages, shown below.

This proposal is valid for 30 days.

10.1 Engineering Cost

The Balance of Engineering portion of this offering includes all multi-discipline Issued for Construction (IFC) drawings and documentation. Not included will be E&I specifications, data sheets, bid packages and bid evaluations.

For Balance of Engineering there are an estimated XX,XXX workhours to complete the work, which equates to a fee of **$XX,XXX,XXX** with the appropriate breakdown of discipline and support services noted below.

Table 1. Balance of Engineering Workhours:

Discipline	Workhours
Architecture	
Building Mechanical	
Piping	
Civil	
Structural	
Mechanical	
Instrumentation	
Electrical	
Process	
Project Management	
Project Controls	
Admin, Document Control	
Total	

10.2 Controls and Automation

The Controls and Automation portion of this offering includes all engineering and documentation needed to provide automation services. C&A will provide documentation, configuration, graphics, PHA, factory acceptance test (FAT), PSSR & site acceptance test (SAT), and startup support.

For Controls and Automation there are an estimated X,XXX workhours to complete the work, which equates to a fee of **$XXX,XXX** with the appropriate breakdown of discipline and support services noted below. NOTE: The Controls & Automation price assumes that Hargrove E&C will be performing all other disciplines.

Table 1. Controls and Automation Workhours:

Discipline	Workhours
C & A	
Total	

Please refer to Section 15.0 for information about Hargrove's Controls and Automation Group and Control Panel Shop.

11.0 Terms & Conditions

Terms of this proposal will be governed by the attached MSA between Hargrove and Associates, Inc., and Wellspring Hydro. Its terms and conditions apply to any purchase order accepted by Hargrove and Associates, Inc.

Any changes to this proposal/contract may constitute a "Change Order" to the contract that must be agreed upon by both parties before any work related to the change begins.

In the event the project is cancelled after notice to proceed (or signed contract or PO) has been received, Hargrove will be paid for its progress to date on the project.

Detailed Design (DD) Payment Schedule:

- Award/Kick Off Meeting - 20% of Cost
- DD baseline Schedule Release and Acceptance (Allowing 5 days for approval of the schedule. If approval is not received, invoice will be submitted on the 5th business day) = 5% of Cost
- IFC Pile Construction Package = 5% of DD Cost
- 30% Model Review = 15% of Cost
- IFC of Area Paving & Minor Foundation Construction Package = 15% of Cost
- 60% Model Review = 20% of Cost
- 90% Model Review = 15% of Cost
- IFC of final Engineering Work Package = 5% of Cost

Invoice payment processing shall be Net-30, unless otherwise noted.

12.0 Closing & Contact Information

Thank you for allowing Hargrove to submit its proposal for this project. We look forward to continuing to work with you on this and future projects. If this proposal is acceptable, please send a Purchase Order to: purchaseorders@hargrove-epc.com and scooper@hargrove-epc.com.

I look forward to meeting with you to discuss this proposal. If you have any questions in the meantime, please contact me.

Sincerely,

J. Scott Cooper | Director- Chlor-Alkali + Lithium
Hargrove and Associates, Inc. | Birmingham, AL
office: 205.484.0241 | c: 205.901.7887 | email: scooper@hargrove-epc.com

13.0 Appendix A - Resumes

13.1 Jason E. Traylor, PE

Controls + Automation Technical Consultant

Summary

Over fifteen years of experience in designing and programming industrial control systems, estimating, instrument specification, and control valve sizing. Also experienced with database management and design supervision. Industry experience includes chemical, Chlor-Alkali, pulp & paper, and other industrial projects. The scope of services in support of these projects included FEL studies, detail design, construction assistance, system checkout, and start-up.

Education

Bachelor of Science, Electrical Engineering

Auburn University, Auburn, AL

Professional Certifications

Professional Engineer, Alabama #308199

Professional Engineer, South Carolina # 1142334

Professional Engineer, Mississippi #30637

Experience

Hargrove Engineers + Constructors – Birmingham, AL
Controls + Automation Technical Consultant

- Enviva, Pellet Mill, Lucedale, MS – Lead Controls Engineer on the project. Responsible for work process scheduling, I/O list, control narratives, control system architecture design, network design, Rockwell Plant PAx configuration. Project goal greenfield pellet mill facility.
- WestRock, Brown Stock Washer, Panama City, FL – Lead Controls Engineer on the project. Responsible for P&ID development, work process scheduling, I/O list, control narratives, control system architecture design, Rockwell Plant PAx and Yokogawa Centum VP configuration, construction support, startup/commissioning support. Project goal was to install a new brown stock washer and increase pulp mill through put. As part of the production increase control and scheduling modifications were required to the batch digesters.
- Sabic, BPA VCU, Burkville, AL – E&I Engineer / Lead Controls Engineer / Project Engineer on the project. Responsible for P&ID development, work process scheduling, I/O list, control narratives, control system architecture design, motor elementaries, loop sheets, instrument index, Yokogawa ProSafe configuration, construction support, startup/commissioning support.
- CarbonFree, Caustic Evaporation Expansion, San Antonio, TX – Lead Controls Engineer on the project. Responsible for control narratives and Emerson DeltaV configuration.
- WestRock, Pulp Mill DCS Migration, Panama City, FL – Controls Engineer / Project Engineer on the project. Responsible for P&ID development, work process scheduling, I/O list, control narratives, control system architecture design, Rockwell Plant PAx configuration, construction support, startup/commissioning support.

- SCS, Plant Miller PLC to DCS Conversion – E&I Engineer on the project. Responsible for Electrical design to replace the existing PLC for Units 3 & 4 SCR and Top Ash systems with an ABB DCS.
- Ascend, Adipic Controls Modernization Project, Pensacola, FL - Controls Engineer on the project. Responsible for DeltaV configuration, and startup/commissioning support.
- Sabic, HCL BMS Conversion Project, Burkville, AL - Controls Engineer on the project. Project driver was to replace obsolete equipment. New equipment installation required NFPA and ISA84 compliance. Responsibilities included verification that configuration and instrumentation met NFPA requirements, drawing modifications, construction management, and startup/commissioning.

Engineering Consulting Firm - Birmingham, AL

Senior Discipline Engineer – Instrumentation and Controls

- WestRock, PB4 DCS Conversion Project, Florence, SC - Controls Engineer / Design Leader / Project Engineer on project. Responsible for P&ID development, work process scheduling, instrument index, I/O list, SAMA development, functional descriptions, control system architecture design, Honeywell Experion R430 configuration support, construction, support, startup support, commissioning.
- Molycorp Minerals, Mountain Pass, CA - Controls Engineer on project. Responsible for instrumentation functional descriptions and P&ID development.

Engineering Consulting Firm – Birmingham, Al

Principal Technical Professional – Instrumentation and Controls

- Molycorp Chlor-Alkali Project, Mountain Pass, CA - Controls Engineer on the project. Responsible for Allen Bradley Control Logix Configuration, Supplier Control System FAT
- Olin Chlor-Alkali Products Membrane Conversion Project, Charleston, TN - Controls Engineer on the project. Responsible for DeltaV configuration, DeltaV SIS configuration, I/O List, DCS Hardware specification, I/O Room Layout, Control System Architecture, Design/Implementation/Troubleshooting, Network Setup/Implementation
- PPG Membrane Conversion FEED Study, Natrium, WV - Instrument Design Leader on the project. Responsible for Instrument Pricing, Instrument Index, P&ID Development, Task Scheduling, Manpower Loading Projections
- Olin Chlor-Alkali Products, St. Gabriel, LA - Controls Engineer on the project. Responsible for interconnects for existing installations, Power Plans, Loop sheets for existing installations, Fiber Optic Network Layout and Termination List, P&ID design/revisions, Network Setup/Implementation, Yokogawa DCS Configuration, Rectifier controls, Construction support, Ctrl System Architecture Design/ Implementation/ Troubleshooting.
- Nova Chemicals, Bayport NOx Project, Bayport, TX - Instrument Engineer on the project. Responsible for loop Sheets, Cable Schedules, Interconnects, Motor Elementaries

- Bowater, Pulp Dryer Rebuild, Coosa Pines, AL - Instrument Engineer on the project. Responsible for location Plans, Cable Schedules
- Temple-Inland, OCC Production Increase, Orange, TX - Instrument Engineer on the project. Responsible for motor Elementaries, Power Plans, Interconnects
- Trinity TCP Project, Hamlet, NC - Instrument Engineer on the project. Responsible for valve Sizing, Instrument Specifications, Loop Sheets
- International Paper B-Grade Transfer, Courtland, AL - Instrument Engineer on the project. Responsible for instrument Specifications, Valve Sizing
- Owens Corning, Irving, TX - Instrument Engineer on the project. Responsible for instrument Specifications, Loop Sheets, Location Plans
- OCI Wyoming Alt. Energy Project, Green River, WY - Instrument Engineer on the project. Responsible for instrumentation specifications, cable schedules, Foxboro DCS I/O assignments, location plans, loop sheets, and cable length takeoffs.

