PROPOSAL PREPARED FOR: | SUBMITTED ON MAY 3, 2019

Blind Slough Hydroelectric Project

PROPOSAL FOR DESIGN IMPROVEMENTS

SUBMITTED TO:

PETERSBURG
ALASKA

McMILLEN JACOBS ASSOCIATES

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NINE MILE DAM SEDIMENT BYPASS SYSTEM D-B IMPROVEMENTS, WA

Avista Utilities

McMillen Jacobs collaborated with Avista to advance the design and schedule and optimized construction costs. We also managed the construction and the diving team and led the startup and commissioning.

McMILLEN JACOBS ASSOCIATES

May 3, 2019

Karl Hagerman
Utility Director
Petersburg Borough
khagerman@petersburgak.gov

Subject: Proposal for Blind Slough Hydroelectric Project Design

Dear Mr. Hagerman:

McMillen Jacobs Associates (McMillen Jacobs) is pleased to submit our proposal for the professional engineering services for the refurbishment of the Blind Slough Hydroelectric Project (Project). We are confident that the McMillen Jacobs' team represents the best company to meet Petersburg Borough (Borough) requirements. With our highly qualified team of hydro professionals and our familiarity with the Project, we will be extremely cost effective at developing the design and construction documents to refurbish the Project. We have organized our proposal to follow the specific outline of tasks presented in the RFP tailoring our approach to highlight our specific qualifications, and address the following:

- Estimate of T&M costs inclusive of all work described below, including all expenses related to the completion of the work.
- A work schedule that clearly describes the calendar dates for starting and completing of each task.
- A listing of staff and resources required to complete the work.
- Special considerations anticipated for completion of the work.

McMillen Jacobs brings a proven track record of delivering complex water resources and hydroelectric projects utilizing a Design-Bid-Build contract delivery mechanism. We are confident of our ability to continue a strong and collaborative working relationship with the Borough providing the effective communication, decision making, and partnership required to move the project from preliminary engineering through to the initiation of commercial power generation. Our proposed team has McMillen Jacobs' staff in every key role—many of which worked on the engineering services for this Project and Capital Improvement Program that this RFP is based on.

Mort McMillen, as the Principal-in-Charge, has the authority to make all executive decisions for McMillen Jacobs providing effective and swift decision making. Mort has served in the same role for the Allison Creek Hydroelectric Design-Build Project working closely with the Copper Valley Electric Authority in managing the project. Their partnership served as the foundation in developing a fully collaborative working relationship within the team, quick response to project issues and challenges, and effective financial management. Through Mort's leadership, we developed a project configuration and construction approach which delivered the project $10 million under the original cost estimate, while also maximizing generation output. Mort McMillen will provide quality assurance and control and be a technical resource for the design team.

Don Jarrett, as the Project Manager, brings over 35-years of hydroelectric project engineering, design, construction and operations experience to the team. Don will provide leadership and oversight of the development of the plans and specifications for both turbine-generator equipment procurement and the on-site construction contract.

Our in-house FERC/regulatory team, led by Cory Warnock, is ideally suited to lead the permitting and FERC consultation/compliance work activities for this Project. Cory has extensive experience with the State of Alaska regulatory agencies and has a successful track record of delivering permits to meet construction timelines, while maintaining exceptional relationships with the agencies. Cory is well respected with FERC and brings experience in managing the FERC compliance on projects in Alaska.

Our team provides the following benefits to the District:

- Our Project Manager, Don Jarrett, has participated in over a dozen refurbishment / construction projects and led the recently completed the $80 million Box Canyon Hydroelectric Turbine Upgrade Project for the Pend Oreille Public Utility District bringing a proven ability to successfully deliver challenging projects on time and within budget.
- Key Team Members bring an average of over 22 years of experience in the industry.
- All of the engineers required to stamp drawings are Registered Professional Engineers in the State of Alaska.
- Every member of our team brings experience that is unique to hydroelectric projects—having completed over 150 projects at hydropower facilities in the last 10 years.
- Customer service is our priority—80% of our work is from repeat clients.
- Key Team Members demonstrate experience in providing support to start-up and commissioning, balance of plant, and integration of the turbine-generator package up to the utility inter-tie point.
- Our multi-disciplined team brings extensive depth to execute hydropower projects such as the Blind Slough Hydroelectric Project.

If you have additional questions, please feel free to call or email us at maramcmillen@mcmjac.com or mortmcmillen@mcmjac.com, or call at (208) 342-4214 or cell at (208) 869-4007 (Mara) (208) 830-1394 (Mort).