Software and Training

- AutoCAD
- ProjectWise
- SmartPlant Instrumentation
- Control Networks: Ethernet I/P; DeviceNet; Modbus TCP/IP & RTU
- Control Systems: Emerson Delta V; Honeywell Experion; Rockwell ControlLogix; Rockwell Plant PAx; Yokogawa Centum VP; Yokogawa ProSafe

13.2 Adam "AJ" Freund, PE

Senior Electrical Engineer

Summary

Leader of design teams that consistently produced high quality products on time and under budget. Extensive CAD experience and proficient in Microsoft Office Suite with extensive knowledge with Excel including developing spreadsheets used company-wide to expedite electrical design.

Education

Bachelor of Science, Electrical and Computer Engineering

Ohio State University – Columbus, OH

Professional Certifications

Professional Engineer, Georgia

Professional Engineer, Ohio

Professional Engineer, Pennsylvania

Professional Engineer, Texas

Professional Engineer, Utah

Experience

Hargrove Engineers & Constructors – Birmingham, AL
Senior Electrical Engineer

Lead Electrical Engineer supporting single and multi-discipline projects, including project definition and detailed design phases. Responsible for planning and coordinating the work of the electrical design in a specific small, medium, or large-sized projects. Performs all aspects for complete design of electrical and instrumentation engineering tasks on client projects. Recent projects include:

- Westlake Chemical, GEIS Chlor-Alkali Expansion Project, Geismar, LA – FEL3 and Detailed Design effort to expand the capacity of the plant by 110 KTPA ECU.
- Olin Chlor Alkali Products, CHAS #9 Rectifier Replacement, Charleston, TN - FEL-3 engineering services in support of the rectifier replacements including timing and resource requirements to facilitate the FEL-3 in support of the installation of the rectifiers.
- MP Materials Corp., Storage & Unloading Project, Mountain Pass, CA – Detailed Design. Refurbishment of 2 large (168,000 gallon) HCL tanks, scrubber, 2 unloading stations, containment modifications, required piping and safety facilities as required.

Engineering Consulting Firm – Columbus, OH & Temperance, MI
Senior Electrical Engineer

- Electrical discipline engineering and design team leader on projects for new and existing industrial facilities.

- Projects ranged from less than 100 electrical engineering and design man hours to over 5,000. Typically, responsible for multiple projects with overlapping schedules.
- Developed strategy for project completion, coordinated detailed aspects of engineering and design work, and coordinated tasks among engineers and designers.
- Electrical representative in project meetings with project management, clients, contractors, and others.
- Developed project specific design criteria and specifications for equipment procurement and construction.
- Designed highly available low and medium voltage power distribution systems.
- Designed and programed protective relaying schemes to enhance equipment and personnel protection.
- Performed short circuit analysis, motor starting analysis, protective device coordination, and arc-flash analysis.
- Specified and designed grounding and bonding systems for equipment and structures.
- Facility lighting design to applicable standards and client specification using lighting design software.
- Performed facility Area Classification analysis to determine classification based on applicable standards.
- Heat Trace specification and design for freeze protection and process related applications.
- Experienced in supporting electrical construction and commissioning in the field

Engineering Consulting Firm – Toledo, OH
Electrical Project Engineer

- Responsible for the electrical and controls design on projects for new and existing wastewater facilities
- Produced design drawings and specifications

American Municipal Power – Columbus, OH
Power Dispatcher

- Forecasted municipality electrical loads, based on historical data, for electrical power market strategies
- Effectively communicated verbal orders to carry out critical directives and assign orders.
- Worked in an isolated environment; had to make critical decisions independently.

Software and Training

- Microsoft Office Suite
- EasyPower
- ETAP
- CAD
- NEC

13.3 M. Andy Faulk, PE, LEED AP

Civil/Structural Engineering Leader

Summary

Over twenty years of experience as a senior level engineering, construction, and management professional with over 10 years' experience in evaluating and designing physical infrastructure in areas such as water treatment, site-civil, transportation and wireless communications.

Education

Bachelor of Science, Civil Engineering

University of Alabama at Birmingham

Professional Certifications

Professional Licensure State of Alabama (PE), License #28719

Professional Licensure State of Arkansas (PE), License #20373

Professional Licensure State of Georgia (PE), License #047891

Professional Licensure State of Illinois (PE), License #62.072972

Professional Licensure State of Kentucky (PE), License #36438

Professional Licensure State of Louisiana (PE), License #46667

Professional Licensure State of Rhode Island (PE), License #0014339

Professional Licensure State of Tennessee (PE), License #114339

Professional Licensure State of Texas (PE), License #143784

Professional Memberships

American Society of Civil Engineers

American Water Works Association

Engineers Without Borders

Experience

Hargrove Engineers & Constructors – Decatur, AL
Civil/Structural Engineering Leader

Responsible for the management of the Decatur and Memphis Civil/Structural Teams; Resource Leader to a twelve-person Team of civil and structural engineers and designers. Representative projects:

- Daikin MCC Expansion Detailed Design, Decatur, AL – Responsible for the survey and civil site design for a new motor control center. The project entailed a new access road, stormwater mitigation, site grading and a grade wall for the new facility.

- Daikin Industrial Water Infrastructure Detailed Design, Decatur, AL – Responsible for the survey and civil site design of a new 10-inch industrial water line and two, large section, HS20 rated trenches.
- Boeing, St. Charles Tract 5 Expansion Detail Design, St. Charles, MO – Responsible for civil site design and specifications package for a large testing facility. Design included bunkers, roadways, storm water/flood mitigation and utilities.
- Ascend, Fire Protection Infrastructure Detailed Design, Decatur, AL – Responsible for system modeling, testing, and planning for maintenance and upgrades. Was a phased replacement of deteriorated lines within the facility.
- Aquatech, Wastewater Treatment Plant Detailed Design, Huntsville, AL – Responsible for civil site design and utility coordination for a new wastewater treatment facility planned for a new automotive facility.
- Chemours, Trade Waste Infrastructure Remediation, Memphis, TN – Responsible for the inspection and remedial design of two large settling ponds and the diversion structure used in the wastewater pretreatment train at the facility.
- Peroxychem, Maxson Facility Flood Mitigation Study, Memphis, TN – Responsible for the evaluation of the facilities flood potential and review of the large contact basin's potential for uplift due to the river's flood stages.
- Huntsman, Earthen Dam Rehabilitation, Conroe, TX – Inspection and design of rehabilitation for overflow structure that water was bypassing.

Madison Utilities, Madison, Al

Water System Engineer

Responsible for managing the engineering and mapping for the utility, as well as was the liaison to the City of Madison. Responsible for water quality and regulatory compliance. Manager for the water system maintenance and construction crew. Representative projects:

- Highland Lakes Sewer System Expansion Detailed Design
- Palmer Road Sanitary Sewer Rehabilitation
- Bradford Creek Sanitary Sewer Rehabilitation
- Western Area Sewer Master Plan

Consulting Engineer, Hartselle, Al

Contract

Provided infrastructure and site design, construction cost estimates to clients. Representative projects:

- ALDOT Safe Routes To School projects in Perry County, Macon County, Mobile County and Lowndes County.
- Verizon Cell Phone Tower Evaluation and Site Designs in Dyersburg, TN, Chickasaw, TN and Trenton, TN.
- Life Church of Hartselle Building Expansion Detailed Design
- Tara Manufacturing Facility Expansion Detailed Design

Key Engineering, Inc., Decatur/Huntsville, AL

Department Manager for the civil engineering and survey group, also the branch office manager for the Huntsville office. Representative projects:

- Hampton Cove School Cueing Lanes and Site Improvements Detailed Design
- Whitesburg Elementary School Ceuing Lanes and Site Improvements Detailed Design
- Providence Elementary School Site Improvements Detailed Design

Wiser Company, LLC, Birmingham, AL

Senior Project Engineer

Managed a design team for transportation and site development projects.

- Performed collector and arterial roadway designs
- Designed residential site and utility plans
- Provided planning, permitting and logistics designs for mining

Malcolm Pirnie, Inc.(ARCADIS), Birmingham, AL

Environmental Consultant

- Developed erosion control plans and grading plans
- Designed upgrades to potable water distribution systems
- R&D and Regulatory Projects
- Designed process piping and controls integration for treatment plants

Publications

Finalist for 2008 Young Engineer of the Year, Engineering Council of Birmingham

Filter Performance – What Should a Good Filter Look Like? – Co-Author Featured at the 2005 AWWA, San Francisco, CA

Design and Operation of Water Storage Tanks for Optimum Mixing – Co-Author and Presenter; Featured at the Alabama/Mississippi Section, AWWA 2006

Software and Training

- Microsoft Project
- Autodesk Storm and Sanitary
- Project Management Certification
- Autodesk Civil 3D
- Project Management Skills of the Future

13.4 Glen A. Carter, PE

Civil/Structural Engineering Leader

Summary

Professional engineer with over 30 years of experience in structural design and construction. Expertise and knowledge gained through various industrial markets including coal power plants, nuclear power plants, manufacturing facilities, pulp and paper and chemical plants.

Education

Bachelor of Science, Civil Engineering

University of Alabama – Tuscaloosa, AL

Professional Certifications

Professional Engineer, Alabama #25720

Professional Engineer, Arkansas #17109

Professional Engineer, Kansas #26396

Professional Engineer, Kentucky #33849

Professional Engineer, Louisiana #38224

Professional Engineer, Mississippi #25005

Professional Engineer, Tennessee #121392

Professional Engineer, Texas #130148

Professional Memberships

American Institute of Steel Construction, Member

Experience

Hargrove Engineers & Constructors – Birmingham, AL
C/S Engineering Leader

- BASF, Chemical Plant, West Memphis, AR - Design of 140-foot span pipe bridge and spread footing foundations for plant located in a high seismic region.
- Dow-Corning Silicon Metal Plant, Mount Meigs, AL - Evaluation of existing furnace building for increased loading of refractory lined ductwork.
- Dow-Corning Silicon Metal Plant, Mount Meigs, AL – Support steel and foundation mat design for new Dust Collection System.
- Georgia Pacific Woodyard Project, Alabama River Cellulose (ARC) – 530' Diameter Concrete Ring Beam design for Stacker/Reclaimer.
- Georgia Pacific Fiberline Upgrade Project, Monticello, MS – Design of Roll Storage Building and MCC Building.
- Honeywell Phenol Storage Project FEL3, Hopewell, VA – Design of foundation and containment for 60' diameter Phenol storage tank.

- WestRock Printkote Conversion Project, Demopolis, AL. – Design of Roll Storage Building extension.
- GEO Specialty Chemicals, Coosa Pines, AL - Design of ore silo roof and access walkway replacement.
- Johns Manville, Fiberglass Insulation Plant, Etowah, TN - Design of access platform and monorail systems.
- Valspar Coatings, Manufacturing Plant, Birmingham, AL - 20,000-gallon tank anchoring system evaluation
- Syngenta, Chemical Plant, St. Gabriel, LA - Concrete Floor calculations for 75,000 lb. ISO Container Unloading.

Engineering Consulting Firm – Birmingham, AL
Design Engineer

- Solid Waste Authority of Pal Beach County, Boiler Support Structure, West Palm Beach FL

Engineering Consulting Firm – Birmingham, AL
Design Engineer

- Florida Power and Light, Turkey Point Nuclear Plant, Florida City, FL - Responsible for evaluation and modification of Turbine Building Operating Floor for EPU (Extended Power Up-Rate) Project.
- Progress Energy, Crystal River Nuclear Plant, Crystal River, FL - Responsible for evaluation and modification of existing beam and bracing connections for Auxiliary Building Crane Upgrade.
- University of Arizona, Reactor Decommissioning Project, Tucson, AZ - Responsible for design of steel support system for removal of contaminated portion of concrete Reactor Tank.

Engineering Consulting Firm – Birmingham, AL
Design Engineer

- WE Energies AQCS Project, South Oak Creek, WI - Structural engineer for the design of Selective Catalytic Reduction (SCR) and Gas-to-Gas Heater (GGH) support structure.
- Monsanto Seed Corn Facility, Boone, IA - Structural engineer for the design of Sheller Building and Yard Conveyor support trusses.

Southern Company Services – Birmingham, AL
Design Engineer

- Gorgas Steam Plant, Parrish AL—Flue Gas Desulfurization (FGD) Project - responsible for design of FGD ductwork. Components of design included duct plate,

external stiffeners, internal bracing, turning vanes, support legs, expansion joints, and slide bearings.

- Plant Gaston, Wilsonville AL - Balanced Draft Conversion (BDC) Project; responsible for strengthening of existing FGD ductwork due to increase in internal design pressure. Components included duct plate, external stiffeners, internal bracing, and support system.

ALSTOM Power – Knoxville, TX
Design Engineer

Responsible for performing and checking structural calculations for flue gas ductwork, flue gas ductwork support steel, SCR access steel, and fabric filter support steel.

Structural Design Solutions – Birmingham, AL
Design Engineer

Performed structural calculations and detailed design sketches of bolted and welded connections, reviewed fabricator's shop drawings for compliance with connection design. Reviewed stair and handrail shop drawings for compliance with building codes.

- Structural Steel Services, Steel Fabrication Plant, Meridian, MS
- Knauf Fiberglass, Fiberglass Manufacturing Facility, Opelika, AL
- Dixie Arc, Manufacturing Facility, Birmingham, AL

Engineering Consulting Firm – Greenville, SC
Design Engineer

Performed structural calculations for paper machine support structure.

ABB Environmental Systems – Birmingham, AL
Design Engineer

Performed structural calculations for flue gas ductwork, flue gas ductwork support steel, piping, and cable tray support steel, provided on-site troubleshooting for FGD building construction, performed structural inspection of electrostatic precipitators, estimated steel tonnage, and structural man hours for proposals.

Software and Training

- AISC
- ACI 318
- ASCE 7
- Mathcad
- IBC
- RISA
- STAAD Pro
- GT STRUDL

13.5 Michael Gear

Mechanical Engineer

Summary

Broadly experienced leader with manufacturing, continuous improvement, quality, engineering, and maintenance management background. Experience gained with leading high performing engineers and maintenance technicians with organized troubleshooting tools, design engineering to reduce maintenance time, and leading OEE teams using Six Sigma tools and methods. Involvement includes developing plant metrics, PM compliance metrics, OEE metrics, product design, manufacturing and test engineering, and customer service.

Education

Bachelor of Science, Mechanical Engineering

University of Alabama – Tuscaloosa, AL

Experience

Hargrove Engineers & Constructors – Birmingham, AL
Mechanical Engineer V

GAF – Tuscaloosa, LA
Technical Services / Maintenance Manager

- Provided direction, coordination, and support for the daily execution of the maintenance department's operating plan with the primary objective of continuous OEE improvement and maintaining the plant's equipment and facilities.
- Ensured that all safe work practices were implemented and followed by the department and instilled GAF's safety culture into the daily work environment of the maintenance/process engineering and quality department.
- Provided technical and managerial leadership to the functions of equipment reliability, maintenance planning and scheduling, facility maintenance, training, computerized maintenance management systems (CMMS), and root cause failure analysis. Launched and championed the OEE team program and improved OEE from 80% in 2021 to 87% average in 2022 with a goal of 90% in 2023.
- Established maintenance metric program that improved PM compliance from 65% to 90%. Launched and champion the RCFA program that reduced special cause events by 30%. Optimized maintenance scheduled downtime to meet the goal of 6.5MM squares for 2022.
- Directed and coordinated design, construction, and maintenance of equipment and machinery. Coordinated development, submission, and approval of annual capital plan. Evaluated and designed new equipment systems and recommended modifications for continuous improvement in an effort to minimize cost, optimize maintenance and production capabilities, and enhance safety. Maintained an overall quality system that guarantees customer satisfaction and for driving process improvement activities for the facility.

- Supported the Operations group in meeting or exceeding budgeted production rates and uptime targets. Sought out ways that the Quality and Process Engineering teams can help increase OEE (scrap rate, slow time, and uptime) and deploy resources accordingly. Ensured 100% compliance with all environmental permitting and regulations. Ensured all reporting requirements were completed as required.