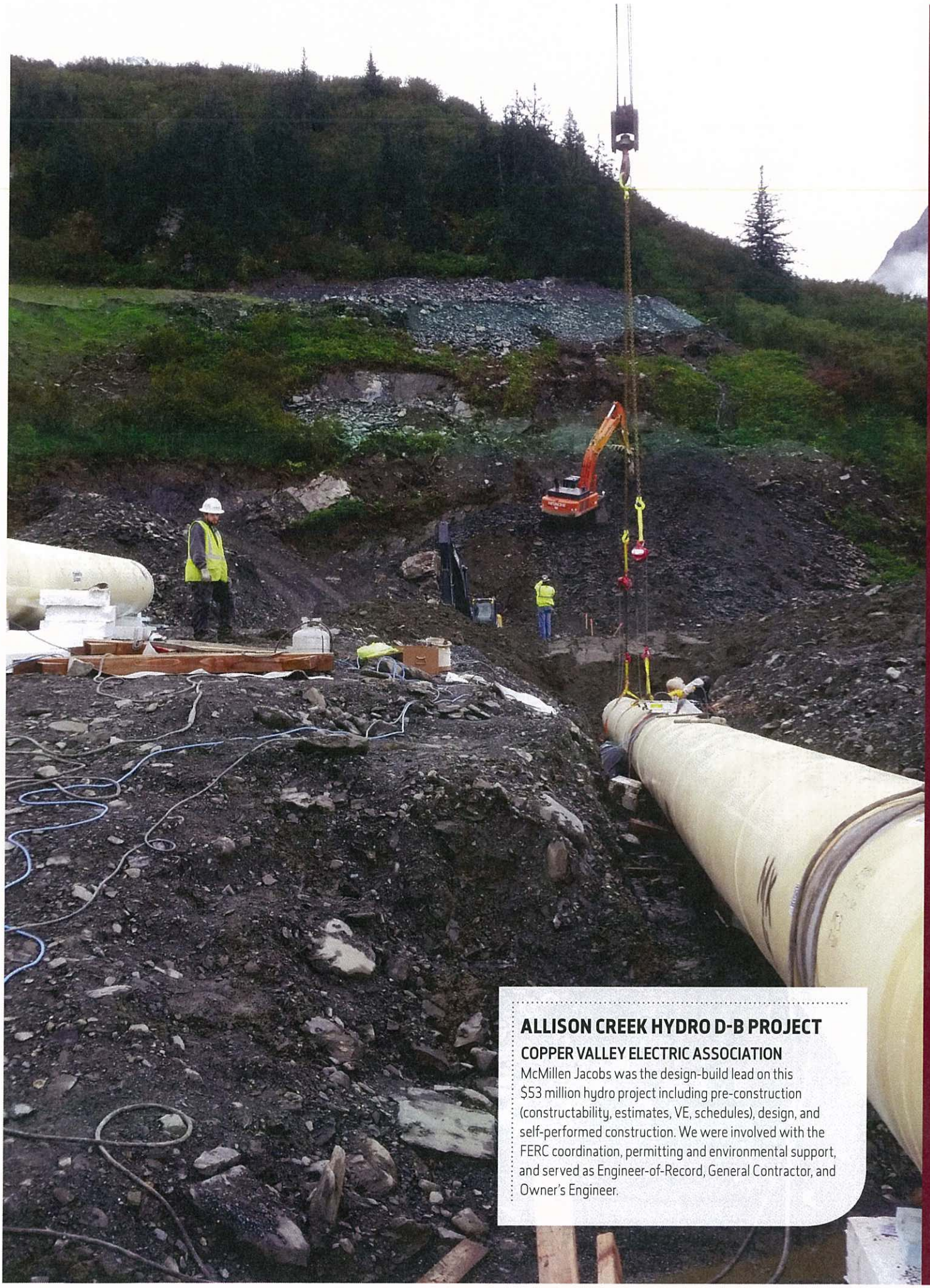
Sincerely,

Mara McMillen

Mara McMillen
President of McMillen LLC,
dba McMillen Jacobs Associates

Morton D. McMillen

Morton D. McMillen, PE
Executive VP of McMillen LLC,
dba McMillen Jacobs Associates



ALLISON CREEK HYDRO D-B PROJECT

COPPER VALLEY ELECTRIC ASSOCIATION

McMillen Jacobs was the design-build lead on this $53 million hydro project including pre-construction (constructability, estimates, VE, schedules), design, and self-performed construction. We were involved with the FERC coordination, permitting and environmental support, and served as Engineer-of-Record, General Contractor, and Owner's Engineer.

1.0 Cost Details

1.1 Scope of Work

McMillen Jacobs Associates (McMillen Jacobs) recently completed our study of the Blind Slough Hydroelectric Project. This work included a Condition Assessment (CA) of the Blind Slough Hydroelectric Project (Project) for the Borough of Petersburg, Municipal Power and Light (Borough). The CA was performed by a multidisciplinary team of professional engineers who used their experience with other hydroelectric facilities and information provided by the Borough to assess the condition of the Project. The Project is generally operating well with a high availability and a low operating cost. Project operations and maintenance (O&M) staff are knowledgeable and have a long association with the Project. The CA concluded with a list of recommendations for work needed to maintain the Project operation for the term of the current Federal Energy Regulatory Commission (FERC) license and future licenses.

McMillen Jacobs was also retained to perform an analysis of alternatives based on the CA results for major maintenance (for life extension) and capital improvements for the Project. The Alternatives Development and Evaluation report documented and evaluated the alternatives developed to recommend major maintenance and capital improvements for the Project.

Finally, McMillen Jacobs prepared a Capital Improvement Plan (CIP) for the Project based on the CA and the evaluation of the alternatives presented in the Alternatives Development and Evaluation Report. The CIP presents the plan for powerhouse refurbishment and penstock repair.

It was recommended that the two projects (powerhouse refurbishment and penstock repair) be combined into a single coordinated construction project to minimize outages and make any modifications to the lower part of the penstock to accommodate a new turbine. A single general contractor should coordinate both activities to minimize outages and schedule conflicts. This construction contract would be awarded through a competitive bidding process. It was also recommended that the Borough procure the turbine-generator and auxiliary electrical equipment directly through a competitive bidding process. This procurement approach will provide the greatest level of control over the equipment to be installed in the powerhouse and provide all necessary information for the design of the powerhouse modifications. This equipment would then be provided to the general contractor for the powerhouse refurbishment. Total costs are estimated at $7.3 million in the CIP. Cost estimates will be updated as the design progresses. This contract schedule will require about 3 years to complete including design, equipment procurement, and construction.

As a part of the CIP, the following tasks were defined:

- **Task 1 Preliminary Engineering**
- **Task 2 Equipment Procurement Bid Documents**
- **Task 3 Equipment Bidding Assistance**
- **Task 4 Equipment Design and Manufacturing Support**
- **Task 5 Engineering for Construction Contract**
- **Task 6 Construction Contract Bidding**
- **Task 7 Engineering Support During Construction**
- **Task 8 Regulatory and Permitting Support**
- **Task 9 Project Management**

Each of these tasks are discussed below. Table 1.1 presents a summary of the costs estimated for each task and a detailed breakdown of costs is located at the end of this section.

Proven Performance
Cost-Effective Designs

"Your value engineering effort saved the project $2.9M or 30% reduction in capital cost. The design-build contract was awarded in December 2010 and was completed 9 months ahead of schedule and within budget. Thank you and your design-build team for the thorough and professional performance. I very much enjoyed working with you all; very high caliber team. McMillen is a most impressive design and construction vendor." - Jim Burby, Retired Project Manager, US Fish & Wildlife Service for the Don Edwards Ponds Design-Build Project.