Process Engineer III

Promoted product/process improvement changes by using daily plant interactions, review of online testing, process data review, equipment inspections, and claims feedback. Submitted and implemented changes in procedures and processed to support productivity, process, cost, reliability and quality improvement. Resource for process technical knowledge and participates in plant problem solving and debottlenecking

efforts. Provided support for on call requirements or daily problems on the floor as needed. Completed high level technical reporting for activities including changes in plant operating conditions, changes in raw materials, quality performance, trial activities, variation reduction activities, and process improvement activities. Include abbreviated results of these activities in the department monthly summary. Developed operating instructions, troubleshot guides or process target guidance for all manufacturing

processes or new equipment as needed. Provided training of new procedures approved through the PCN system.

TAMKO Building Products – Tuscaloosa, LA
Process Engineer

Promoted product/process improvement changes by using daily plant interactions, reviewed online testing, processed data review, equipment inspections, and claimed feedback. Submitted and implemented changes in procedures and process to support productivity, process, cost, reliability and quality improvement. Researched, studied, and executed statistical analysis of process improvements to gain optimal performance of

processes, equipment, and reliability initiatives. Requested and executed CAPEX projects, ranging from $25k - $14 million, for continuous process improvement and automation. Developed, improved, and trained operations personnel on new and revised operating procedures, including processes and equipment. Designed, tested, and troubleshot various types of equipment as the subject matter expert for key

improvement initiatives. Lead Root Cause Problem Elimination for special cause and common cause incidents.

Southern Nuclear Operating Company – Birmingham, AL
Senior Mechanical Design Engineer

Maintained the design basis calculations through plant modifications, simulated scenarios, and developed equipment specifications to maintain the plant systems performance requirements. Performed, maintained, and improved calculations, specifications, and other documentation supporting the nuclear fleet's design and licensing bases. Developed and launched new engineering processes, policies, and programs to improve engineering effectiveness. Investigate/resolve engineering issues in accordance with the corrective action program. Provided guidance and direction to plant engineers regarding design calculations, performance requirements, and equipment requirements.

NACCO Materials Handling Group – Sulligent, AL
Manufacturing Engineer

Manufacturing Engineer responsible for the performance and optimization of the machining department for forklift components using lean manufacturing and Kaizen methodology. Design Engineering of production tools, fixtures, and machines. Oversaw installation of new equipment; ensure satisfactory performance of new and existing equipment and instruct employees on operation of all equipment. Coordinated launch of new products with clients, product engineering, and other departments within the organization to sustain the company's competitive edge.

Southern Heat Exchanger – Tuscaloosa, AL
Senior Project Design Engineer

Mechanical and thermal design of heat exchangers, steam generators and pressure vessels per customer specifications, TEMA standards, and ASME pressure vessel codes. Performed mechanical calculations to provide client with maximum operating conditions. Generated and maintained bill of materials and technical drawings. Provided direction and oversight to fabricators to ensure testing compliance with ASME codes and regulations.

13.6 Jeff R. Haslam

Mechanical/Piping Technical Specialist

Summary

Mechanical and piping designer with over 40 years of engineering design experience. Expertise in equipment layout, piping design, machine design, material specifications, construction field support, fabrication/manufacturing techniques, laser scanning, procurement, purchasing, and piping support system requirements.

Education

associate degree-Applied Science/Mechanical Design

Texas State Technical Institute-Waco, TX

Experience

Hargrove Engineers + Constructors - Birmingham, AL
M/P Technical Specialist III

- 5E Advanced Materials Mining Chemical Processing Plant
- Li-Cycle Battery Recycling Plant FEL3, Rochester, NY
- Carbon Free Chemicals, San Antonio, TX - 50% Caustic Evaporator
- Hunt Refinery, Tuscaloosa, AL - Rail Unloading, Tank 16, and Truck Loading Stations
- Georgia Pacific, Monticello, MS - New Liquor Tanks
- CVR Energy, Coffey, KS - PSV Replacement Projects
- Chevron, Pascagoula, MS – Fluid Catalytic Cracking (FCC) Upgrade
- Carbonfree – Caustic Evaporation Project
- Verso – Quinnesec FEL Study
- Kimberly-Clark – Tissue Machine / OCC Conversion Detailed Design
- Olin – Install Rectifier, Infrastructure, and Facilities

Southern Company Services - Birmingham, AL

Piping Design Leader

- NCCC Testing Facility - Wilsonville, AL - Refitting of experimental Carbon Capture systems. Design, procurement, and construction direction

Engineering Consultant - Birmingham, AL

Piping Design Leader

- Graphic Packaging International - W. Monroe, LA and Macon, GA
- Georgia Pacific - Big Island, VA
- Green Back Packaging-Morrilton, AR
- Molycorp - Mountainpass, CA

Engineering Consulting Firm-Birmingham, AL

Mechanical Department Manager

Piping Design Leader

- RockTenn Hodge - LA
- Bowater-Coosa Pines, LA
- Voith Tissue Machine
- ILIM Group-Kotlas Russia
- Inland-Bogalusa, LA
- Inland-Rome GA
- MeadWestvaco Corporation-Wycliffe, KY
- Potlach Corporation-McGehee, AR
- International Paper-Jay, ME
- International Paper-Selma, AL
- Gulf State Paper Corporation-Demopolis, AL
- Georgia-Pacific-Cedar Springs, GA
- Weyerhaeuser-Valiant, OK
- Packaging Corporation of American-Counce, TN
- Carter Holt Harvey-Tokoroa, New Zealand
- Westvaco Corp.-Covington, VA
- Gulf State Paper Co-Demopolis, Al
- Vulcan Chemicals, Integrated Chlorine dioxide plant

Texas Instruments-Dallas, TX

Equipment, Manufacturing, Field Testing Designer

Led design projects for the Military products division

Software and Training

- CADWorx
- Navisworks
- Plant 3D AutoCAD
- Bentley-Intergraph MicroStation
- Microcadd
- CADDCentre's Plant Design and Management System
- Cyra Cyclone

13.7 Reggie Chambliss

Process Engineer

Summary

Over nine years of experience in chemical process engineering design and project engineering, including Chlor-Alkali and Lithium. Engineering career has been equally split between office and field assignments. Process work includes P&ID development, equipment specification and pricing, vendor bid and drawings evaluation, PSV calculations, and hydraulic calculations. Onsite project engineering capabilities include managing small Capex projects, system walkdowns, vendor and client coordination, change order initiation, PSSRs, and EHS compliance. Successfully executed FEL and detailed design projects as process design lead and team support.

Education

Bachelor of Science, Chemical Engineering

Tuskegee University—Tuskegee, AL

Experience

Hargrove Engineers & Constructors – Birmingham, AL
Process Engineer III

- Chemicals Client During Detailed Design
  - Upgraded inadequate equipment for pH adjustment step in process
  - Performed bid evaluations on equipment.
  - P&ID management and PHA participation
- Chemicals Client, HCl Storage & Unloading DD - Lead equipment specification effort.
- Chemicals Client, Pump Spare Program DD
  - Created pump datasheets for quote and purchase.
  - Trained newer teammate in Hargrove standards and policies
  - Provided checking for datasheets, lists and P&IDs
- Chlor-Alkali Client, Caustic Evaporator FEL3
  - Revamp current two-effect evaporator to three-effect system
  - Close coordination with the other design disciplines
- Lithium Client Project
  - P&ID management
  - Spec development and datasheet creation
  - Hydraulic calculations
- Chemicals Client, P&ID Development
  - Verified and marked P&IDs in production units during onsite assignment.
  - Coordinated P&ID revisions and equipment drawing updates from Client to Hargrove team.
- Chlor-Alkali Client, Cl_2 Liquefaction FEL2
  - Supported Cl_2 Liquefaction Upgrade project by developing P&ID sketches in Bluebeam and performing rough vessel and line sizing calculations
- Chemicals Client, Utilities Expansion DD
  - Performed PSV calculations on Incinerator project as Design Lead
  - Completed bid tabulations on various pieces of equipment on Incinerator project
- Advanced Materials Client During FEL2

  - Developed Engineering Requisition Worksheets and equipment list to provide various equipment pricing estimate
  - Supported Title III project by completing redlines to P&IDs and quoting metal analyzer
- Advanced Materials Client During Detailed Design - Supported PMI project (HELIX Integration Team) as onsite Project Engineer.
- Specialty Chemicals Client, Therminol Vaporizer FEL3/DD
  - Supported project at Mobile office and onsite
  - Coordinated P&ID revisions and equipment drawing updates from Client to Hargrove team
  - Initiated PCNs for changes to the P&IDs, equipment drawings, and process-related design and information
- Tire Manufacturing Client, Wastewater Study FEL - Performed wastewater study after site walkdown and coordination with Client.
- Chlor-Alkali Client, Cl_2 Liquefaction FEL2 - Performed process study on the Diaphragm Chlorine Stripper control system which included Aspen modeling and heat & material balance optimization.

Hargrove Engineers & Constructors – McIntosh, AL (BASF)
Process Engineer II (Technical Services)

- Developed project scopes, generated, and obtained cost estimates, and prepared appropriation funding requests.
- Managed and tracked project milestones, made necessary adjustments to project and communicated project status with stake holders.
- Developed and maintained all project deliverables throughout the project lifecycle.
- Ensured compliance with EHS requirements to promote a safe working environment.
- Requested and coordinated required discipline engineering and design resources.
- Maintained SAP project data entries, monitored project progress, and performed status reporting.
- Developed and maintained partnerships with project manufacturing representatives and vendors to execute projects.
- Provided technical training for newly hired project engineers.

nextSource – McIntosh, AL (BASF)
Maintenance Engineering Support

Verified sites inventory of rupture discs. Worked on team to complete vessel inspections.

Process Engineering Support (BASF)

- Verified piping & instrumentation diagrams in production units throughout the plant site.
- Project Engineer for small capital projects to support process improvement.
- Used process drafting (MicroStation), design (PSV_Calc) and simulation (Aspen) software.
- Performed calculations for pressure/vacuum relief vents and valves.

- Developed process flow diagrams and piping & instrumentation diagrams.
- Generated equipment specifications and material safety data sheets.

Software and Training

- Revu Bluebeam
- AFT Fathom & Arrow
- Aspen
- MicroStation Power Draft V8i
- SAP for Project Management
- INTools—SmartPlant Instrumentation
- PSV Calc
- EKATO Corp Mixing 101 Training
- 3EPLUS by North American Insulation Manufacturers Association (NAIMA)
- Citrix
- Microsoft Office
- CPR, First Aid and AED Training

13.8 Andrew B. Johnson

Project Controls Manager

Summary

Forty-two years of experience in and Project Controls and project coordination in the Power, Pulp & Paper, foods, manufacturing, aluminum, and chemical industries. Background includes cost control, budget preparation, and scheduling for industrial engineering and construction projects. Served as a cost engineer, scheduling engineer, safety supervisor, resident project engineer, start-up coordinator, and contracts administrator. Experienced in budget preparation, monitoring, and projections. Knowledgeable in subcontract scheduling, shutdown scheduling, and schedule updating. Familiar with computerized systems, including earned value reporting, cost and commitment reports, forecasts, cash flow curves, workforce schedules. Experienced in providing coordination of engineering, general contractors, and subcontractors.

Education

Associate of Science, Business Administration

Roane State Community College – Harriman, TN

Experience

Hargrove Engineers + Constructors – Birmingham, AL
Project Controls Manager

Responsible for Project schedule development and Maintenance for DFS, Detail Engineering, Procurement and Construction Management.

- Li - Cycle – Commercial Hub – Rochester, NY

Power Experience

- Southern Company, Birmingham, AL – Outage Planning and Scheduling - Developed and maintained Spring 2021 outage schedules for Alabama Power's Central Alabama, Combined Cycle 3x1, Hot Gas Pass and Mississippi Powers Plant Ratcliffe, 2x1 Combine Cycle HRSG Bundle Replacement, and CT Rotor replacement.
- Interstate Power & Light, Marshalltown, IA - EPC Project Controls Manager - Combined Cycle Project. Responsible for day-to-day management of project controls personnel assigned to the project. Responsible for supervision and coordination of construction cost engineering, procurement scheduling, and construction planning, and engineering planning on assigned projects. Supervised budget preparation, estimate-to-complete projections, job progress, overall scheduling and cost reporting for labor and materials, along with total materials management in accordance with project requirements.
- Kentucky Utilities, Ghent, KY - EPC Project Controls Manager - Environmental air compliance project. Responsible for day-to-day management of project controls personnel assigned to the project. Responsible for supervision and coordination of construction cost engineering, procurement scheduling, and construction planning, and engineering planning on assigned projects. Supervised budget preparation,

estimate-to-complete projections, job progress, overall scheduling and cost reporting for labor and materials, along with total materials management in accordance with project requirements.

- Enercon Services, Kennesaw, GA - Project Controls Manager - Responsible for Project Controls Department development. Developed and implemented project controls methods and procedures. Developed project schedules and earned value reporting systems and format. Responsible for developing resources and for hiring and expanding the project controls group.
- Wisconsin Energies, Oak Creek, WI - Project Controls Manager - Engineering planning for SCR project.

Heavy Industrial Experience

- PEMEX, Dos Bocos Pariso, Mexico, Master Project Planner - Gas Roots Refinery - Utilities
- International Paper, Riverdale, AL - Master Project Planner, Project Bridge – PM Rebuild and OCC
- Ashland, Calvert City, KY, EPC Project Planner - VP Project
- Solvay, Greenville, TX, Augusta, GA, Greenville, SC, EPC Project Planner - RTM Project & M7 Project; HMDA Project & PGA Project; Primospire Project
- International Paper, Vicksburg, MS - Construction Planner - PM Rebuild (Press), Drives & OCC Upgrade Project
- International Paper, Maysville, KY - Engineering CM Planner - Capacity Increase and New OCC Project
- International Paper, Various Locations - Master Project Planner - REO Projects; Prepare Project Master Schedules for projects as required.
- Molycorp, Mountain Pass, CA - EPC Project Controls Manager - Project Phoenix for a Chlor-Alkali facility. Responsible for day-to-day management of project controls personnel assigned to the project. Supervised and coordinated construction cost engineering, procurement scheduling, construction planning, and engineering planning on assigned projects; supervised budget preparation, estimate-to-complete projections, job progress, overall scheduling and cost reporting for labor and materials, along with total materials management in accordance with project requirements.
- Georgia Gulf Chemicals & Vinyl, Plaquemine, LA - Project Controls Manager - Modernization and expansion project at a polyvinyl chloride (PVC) resins production plant.
- Gerber, Ft. Smith, AR - Project Controls Manager - Baby food processing facility.
- Solutia, Decatur, AL - Project Controls Manager - New Co-Gen boiler project.
- Yoplait, Murfreesboro, TN & Carson, CA - Project Controls Manager - New yogurt facility.
- General Mills, Martel, OH - Project Controls Manager - Perrier, Houston, TX - Project Controls Manager
- Weyerhaeuser, Columbus, MS - Project Controls Manager - Boiler outages.
- MeadWestvaco, Mahrt, AL - Project Controls Manager - Boiler outages.

- Solutia, Decatur, AL - Project Controls Manager - Co-Gen project.
- Gilman Paper Company, St. Mary's, GA - Project Controls Manager - Cluster Rules compliance project.
- U.S. Alliance, Coosa Pines, AL - Project Controls Manager - No. 1 paper machine rebuild.
- International Paper, Riegelwood, NC - Project Controls Manager - Cluster Rules compliance project.
- Great Lakes Pulp & Fiber, Menominee, MI - Project Controls Manager - New Drinking facility.
- International Paper, Mansfield, LA - Project Controls Manager - No. 1 paper machine rebuild.
- St. Joe Paper Co., Port St. Joe, FL - Project Controls Manager - No. 2 paper machine rebuild.
- Timken Bearings, Canton, OH - Project Controls Manager - New bearings facilities.
- Newsprint South Paper Co., Grenada, MS - Project Controls Manager - Project control engineer responsible for cost and scheduling for a grassroots newsprint paper mill.
- Great Southern Paper Co., Cedar Springs, GA - Project Controls Manager - Planned and scheduled retrofit of Nos. 1, 2, and 3 paper machines.
- Great Northern Paper, Nekoosa Corp. - Project Controls Manager - Lead planner-scheduler for 41 projects in seven locations, including retrofits and major expansions of pulp and paper mills.
- SD Warren Co., Muskegon, MI - Project Controls Manager - Master planner Lead Development and maintain Overall Construction Schedule – Emergency Response Team - Following Fire at Coater caused significant damage to PM building.
- SD Warren Co., Muskegon, MI - Project Controls Manager - Construction management for a new power boiler; field resident engineer.
- Great Lakes Pulp & Fiber, Menominee, MI - Project Controls Manager - New Recycle facility.
- Union Camp Corp., Franklin, VA - Project Controls Manager - Recycle facility.
- Post Cereal, Jonesboro, AR - Project Controls Manager - Major plant expansion to install two complete process/packaging lines.
- General Foods, USA, Tarrytown, NY - Project Controls Manager - Alliance with General Foods; included work at various foods plants.
- Bowater Southern Paper Co., Calhoun, TN – Planner/Scheduler/Cost - Engineering/construction for No. 1 paper machine rebuild. Responsible for development and implementation of master project schedule and detail schedule for major 29-day shutdown of a newsprint machine, including a detail time-scaled CPM schedule of 1000 activities for the 24 hour/day, 29-day schedule.
- SD Warren Co., Skowhegan, ME - Planner/Scheduler/Cost - Construction for No. 1 paper machine at Somerset mill. Responsible for setting up material and labor cost reports.
- Mead Corp., Escanaba, MI - Planner/Scheduler/Cost - Mill outage and shutdown; scheduling engineer.