1.1.1 Task 1- Preliminary Engineering

Preliminary engineering is needed to fully define the final scope of refurbishment work at the Project, collect additional information needed for design, develop plans and specifications for the two contracts (equipment procurement and on-site construction), refine costs, etc. Significant activities needed for the development of the plans and specifications include the inspection of the penstock interior (via remotely operated vehicle and further field inspections) and a detailed topographic survey of the penstock (to provide as-built information on the penstock features, slopes for access improvements, etc.). The survey will facilitate McMillen Jacobs' work in developing detailed drawings for repair of the penstock and improvements to the penstock access. We will manage these investigation activities in collaboration with the Borough. We have included preliminary costs for these investigations but do not have firm price proposals at this time.

An important part of the penstock repair work includes improvements to access to the penstock for the repair work and future maintenance activities. This may be achieved by performing additional clearing along the penstock right-of-way to provide improved access—possibly for an all-terrain vehicle. Additionally, it may be feasible to add walk ways to the penstock in steep and elevated sections. We will work closely with the Borough to develop these improvements during preliminary engineering. Our construction group will assist with cost review of these improvements to ensure we are able to stay within the budget for the penstock repair work.

As noted in the previous studies, McMillen Jacobs has recommended complete equipment replacement inside the powerhouse. Based on information received from contractors and manufacturers and our investigations and analysis, a two-jet horizontal impulse turbine directly coupled to a generator with brushless excitation is the most cost-effective replacement. The equipment package will also include a new governor, controls, protective relays, generator switchgear, and other electrical equipment. The equipment procurement contract will be bid and awarded in the first half of 2020, and equipment will be delivered to the site in early 2022.

A second contract will be developed for the demolition of the existing powerhouse equipment and installation of the new equipment as well as penstock repairs. This contract will be able to utilize manufacturer information from the equipment procurement contract. This construction contract will be bid in late 2021 and awarded in 2022. Construction work would occur during the summer of 2022 and the Project would begin generating with the new equipment and the repaired penstock in the Fall of 2022.

The plans and specifications developed in preliminary engineering phase (Task 1) will represent 60% level of design. These documents will be suitable for consultation with FERC and involved agencies to describe the work to be performed and make preliminary filings for regulatory approvals (as needed). In subsequent tasks (Task 2 – Equipment Procurement Bid Documents and Task 5 – Engineering for Construction Contract) the plans and specifications will be advanced to 90% and then 100% with input from the Borough.

This task will also involve inital consultation with FERC and involved agencies and development of the plans and specifications for their approval. Consultation with Southern Southeast Regional Aquaculture Association (SSRAA) concerning how to best provide the hatchery with water during penstock repairs will be required. Based on our discussions with Loren Thompson with SSRRA, we believe that a collaborative relationship can be

established with SSRA to arrive at an optimum solution. The requirements for hatchery water are not known at this time, and the method and quantity of these flows need to be finalized. McMillen Jacobs will assist the Borough with coordination and/or required filings with SSRAA, appropriate agencies, and FERC. During the FERC relicensing process (resulting in a new license in 2003), Alaska Fish and Game, the U.S. Department of Interior, and the National Marine Fisheries Service were intervenors. It is not known what level of consultation will be required for this refurbishment. Initial consultation with these involved agencies will better inform the Borough as to their concerns.

Furthermore, the refurbishment of the Project may trigger an amendment to the FERC license. The existing FERC license includes the generating units in both powerhouses and decommissioning of the old 400 kW unit is recommended (unit not safe to operate). Because the installation of a new two-jet turbine with approximately 2000 kW capacity changes the description of the equipment as currently licensed, a FERC amendment may be required. This issue will need to be resolved through consultation with FERC.

Our proposal includes an allowance for consultation and submittal of pre-construction plans and specifications to FERC and the involved agencies, however, it is not known what, if any, requirements may result from consultation, and as such, we cannot guarantee the proposed level of effort will be adequate. If the level of effort is more than that in the budget, we will solicit a change order.

1.1.2 Task 2- Equipment Procurement Bid Documents

This task involves the preparation of bid documents for the Borough to purchase turbine, generator, and ancillary electrical equipment. As was discussed in the CIP, McMillen Jacobs recommends the Borough purchase all new powerhouse generating equipment. Plans and specifications will be prepared to allow a competitive bid process for the supply of the equipment. A preliminary list of specifications and drawings that will be prepared for the equipment procurement bid documents is presented in the Appendix. McMillen Jacobs' staff will work closely with the Borough to make sure the plans and specifications will provide equipment that will provide a long life with efficient use of the water and guarantees ensuring the performance claimed by the bidder.

As noted in the CIP, we recommended procurement of a new two-jet impulse turbine, turbine inlet valve and hydraulic power unit and governor, new brushless excited synchronous generator, new generator switchgear, breaker controls, and protective relays. The selected manufacturer will provide submittals demonstrating that the equipment is in conformance with the specifications and receives appropriate factory acceptance tests prior to shipment. The supplier will also provide detailed drawings of the equipment, installation instructions, and field service engineers to oversee installation, startup, and commissioning.

We have prepared a preliminary list of plans and specifications that will be used for the equipment procurement. Because McMillen Jacobs has routinely developed these types of procurement contract packages, preparation of the plans and specifications will be performed as quickly as possible to preserve the schedule. The initial plans and specifications for equipment procurement will be developed during Task 1 to allow time for the Borough to review and comment. The plans and specifications will be finalized during Task 2 to enable issuance in a timely manner.

Proven Performance
Innovative Designs

"McMillen Jacobs has always been professional and supportive to the PUD as the Design Engineer and EOR [Engineer-of-Record] for the various projects...the owner, McMillen Jacobs, and the General Contractor worked together to redesign the project from a pumped system to a gravity system, saving the district over $2M in construction costs and a large reduction in ongoing operational costs. McMillen Jacobs has been open to changes and quick to review submittals and RFIs. I would highly recommend McMillen Jacobs for any similar project as they bring the experience and have the staffing to design, manage, and build large, complex projects. -- Mark Cleveland, Director of Power Productions Pend Oreille County PUD (re: Box Canyon Dam)

1.1.3 Task 3- Equipment Bidding Assistance

This task will involve finalization of the equipment procurement bid documents. McMillen Jacobs will assist the Borough in soliciting bids, responding to bidder questions, issuing addenda when appropriate, attending a pre-bid meeting in Petersburg, evaluating the bids, and making a recommendation for award. We have already solicited budgetary proposals from several manufacturers (including Voith Hydro, Mavel, Canyon Hydro, Global Hydro and Gilkes Hydro) and expects that there will be a very robust response to the request for bids.