- Monsanto Chemical Co., Pensacola, FL – Planner/Scheduler/Cost - Distributed controls revamp project.
- Bowater Southern Paper Co., Calhoun, TN - Planner/Scheduler/Cost - Construction management services for No. 1 recovery boiler rebuild.
- Tennessee Valley Authority, Murphy Hill, AL - Planner/Scheduler/Cost - Assistance in developing a comprehensive proposal for construction management services for a commercial-scale coal-to-methanol project.
- International Coal Refining Co., Newman, KY - Planner/Scheduler/Cost - Engineering of utilities and off sites for solvent-refined coal demonstration plant. Responsible for compiling and developing information for engineering estimates; prepared estimate for travel and associated expenses for the duration of the project; maintained computer database in accordance with C/SCSC.
- Aluminum Co. of America, Alcoa, TN - Contracts Administrator - Construction management services for a new cold rolling mill facility. Responsible for subcontractor bid package from preparation to contract award; daily administration of construction activities with contractors' supervision, quantity take-offs, tracking of quantities in-place, review and approval of monthly billing, and interpretation of contract documents and drawings.
- Bowater Southern Paper Co., Calhoun, TN - Subcontracts Administrator/Scheduling Engineer - Engineering/construction for thermomechanical pulping (TMP) facility and No. 2 paper machine rebuild. Responsible for administration of siding, build-up roofing, painting, and insulation contractors, including responsibility for bid package preparation, administration of construction activities and coordination with contractors and direct-hire crafts. Developed and implemented master project schedules, detail system schedules, and start-up schedules using CPM methods.
- Bowater Southern Paper Co., Calhoun, TN - Scheduling Engineer/Safety Supervisor/Start-up Coordinator - Coal conversion project. Developed and implemented master project and detail system schedules using CPM methods, responsible for on-site safety inspections, implementation of safety programs, safety instructional meetings, and investigation of accidents. As start-up coordinator, worked with engineers to coordinate between construction and start-up assistance requirements.
- Union Carbide Corp., Oak Ridge, TN - Cost Engineer - Controlled and monitored material and labor costs; estimated field change orders, tracked quantities in place from the field; coded material requisitions. Specialized in field change orders; checked estimates for accuracy before computer input.
- Fluor Corp., Irvine, CA - Cost Engineer - Petrochemical complex in Al Jubail, Saudi Arabia. Responsible for processing scope changes and trends on a 656,000-MTA ethylene plant and 281,000-MTA crude industrial ethanol plant; also responsible for preparation of Saudi Arabian jobsite and modular fabrication yards, located in Japan, and field progress reporting systems.

Software and Training

- Primavera P6 -

13.9 William "Bill" Johnson

Project Manager

Summary

EPC Project Manager and Project Controls Manager with over twenty-four years' experience in the Pulp and Paper and Industrial markets with focus in Engineering, Safety, and Construction management. Expertise includes scoping, change management, key project indications, value engineering, cost and schedule tracking, and lifecycle project planning. Expertise includes managing programs of projects for clients and leading the project controls effort on projects up to $500MM TIC. Expertise in industrial process and ventilation air systems

Experience

Hargrove Engineers + Constructors – Birmingham, AL
Project Manager / Project Controls Manager

- Responsible for supervision and technical direction over a team of project controls professionals.
- Provide detailed engineering schedules, logically tied, resource loaded and critical path management
- Provide cost management and earned value analysis for all projects in the Birmingham office
- Led / supported small to midlevel projects for Hunt, Olin, Southern Company, Westlake, Georgia Pacific, Greif, and PowerSouth.
- Set up and maintained High Value Engineering (HVE) budget and cost for all projects utilizing HVE support.

Engineering Consulting Firm – Birmingham, AL
Project Manger

- Responsible for all phases of planning and execution on pulp and paper engineering projects
- Responsibilities included managing multiple engineering disciplines, overall planning throughout the project lifecycle, contracting strategy development, cost and schedule tracking, managing construction contractors, project execution plan development, quality review, and safety atmosphere among other important roles and responsibilities
- Worked with the International Paper Regional Engineering Office, (REO).
- International Paper, Pensacola, FL Pulp mill
- International Paper, Cedar Rapids, IA
  - After a fire in the OCC Warehouse, defined the scope and schedule for the roof replacement as well as several fire mitigations projects, TIC 6.5MM.
- International Paper, Newport, IN
  - Winder drive replacement
- International Paper, Henderson, KY

- Managed detail engineering for new winder trim and safety system. Also asked by IP to be the mill's project manager for this project. TIC $6 MM.
- Assumed the project management role on multiple projects during detail design consisting of a Freeness Tester, Trim
- Squirt System, Felt Cleaning Shower, Press Doctor, Press Steam Box, Flue Gas Heat Exchanger and Boiler Feedwater Pumps.
- Worked with Georgia Pacific Company as part of a master services agreement.

- Georgia Pacific, Cedar Springs, GA
  - Managed projects in various study phases for Water
  - Reservoir Replacement, New Water Softener, and Soap System.
- Georgia Pacific, Perry, FL
  - Managed detail engineering for a new line 3 Bale Press to improve bale density and size consistency with a TIC of $4.5MM
  - Managed detail engineering for No. 1 and No. 2 Bark Boiler
  - MACT dual fuel conversion, bark dryer bypass, air to water economizer and burner management system (BMS) implementation with a TIC $22.5MM.
  - Assumed the project management role halfway through the Line 1 Brown Stock Washer project consisting of the addition of 4th & 5th stage washers and new filtrate tank with a TIC of $17.4MM.
  - Managed projects in various study phases for Water
  - Reservoir Replacement, New Water Softener, and Soap System.
  - Worked with Saudi Paper Manufacturing Company as part of a mill capital project renovation.
- Saudi Paper, Dammam, Saudi Arabia
  - Managed FEL 3 studies for the No. 2 tissue machine rebuild with a TIC of $55MM and No. 4 tissue machine upgrade with a TIC of $6.2MM and travel to Dammam, Saudi Arabia to present them to the client

Senior Estimator

- Responsible for calculating estimates by using processes, labor availability and productivity, and material prices, based on historical data. Tabulated cost studies, cash flows and prospect analysis master schedule
- Estimated all engineering and construction indirect cost for all EPC estimates.