1.1.4 Task 4- Equipment Design and Manufacturing Support

During the design and manufacturing of the powerhouse equipment, McMillen Jacobs will support the Borough with a kickoff meeting, design coordination meetings, submittal reviews, and witness of factory acceptance tests (FAT). For overseas FAT, we propose to utilize the services of a third-party inspector. We have routinely utilized Brazil Quality Services (BQS) for these inspection services as a cost-effective alternative to expensive overseas trips.

Submittal reviews are an important method to ensuring the equipment is being manufactured in accordance with the level of quality required by the specifications. The manufacturer will be required to submit material test reports to verify materials are provided and tested in accordance with the specifications. The specifications will require various non-destructive testing methods to verify quality requirements are being satisfied.

Submittals will be provided not just for the turbine and generator, but all equipment being supplied. Important submittals will include control schematics and control logic narratives provided by the control's integrator. The specifications will require these submittals to address start-stop logic and capabilities for remote and local control of the turbine-generator. The PLC logic will be required to provide for all specified start-stop and load control logic. Trip and alarm logic will be carefully reviewed to verify that proper equipment protection is being provided as required by the specifications.

1.1.5 Task 5- Engineering for Construction Contract

This task will involve the development of the bid documents for the on-site construction work. This contract will involve the demolition and removal of the existing powerhouse equipment as well as the penstock repair and the installation, startup and commissioning of the new equipment. While preliminary plans and specifications will have been developed during the preliminary engineering task, new information will become available from the equipment manufacturer that needs to be added and will modify some of the drawings previously developed. We will provide intermediate plans and specifications to the Borough for review and then finalize the plans and specifications.

1.1.6 Task 6- Construction Contract Bidding

McMillen Jacobs will assist the Borough with bid advertisement and issuance of bid documents to prospective bidders. As a part of this task we will review and respond to all material questions from bidders as well as facilitate and lead a pre-bid meeting in Petersburg. Finally, we will evaluate the bids and recommend an award to the Borough. We have already solicited budgetary proposals from several contractors and expect that there will be strong interest from contractors to pursue this contract. We anticipate that bidders will need several months to prepare a bid for the work. Prior to issuing a notice to proceed to the selected contractor the Borough will need to have received FERC approvals for construction.

1.1.7 Task 7- Engineering Support During Construction

As a part of this task McMillen Jacobs will:

a. Lead Pre-construction meeting in Petersburg with construction contractor and Borough.
b. Assist Borough with communications and coordination with Crystal Lake Hatchery regarding water supply requirements.
c. Provide on-site construction oversight and inspection, including daily inspection reports and monthly progress reports.
d. Lead all progress meetings via teleconference or on-site as required.
e. Review contractor submittals.
f. Review and address all design clarification/verification requests.
g. Prepare change order RFP's as required. Evaluate change order proposals and recommend acceptance or rejection to Borough.

We have budgeted for one of our Resident Project Engineers to oversee the construction contractor's work and provide the documentation for the tasks listed above. As a part of the work, they will monitor construction quality requirements and have third-party quality testing performed (concrete cylinder testing, etc.). All construction monitoring and inspection will be performed in accordance with a Quality Control and Inspection Plan (QCIP) that will be prepared by our staff for review and approval by FERC. The engineer will also verify all Temporary Erosion and Soil Control Plan (TESCP) requirements are being implemented and maintained. The contract documents will include the QCIP and TESCP.

1.1.8 Task 8- Regulatory and Permitting Support

We have included an allowance for support to the Borough for regulatory and permitting support. The level of effort required is not well defined at this time. We believe that there may be some conditions imposed for regulatory compliance related to permits that may be required by the involved agencies. These requirements (if any) will become better defined through the consultation process with FERC. If FERC requires consultation with the involved agencies they may identify monitoring or other requirements.

1.1.9 Task 9- Project Management

This work task consists of the effort required to efficiently manage the project, including coordination meetings, progress reports, invoicing, and other administrative/management needs.

1.2 Cost Summary

Table 1.1 presents a summary of the proposed McMillen Jacobs' costs. A detailed level of effort spreadsheet showing a breakdown of the costs is presented at the end of this section.

Table 1-1. Cost Summary

Task		Cost
1.0 Preliminary Engineering	$	483,321
2.0 Equipment Procurement Documents	$	44,404
3.0 Equipment Bidding Assistance	$	19,910
4.0 Equipment Design/Manufacturing Support	$	155,440
5.0 Engineering for Construction Contract	$	216,741
6.0 Construction Contract Bidding	$	24,038
7.0 Engineering Support During Construction	$	436,736
8.0 Regulatory and Permitting Support	$	28,948
9.0 Project Management	$	29,820
TOTAL	**$**	**1,439,358**