Engineering Project Controls – Cost/Scheduling

- Responsible for coordinating the identification of the required activities to be performed by each discipline participating in the execution of the project.
- Responsible for engineering earned value system maintenance and reporting, engineering cost reporting, equipment cost reporting, cost performance curves and total project cost reporting
- RockTenn Paper Company, Hodge, LA
  - Engineer, procure, and construct (EPC) of the paper machine and pulp mill areas by performing a capacity increase on both paper machine 5 & 6, the installation of a new OCC plant, and a rebuild of the continuous digester; TIC of $90MM.
- Olin Chlor Alkali Products, Augusta, GA

  - Engineer, procure, and construct modernization of a chloralkali facility, using state of the art membrane technology, to the requested capacity of 200 MTPD of chlorine, with a TIC of $30MM.
- ILIM Group, St. Petersburg, Russia
  - Engineer, procure, and construct modernization of three pulp and paper mills and expand their capacities by 25% at a TIC of $1.5 Billion. Served as project controls manager for the U.S. office while communicating with our affiliate office and Russian HVE engineering office.
- Mascoma Corp., Lebanon, NH
  - Engineer, procure, and construct Mascoma's first commercial plant, MASCOMETH1, with a TIC of $500MM. The plant will have a nominal production capacity of 20,000,000 gpy of denatured ethanol based on 700 BDMT/D of hardwood chip feedstock. Responsible for engineering scheduling and earned value.
- Georgia-Pacific Corp, Port Hudson, LA
  - Construct tissue machine rebuild of Georgia-Pacific's proprietary "E-TAD" technology, with a TIC of $18MM.
- International Paper, Memphis, TN
  - Lead Cost for International Paper REO. Handled all projects set up / close outs, change orders, cost reporting and analysis for 13 different Mills. Also set up cost structure for HVE support

JHK Systems Inc – Birmingham, AL
Engineering Manager / Vice President

- JHK Systems is a mechanical engineering firm, primarily selling industrial process and ventilation air systems to the pulp and paper industry throughout the United States and South America.
- Managed an engineering department of approximately 15 designers / draftsmen
- Managed multiple projects simultaneously from inception to completion.
- Ensured overall project safety program was within compliance with all regulatory requirements.
- Responsible for calling on customers and prospects, offering total design, engineering, fabrication, and turnkey installation services to the pulp and paper industry
- Developed bids, coordinated proposals, and made sales presentations.
- Paper Machine Hoods
- Aluminum 3" tongue and groove panel with tending side cylinder lift doors and drive side slide doors, designed for a 700-800 grain pickup
- Enclosed hoods can reduce steam usage to the dryers, assist in leveling the profile, and improved operating comfort conditions at several Rittman Paper Board, Boise Cascade, Norampac, International Paper, Champion Paper, PCA, Fitchburg Paper, and Corrugated Services mills.
- Heat Recovery
- Utilized hood exhaust or package boiler exhaust through air-to-air or air-to-water economizers to preheat water or air to reduce the amount of energy required to produce steam at several Visy Paper, Augusta Newsprint, Corrugated Services,

Weyerhaeuser, and Jefferson Smurfit mills. Brown Stock Washer Hoods*Fiberglass or stainless-steel low-flow washer hoods for Cluster rule

- Completed with butterfly access doors with air over oil cylinder for complete access to the washer drum at Green Bay Packaging, Donohue, Alabama River, MeadWestvaco, and Jefferson Smurfit Corporation.
- Dust collection headers installed on key points of the machine between the Yankee dryer and winder to reduce dust in the building and on the product at Erving Industries, Irving Tissue, and International Paper.
- Former exhaust systems installed on vat formers to increase production by providing a more even suction across the roll at several U.S. Gypsum locations.
- Trim systems are used to convey trim from the winder to the wet or dry end pulpers, repulped, or bailer, eliminating the need for producing butt rolls and forklifting rolls to the pulper at Gulf States, Georgia-Pacific, Rand Whitney, Corrugated Services, RockTenn, E.B. Eddy, International Paper, Wausau-Mosinee, Weyerhaeuser, Visy Paper, Michigan Paper, and Mosinee
- Evaluated the building, developed an air balance, and installed air systems to maintain building balance to reduce humidity and improve personnel comfort at International Paper, Appleton Paper, Gulf States, Boise Cascade, Corrugated Services, Champion Paper, Weyerhaeuser, RockTenn, Visy Paper, Jefferson Smurfit Corp., Garden State, Georgia-Pacific, Potlatch, Champion International, and MidAmerican Energy

Software and Training

- Microsoft Office Suite
- Mas 90
- JD Edwards
- AutoCAD
- AutoCAD Mechanical
- SAP
- Deltek Vision
- Adobe Pro
- BlueBeam
- Primavera P6

13.10 Scott Cooper

Project Director

Summary

Over thirty years of extensive experience in the management of engineering projects. Experienced in the process chemical, pulp and paper, automotive, hydro-electric, and aircraft industries. Thirty years of experience working in project management and design engineering. Has had responsibility for safety in design and completion of all other assigned contractual responsibilities within budget and on schedule. Has established project procedures, coordinates changes in scope, reports status of project to the client, monitors and controls engineering activities, cost analysis, planning, scheduling, estimating, procurement, and expediting of process equipment. In addition, manages appropriations grade estimates utilizing the front-end loading (FEL) processes.

Education

Bachelor of Science, Mechanical Engineering

University of Alabama – Birmingham, AL

Professional Certifications

Occupational Safety Councils of America (OSCA) Certified

Process safety management (PSM)

Six Sigma Black Belt

Six Sigma Green Belt

TWIC

Professional Memberships

Chlorine Institute

Experience

Hargrove Engineers + Constructors – Birmingham, AL
Project Director

Responsible for supervision and technical direction over a team of engineers and designers engaged in the total delivery of the services on time, within performance budget and quality expectations. Representative projects include:

- Olin Chlor Alkali, 675 to 940 Expansion, St. Gabriel, LA – TIC $120MM Engineering service. As Project Manager, executed FEL-1 & 2 to expand the St. Gabriel Plant from 675 to 940 SMTPD chlorine production. This required development of a Scope of Work to satisfy the requirements of the 940 SMTPD production.
- Olin Chlor Alkali, R4A Rectifier Replacement, Plaquemine, LA – TIC $10MM Engineering service. Project Manager responsible for the execution of FEL-3 & detail design for a project to replace the Olin Plaquemine Rectifier R4, the replacement unit being designated as Rectifier MET R4A. Olin purchased the rectifier unit under a

separate project. This project provided FEL-3/DD engineering services for the infrastructure and facilities that were required to install the new MET R4A Rectifier.

- Olin Chlor Alkali, #9 & 10 Rectifier Replacement Charleston, TN – TIC $15MM Engineering Services. Project Manager. Execution of a FEL-3 Engineering Services in support of the replacement and installation of #9 & #10 Rectifier and infrastructure modifications.

K2 Pure Solutions – Pittsburg, CA

Project Manager

- K2 Pure Solutions, Chlor-Alkali Brine Treatment Retrofit, Pittsburg, CA – TIC $20MM EPCm Services. The plant was experiencing issues with brine quality. Hargrove executed a process design that mitigated the issue. The project include detail design and construction management.

K2 Pure Solutions – Pittsburg, CA

Engineering Manager

- K2 Pure Solutions, Chlor-Alkali Plant Expansion, Pittsburg, CA – TIC $40MM EPC Services. The plant was designed to manufacture hydrochloric acid, bleach, sodium hydroxide, and liquid chlorine. The expansion took the plant from 200 MTPD to 300 MTPD chlorine. The addition included new electrolyzer, brine filters, IX bed, caustic evaporation system, HCL burner, Bleach production with hypo destruct system and cooling tower. The expansion required several intricately coordinated outages to support the final conversion to the expanded rate. The expanded capacity was online in 4Q 2017, within budget and schedule.

Olin Chlor-Alkali Products – Charleston, TN

Engineering Manager

- Olin, Cell Manufacturing Facility, Charleston, TN – TIC $178MM. Provided engineering manager for a new state-of-the-art membrane cell manufacturing facility that converts 260,000 tons of mercury cell capacity at the Olin Chlor-Alkali Charleston facility. The new facility was targeted to produce the highest quality chlorine, caustic soda and related products and have a new capacity of 200,000 tons, including an expansion of the plant's production of potassium hydroxide (KOH). The technology change was projected to allow the plant to meet the growing need for KOH that is important to the production of food, fertilizers, herbicides, soaps, detergents, airplane de-icing fluids and other key products. After installation of the new technology at the Charleston plant in 2012, mercury was not a component of the manufacturing process resulting in a positive impact to the local environment.

Olin Chlor-Alkali Products – St. Gabriel, LA

Engineering Manager

- Olin, St. Gabriel Facility Expansion, St. Gabriel, LA – TIC $175M. Provided engineering and procurement. Scope included the increase chlorine production from 540 MTPD to a nominal 675 MTPD expandable to 940 MTPD chlorine. This retrofit converted the plant from a mercury cell technology to a membrane technology, which had a positive environmental impact to the local community. The St. Gabriel facility utilized chlorine as the product with sodium hydroxide (NaOH) and hydrogen as co- products. Chlorine will be liquefied, stored, and shipped. Additional compression and liquefaction equipment had been added as a result of this project, but all storage and shipping facilities were adequate without further expansion.