McMILLEN JACOBS ASSOCIATES

Petersburg - Blind Slough Hydro - Project Refurbishment

5/3/2019

Staff	McMillen (PIC)	Jarrett (PM)	Horsczy (Struct)	Carson (Mech)	Lawson (Elect)	Moughamian (Civil)	CAD	Jensen (Hydraulic)	Warnock (Regulatory)	ITR Team	Neubar (Const. Est.)	Foley (Const. Review)	Boing (Proj. Eng. Mech)	Whiton (Editor)	Construction Inspector									
Rates	$ 220	$ 220	$ 135	$ 150	$ 185	$ 203	$ 130	$ 142	$ 168	$ 200	$ 150	$ 200	$ 200	$ 100	$ 175	Hours	Total Labor	Subcontractor	Airfare	Hotel / Car	Meals	Total Expenses	TOTAL
1.0 Preliminary Engineering	16	210	162	170	272	204	437	56	48	32	32	8	168	81	-	1,895	$ 315,921	$ 160,000	$ 5,000	$ 1,800	$ 600	$ 167,400	$ 483,321
Define final refurbishment scope of work (SOW) and design criteria document		8	8	8	8								8			40	$ 7,120					$ -	$ 7,120
Meeting in Petersburg and site visit to review refurbishment SOW and design criteria		16			16	16							16			64	$ 12,928		3000	600	200	$ 3,800	$ 16,728
Unit installed capacity optimization - develop long term reservoir inflows, run generation for several installed capacities of turbine-generator, develop wet/average/dry water year rule curves		8		24				40					8	4		84	$ 13,040					$ -	$ 13,040
Develop preliminary **plans** for powerhouse/penstock refurbishment work. Develop two sets of plans and specifications (equipment procurement and construction contract) for review.	8	60	79	82	164	124	397						63			976	$ 157,531					$ -	$ 157,531
Develop preliminary **specifications** for powerhouse/penstock refurbishment work. Develop two sets of plans and specifications (equipment procurement and construction contract) for review.	4	58	3	23	60	8							53	61		270	$ 46,956					$ -	$ 46,956
Preliminary design documentation report (DDR) & calculations	4	16	16	24	16	16		16						16		124	$ 20,240					$ -	$ 20,240
Determine scope of penstock inspection, procure services & assist		8	24			24											$ 9,872	$ 60,000	1000	600	200	$ 61,800	$ 71,672
Survey of penstock alignment and topography & assist / develop base drawings for penstock		4	24			8	40										$ 10,944	$ 100,000	1000	600	200	$ 101,800	$ 112,744
Define temporary water supply to hatchery during construction work		8							8				8				$ 4,704					$ -	$ 4,704
Develop final project schedule		8															$ 1,760					$ -	$ 1,760
Update construction cost estimate		4									32	8					$ 7,280					$ -	$ 7,280
Assist the Borough with FERC consultation		4							40				4			48	$ 8,400					$ -	$ 8,400
Internal Technical Review (ITR)		8	8	8	8	8				32			8				$ 15,144					$ -	$ 15,144
2.0 Equipment Procurement Documents	16	36	16	28	36	8	24	-	-	-	-	-	64	24	-	252	$ 44,464	$ -	$ -	$ -	$ -	$ -	$ 44,464
Develop Bid Documents (bid forms, general conditions, etc.)	2	8		8	8								8	8		42	$ 7,280					$ -	$ 7,280
Revise drawings	4	8	8	8	8	8	16						16			76	$ 13,304					$ -	$ 13,304
Revise specifications	4	4	4	4	4								16	12		48	$ 8,040					$ -	$ 8,040
Review meeting (conference call)		4		4	4											12	$ 2,220					$ -	$ 2,220
Final Plans	2	2	2	2	2		8						8			26	$ 4,460					$ -	$ 4,460
Final specifications	2	2	2	2	2								8	4		22	$ 3,820					$ -	$ 3,820
Engineers estimate for bid	2	8			8								8			26	$ 5,280					$ -	$ 5,280
3.0 Equipment Bidding Assistance	2	24	2	16	32	-	-	-	-	-	-	-	16	-	-	92	$ 17,510	$ -	$ 2,000	$ 300	$ 100	$ 2,400	$ 19,910
Assist Borough with call for bids		8														8	$ 1,760					$ -	$ 1,760
Attend site job walk for bidders					16								16			32	$ 6,160		2000	300	100	$ 2,400	$ 8,560
Assist Borough with bidder questions		8	2	8	8											26	$ 4,710					$ -	$ 4,710
Evaluate bids and make recommendation for award	2	8		8	8											26	$ 4,880					$ -	$ 4,880
																-	$ -					$ -	$ -
																	$ -					$ -	$ -
4.0 Equipment Design/Manufacturing Support	-	144	-	232	296	-	-	-	-	-	-	-	104	16	-	792	$ 143,640	$ 10,000	$ 1,000	$ 500	$ 300	$ 11,800	$ 155,440
Kick off meeting		16		16	16								16			64	$ 12,080					$ -	$ 12,080
Submittal reviews		40		160	160								40			400	$ 70,400					$ -	$ 70,400
Coordination meetings		40		40	80								40	16		216	$ 39,200					$ -	$ 39,200
Monthly progress reports		40														40	$ 8,800					$ -	$ 8,800
Factory acceptance tests (third party inspection in Europe assumed)		8		16	40								8			72	$ 13,160	$ 10,000	1000	500	300	$ 11,800	$ 24,960
5.0 Engineering for Construction Contract	10	115	153	122	217	156	297	-	-	32	32	8	101	68	-	1,312	$ 216,741	$ -	$ -	$ -	$ -	$ -	$ 216,741
Develop Bid Documents	2	8		8	8	8								8		42	$ 7,304					$ -	$ 7,304
Revise drawings w/ equip. manufacturer information		40	131	55	109	82	265						42			724	$ 114,458					$ -	$ 114,458
Revise specifications with equip. manufacturer information		39	2	16	40	6							35	40		177	$ 30,719					$ -	$ 30,719
Review meeting (conference call)		8	8	8	8	8							8			48	$ 8,744					$ -	$ 8,744
Final Plans	4	4	4	4	4	4	16									40	$ 6,532					$ -	$ 6,532
Final specifications	4	4	4	4	4	4								4		28	$ 4,852					$ -	$ 4,852
Engineers estimate for bid		4									32	8	8			52	$ 8,880					$ -	$ 8,880
Finalize DDR & calculations		4		24	40	40							8	16		132	$ 23,200					$ -	$ 23,200
Internal Technical Review		4	4	4	4	4	16			32						68	$ 12,052					$ -	$ 12,052
6.0 Construction Contract Bidding	2	28	2	16	32	16	-	-	-	-	-	-	16	-	-	112	$ 21,638	$ -	$ 2,000	$ 300	$ 100	$ 2,400	$ 24,038
Assist Borough with call for bids		8														8	$ 1,760					$ -	$ 1,760
Attend site job walk for bidders		4			16	16							16			52	$ 10,288		2000	300	100	$ 2,400	$ 12,688
Assist Borough with bidder questions		8	2	8	8											26	$ 4,710					$ -	$ 4,710
Evaluate bids and make recommendation for award	2	8		8	8											26	$ 4,880					$ -	$ 4,880
7.0 Construction Management	-	192	40	144	332	192	80	-	-	-	-	-	264	-	960	2,204	$ 400,836	$ -	$ 10,000	$ 18,300	$ 7,600	$ 35,900	$ 436,736
Kick off meeting		16			16	16							8			56	$ 11,328		2000	300	100	$ 2,400	$ 13,728
Submittal reviews		24	40	40	140	40							40			324	$ 58,700					$ -	$ 58,700
Coordination meetings		40		40	40	40							40			200	$ 38,320					$ -	$ 38,320
Monthly progress reports		16			16	16							16			64	$ 12,928					$ -	$ 12,928
On-site construction support (one construction inspector for 4 months)		16		40	40	40							40		960	1,136	$ 201,040		4000	14400	6000	$ 24,400	$ 225,440
Startup & commissioning (1 month)		80		24	80	40							80			304	$ 60,120		4000	3600	1500	$ 9,100	$ 69,220
As builts							80						40			120	$ 18,400					$ -	$ 18,400
8.0 Regulatory and Permitting Support	-	16	-	-	-	16	40	-	60	-	-	-	16	-	-	148	$ 25,248	$ -	$ 3,000	$ 500	$ 200	$ 3,700	$ 28,948
FERC and regulatory agency filings/meetings		16				16	40		60				16			148	$ 25,248		3000	500	200	$ 3,700	$ 28,948
9.0 Project Management	16	40	-	-	-	-	-	-	-	-	-	-	40	40	-	136	$ 24,320	$ -	$ 3,000	$ 2,000	$ 500	$ 5,500	$ 29,820
Coordination, meetings, progress reports, invoicing & administrative	16	40											40	40			$ 24,320		3000	2000	500	$ 5,500	$ 29,820
Total Hours	82	805	375	728	1,217	592	878	56	108	64	64	16	789	229	960	6,942							
Total Budget	13,640	176,990	50,571	109,200	225,145	120,176	114,140	7,952	18,144	12,800	9,600	3,200	157,800	22,900	168,000		$ 1,210,258					$ 229,100	$ 1,439,358

BOX CANYON HYDRO FACILITY, WA

Pend Oreille PUD

McMillen Jacobs served as Engineer-of-Record and managed the procurement and installation of generating systems at this 90 MW project. Scope included upgrades to 4 Kaplan units with new runner, stator, rotor spider, governor exciter, control system, and reconditioned rotors and poles. Work also included powerhouse structural modifications, electrical engineering, and FERC/permitting support.

2.0 Schedule

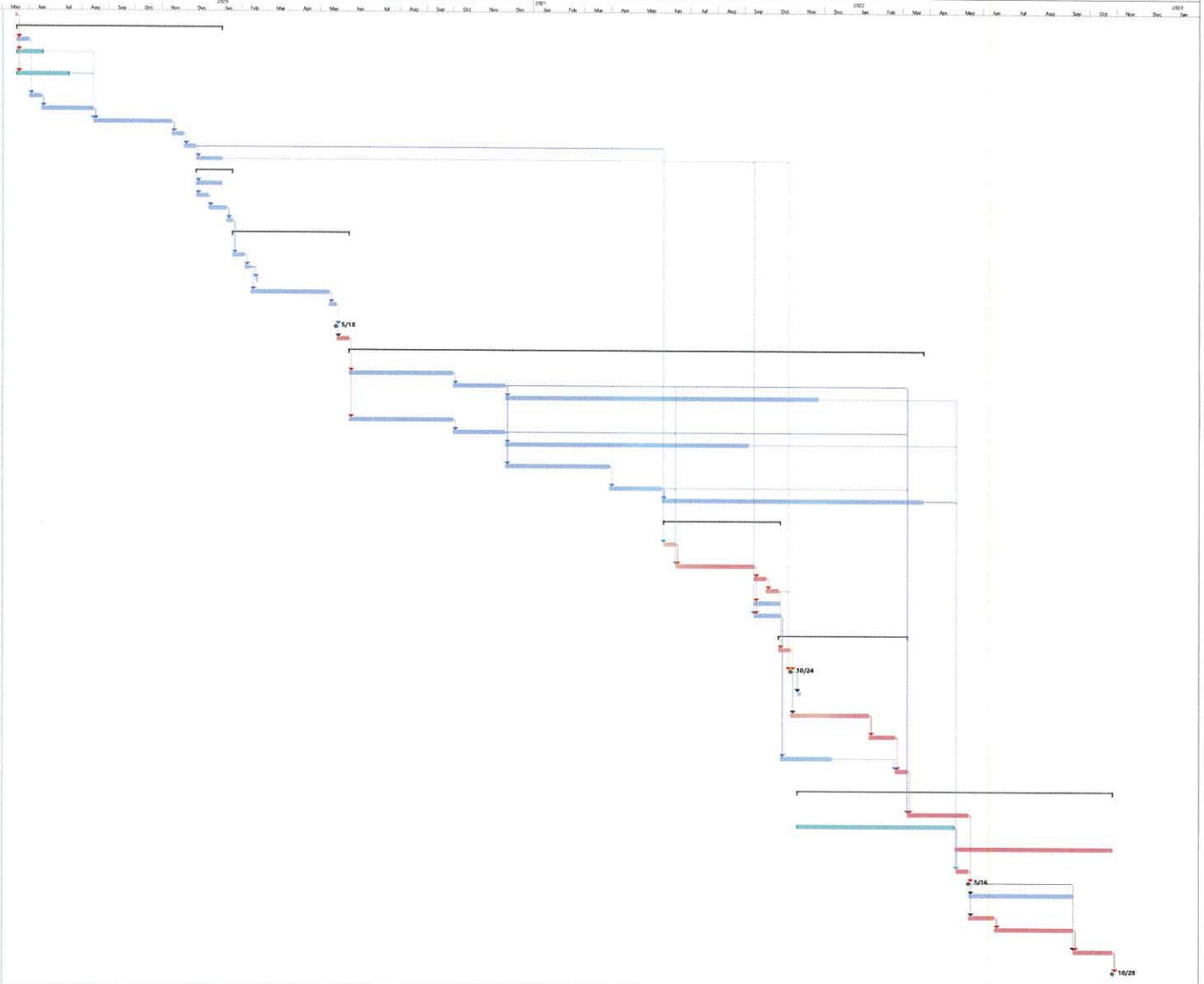
We have developed a detailed schedule for the tasks involved with the refurbishment of the Blind Slough Hydro Project with an anticipated notice-to-proceed to McMillen Jacobs by May 17, 2019. The schedule reflects the predecessor task for each activity, for example, manufacturer submittals required for the development of the construction contract plans and specifications. A detailed Gantt Chart of the schedule is located at the end of this section.