U.S. Magnesium – Rowley, UT

- Magnesium Facility Expansion, Rowley, UT – TIC $50M. Provided engineering and procurement. This expansion increased chlorine production from 35,000 lb/hr to 70,000 lb/hr. The increase impacted existing chlorine gas cleaning, drying, purification, compression, and liquefaction systems. This project required the addition of a new chlorine compressor, wash towers, acid drying towers, and wet/dry brink mist elimination system.

Olin Chlor-Alkali – Augusta, GA

Engineering Manager

- Olin, Mercury Cell Technology Conversion, Augusta, GA – TIC $40MM. Performed engineering and procurement of the Olin facility in Augusta Georgia. The Scope of Work involved conversion of the mercury cell technology with a capacity of 330 short tons per day to membrane technology with a capacity of 200 MTPD. The plant was configured to eliminate the storage and shipment of liquid chlorine. Main products from the plant were hydrochloric acid (HCl) and bleach serving local markets. Caustic was not concentrated but sold as 32% (or diluted as required) to local customers. Hydrogen was used to make HCl and as make up fuel to the boiler. There were no capacity changes in the bleach or HCl units, which are currently rated for 100 gpm (200 gpl) and 60 MTPD HCl operating in two units.

SCE&G – Columbia, SC

Engineering Manager

- Saluda, Dam Remediation, Columbia, SC – TIC $250MM. Provided engineering and procurement of a dam remediation project for a 250-megawatt hydro-electric facility located near Columbia, South Carolina on Lake Murray. Due to the advancement of seismic evaluation technology, it was determined that the existing earthen dam could not sustain an earthquake. Scope of Work included the design assist of a 1.3M cubic yard roller compacted concrete (approx. 1.5 miles long). Performed design and

procurement of all drainage systems to support the new runoff flows from the new structure, new baghouse, several sediment ponds to handle the new ash flows, and modifications to the existing turbine- generator.

Rand Whitney – Montville, CT

Engineering Manager

Assistant Construction Project Manager

- 435 MTPD Recycle Linerboard Facility – TIC $100M. Provided engineering, procurement, and construction management. The project included a new 500 MTPD OCC plant and warehouse, stock preparation, a new paper machine with Bel Bond and extended nip press, and new winder, roll handling and finishing, and a finished product warehouse.

Carter Holt Harvey – Tokoroa, New Zealand

Mechanical Design Leader

- Kinleith Mill Modernization Project – Upgraded the woodyard, pulp mill, and pulp machine areas. Managed mechanical engineering team through the project design.

Westvaco – Covington, VA

Mechanical Discipline Leader

- New #2 Paper Machine – Served as Mechanical design leader for dry end of new #2 paper machine. Supervised all mechanical engineering which includes pump calculations, P&ID development, and equipment layout, piping detail design and piping stress analysis.

13.11 Greg R. Blankenship, PE

Vice President – Eastern Divisional Operations

Summary

Over thirty years of experience in design engineering and project management primarily in the Pulp and Paper industry. Expertise and knowledge include all areas of an integrated Pulp and Paper mill with emphasis on woodyard, chemical pulping, bleach plant, recovery boilers, paper machines, and roll handling. Additional expertise includes fiberglass mat process equipment and packaging, power and process piping systems, machine design, hydraulics, HVAC, and material handling. Over seventeen years of management experience. Managed start-up of consultant firm and grew to 15-person team. Managed 16-man onsite engineering team to execute capital projects. Direct management of a 70-person multi-discipline engineering/consulting office in Decatur and Regional Manager of five other multi-discipline offices in TN, GA, SC and PA.

Education

Bachelor of Science, Mechanical Engineering

University of Alabama – Tuscaloosa, AL

Professional Certifications

Professional Engineer, Alabama # 23085

Professional Engineer, Ohio # 80331

Experience

Hargrove Engineers + Constructors – Decatur, AL
Vice President – Eastern Divisional Operations

Operations Leader / Senior Project Manager

Responsible for overall operations and P&L for Eastern Division – Decatur, Memphis, Atlanta, Savannah, Greenville, and Philadelphia.

- Responsible for leading the Decatur office, serving as project sponsor and relationship manager for North Alabama clients, and ensuring Hargrove's projects are executed successfully
- Tissue Machine Upgrade – Served as Project Manager and Mechanical Lead for Tissue Machine Upgrade Project that included stock screening, cleaning, two new additives, and machine showers
- Fiberglass Mat Machine Rebuild – Project Manager responsible for rebuild that included replacement of the former section, thin stock system, applicator and weir, dryer, winder, roll handling, new fiber feed, binder mix, and machine utilities.
- Chemical Plant Piping Upgrade – Project Manager on various piping projects
- New Tissue Converting Line – Project Manager responsible for new tissue/towel converting line including unwind, embosser, accumulator, log saw, wrapper, carton packer, palletizer, dust collection, trim handling, and glue make-down station

International Paper Company – Courtland, AL
Capital Project Manager

- Managed FEL studies for new 3,000 MTPD Woodyard project

- Designed new mill water pumping system for energy savings
- Upgraded lamb roll lowerator from a hydraulic drive to an electric drive
- Developed project to replace the hardwood digester's steaming vessel

Engineering Consulting Firm – Birmingham, AL
Project Manager, Site Lead at Courland Mill

- Managed on-site team of engineers, designers, and construction managers to support the client's capital plan and maintenance issues
- Replacement Alstom Steam Turbine controls and upgrade MCC/Control Room to IP's ERAC Standard
- FEL-1 study to add 3,000MTPD woodyard—A series of projects to improve hardwood continuous digester which included new extraction screens, third wash extraction screens/header, third lower cooking extraction screens/header, new flash tank with extraction controls, and new turpentine condenser
- Multi-year rebuild of the hardwood bleach plant from two independent 3-stage bleach lines with diffusion and drum washers to a single 3-stage bleach plant with press washers
- Addition of two chlorine dioxide mixers for the hardwood DO and D1 stages. Relocation of roll wrap line from the Franklin Mill to C35 complex
- Upgraded the dryer bearing lube oil system for C30
- Replaced diesel firewater pump and controls

Engineering Consulting Firm – Athens, AL
President Principal Partner

- Worked with other partners to grow Civil/Mechanical engineering firm from 4 employees to 15 employees and $1.6MM in sales. Developed accounts for 21 clients. Key projects include the following:
- International Paper – Courtland
  - Replace the Softwood Oxygen Reactor
  - DiamondRoll Chip Thickness Screens (hardwood and softwood)
  - Hardwood Primary and Secondary Knotter Replacement
  - No. 3 Lime Kiln Chain Section and Refractory Modifications
  - Hi-Brite Grade Phase I Modifications
  - 15 Waste Heat/Energy Conservation Projects
  - 1300PSI Recovery Boiler Steam Drum
  - Bleach Plant MC Pumps
  - Tri-Nip Ceramic Center Roll Installation
  - 10 Pocket Cutsize Line upgrade to 325 TDP
  - 12 Vehicle Automated Guided Vehicle system
- Saint-Gobain – Russellville
- Designed modifications to existing winder for 100" dia rolls

Engineering Consulting Firm – Decatur, AL
Senior Engineer

Site manager and lead engineer at International Paper Courtland Mill. Led team of engineers and designers on various on-site projects. Project Manager for steam distribution repairs during the 2002 Cold Mill Outage. This consisted of 350+ tasks during a four-day outage. Other key projects include:

- Waste Heat Recovery Project
- 1,400MTPD conversion of Kamyr Continuous Digester

Champion International Paper / International Paper – Courtland, AL
Project Engineer

- Provided project management and mechanical engineering services for projects in all areas of the Courtland Mill. Designed the capital management portion of the Avantis installation and managed the training for 800+ mill employees
- Project Manager and Lead Mechanical Engineer for the emergency installation of a 750,000 #/hr. boiler with superheater and economizer sections. The new unit was delivered, erected, and tied into the 450psig steam header in 18 days.
- Press Section Steam Boxes No. 33 & No. 35 Paper Machines
- 1250 Ton/Day, Chip Barge Unloading Facility
- Rebuild of 600 MTPD Kamyr Hydraulic Digester for Extended Modified Continuous Cooking
- No. 3 Pulp Mill Expansion Project (Field Engineer Lime Kiln area

14.0 Appendix B – Controls and Automation

15.0 Appendix C – MSA Contract