Petersburg Blind Slough

Project Refurbishment Schedule

Capital Improvement Plan

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors
1		**Notice to Proceed**	1 day	Fri 5/17/19	Fri 5/17/19	
2		**Task 1 - Preliminary Engineering**	**168 days**	**Fri 5/17/19**	**Wed 1/8/20**	
3		Define final scope of work	14 edays	Fri 5/17/19	Fri 5/31/19	1
4		Develop scope, procure contractor for ROV inspection & assist	30 edays	Fri 5/17/19	Sun 6/16/19	1
5		Develop scope, procure contractor for penstock survey & assist	60 edays	Fri 5/17/19	Tue 7/16/19	1
6		Design criteria document	14 edays	Fri 5/31/19	Fri 6/14/19	3
7		Optimize unit capacity	60 edays	Fri 6/14/19	Tue 8/13/19	6
8		Plans & Specifications	90 edays	Tue 8/13/19	Mon 11/11/17	4,5
9		Design documentation report	14 edays	Mon 11/11/1	Mon 11/25/18	
10		Borough review and comments	14 edays	Mon 11/25/1	Mon 12/9/19	9
11		FERC & Agency consultation	30 edays	Mon 12/9/19	Wed 1/8/20	10
12		**Task 2 - Equipment Procurement Bid Documents**	**30 days**	**Mon 12/9/19**	**Mon 1/20/2(**	
13		Develop Bid Documents	30 edays	Mon 12/9/19	Wed 1/8/20	10
14		Revise Plans & Specifications	14 edays	Mon 12/9/19	Mon 12/23/1	10
15		Borough review and comments	21 edays	Mon 12/23/1	Mon 1/13/20	14
16		Finalize Plans and Specs	7 edays	Mon 1/13/20	Mon 1/20/20	15
17		**Task 3 -Equipment Procurement Bidding Assistance**	**96 days**	**Mon 1/20/20**	**Wed 6/3/20**	
18		Assist Borough with advertisement	14 edays	Mon 1/20/20	Mon 2/3/20	16
19		Issue Bid Documents	7 edays	Mon 2/3/20	Mon 2/10/20	18
20		Site visit	2 days	Mon 2/17/20	Tue 2/18/20	19
21		Bid date	90 edays	Mon 2/10/20	Sun 5/10/20	19
22		Bid evaluation	8 edays	Sun 5/10/20	Mon 5/18/20	21
23		Award contract at Assembly Meeting	0 days	Mon 5/18/20	Mon 5/18/20	22
24		Issue notice to proceed	14 edays	Wed 5/20/20	Wed 6/3/20	23
25		**Task 4 - Equipment Design/Manufacturing Support**	**472 days**	**Wed 6/3/20**	**Fri 3/25/22**	
26		Turbine vendor design	120 edays	Wed 6/3/20	Thu 10/1/20	24
27		Submittals and approvals	60 edays	Thu 10/1/20	Mon 11/30/2	26
28		Turbine Manufacturing & Delivery	360 edays	Mon 11/30/20	Thu 11/25/21	27
29		Generator vendor design	120 edays	Wed 6/3/20	Thu 10/1/20	24
30		Submittals and approvals	60 edays	Thu 10/1/20	Mon 11/30/2	29
31		Generator manufacturing & delivery	40 ewks	Mon 11/30/20	Mon 9/6/21	30
32		Electrical equipment vendor design	120 edays	Mon 11/30/20	Tue 3/30/21	27,30
33		Submittals and approvals	60 edays	Tue 3/30/21	Sat 5/29/21	32
34		Electrical equipment procurement, fabrication & delivery	300 edays	Sat 5/29/21	Fri 3/25/22	33
35		**Task 5 - Engineering for Construction Contract**	**96 days**	**Mon 5/31/21**	**Tue 10/12/21**	
36		Develop bid documents	14 edays	Mon 5/31/21	Mon 6/14/21	10
37		Revise Plans & Specifications	90 edays	Mon 6/14/21	Sun 9/12/21	36,33,30,27
38		Borough review and comments	14 edays	Sun 9/12/21	Sun 9/26/21	37
39		Finalize Plans and Specs	14 edays	Sun 9/26/21	Sun 10/10/21	38
40		Develop construction cost final estimate	30 edays	Sun 9/12/21	Tue 10/12/21	37
41		Submit QCIP, TESCP and P&S for FERC submittal	30 edays	Sun 9/12/21	Tue 10/12/21	37,11
42		**Task 6 - Construction Bidding Assistance**	**105 days**	**Sun 10/10/2**	**Mon 3/7/22**	
43		Assist Borough with advertisement	14 edays	Sun 10/10/21	Sun 10/24/21	39
44		Issue bid documents	0 days	Sun 10/24/21	Sun 10/24/21	43,39,11
45		Job walk	4 edays	Mon 11/1/21	Fri 11/5/21	44
46		Bids due	90 edays	Sun 10/24/21	Sat 1/22/22	44
47		Bid evaluation & award	30 edays	Sat 1/22/22	Mon 2/21/22	46
48		FERC approval of QCIP, TESCP and P&S	60 edays	Tue 10/12/21	Sat 12/11/21	41
49		Issue notice to proceed	14 edays	Mon 2/21/22	Mon 3/7/22	47,48
50		**Task 7 - Engineering Services During Construction**	**259 days**	**Mon 11/1/21**	**Fri 10/28/22**	
51		Materials procurement & delivery	70 edays	Mon 3/7/22	Mon 5/16/22	49,27,30,33
52		Winter	6 emons	Mon 11/1/21	Sat 4/30/22	
53		Summer	6 emons	Sun 5/1/22	Fri 10/28/22	
54		Mobilize on-site	14 edays	Mon 5/2/22	Mon 5/16/22	28,31,34,52
55		Shutdown project	0 days	Mon 5/16/22	Mon 5/16/22	54,51
56		Penstock repair	120 edays	Mon 5/16/22	Tue 9/13/22	55
57		Demolition of existing powerhouse equipment	30 edays	Mon 5/16/22	Wed 6/15/22	54,55
58		Installation of new equipment	90 edays	Wed 6/15/22	Tue 9/13/22	57
59		Startup & commissioning	45 edays	Tue 9/13/22	Fri 10/28/22	58,55
60		Online	0 days	Fri 10/28/22	Fri 10/28/22	59

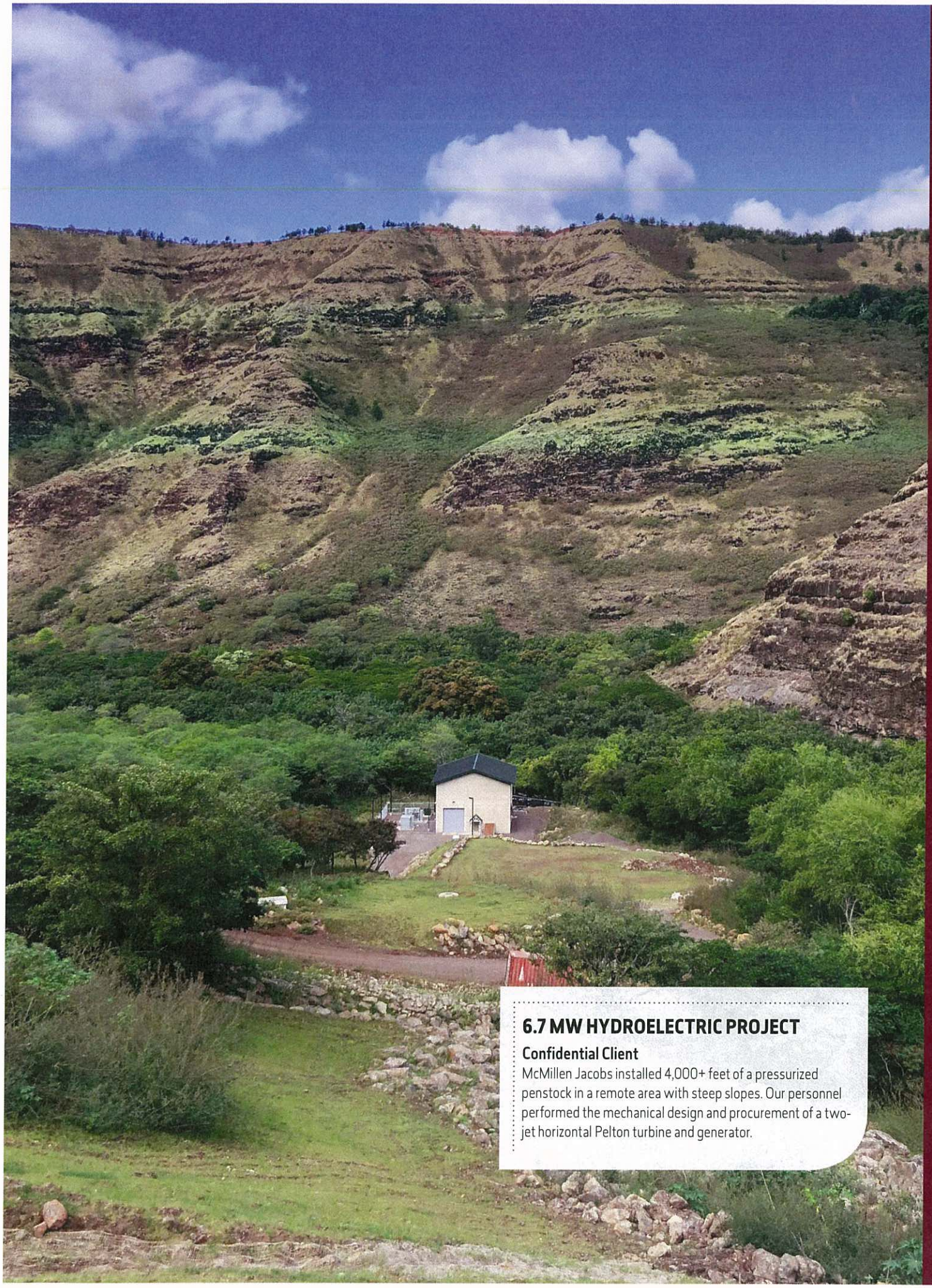


Project: Combined schedule 03
Date: Thu 5/2/19

Task · Split · Milestone · Summary · Project Summary · Inactive Task · Inactive Milestone · Inactive Summary · Manual Task · Duration-only · Manual Summary Rollup · Manual Summary · Start-only · Finish-only · External Tasks · External Milestone · Deadline · Critical · Critical Split · Progress · Manual Progress

McMillen Jacobs Associates

Thu 5/2/19



6.7 MW HYDROELECTRIC PROJECT

Confidential Client

McMillen Jacobs installed 4,000+ feet of a pressurized penstock in a remote area with steep slopes. Our personnel performed the mechanical design and procurement of a two-jet horizontal Pelton turbine and generator.

3.0 Staff/Resources

McMillen Jacobs has assembled a highly technical team of professionals with the specialized qualifications required to successfully execute the Blind Slough Hydroelectric Refurbishment Project. This section will explain the structure of our team, introduce our key team members, and establish the anticipated roles and responsibilities. As shown in our organizational chart, it is our intent to offer the Borough full service for this Project, including assistance with FERC and regulatory support.

3.1 Organization Chart

Figure 3.1 presents McMillen Jacobs' team. The Borough has already worked with most of the staff that will be involved with the Project. It also provides the names of key members that are committed to your Project. The organizational chart identifies clear lines of communication and a path of resolution if needed. The experience and qualifications below provide the evidence that this team is fully capable of completing the scope of work. Our team averages over 22 years of experience in the design, construction, and/or operations of similar elements. Every member of our team brings experience that is unique to hydroelectric projects. Details on relevant qualifications are presented in the resumes for each individual at the end of this section. Our key staff resumes are located first, followed by the ITR team members, and then the design support team alphabetically by last name.

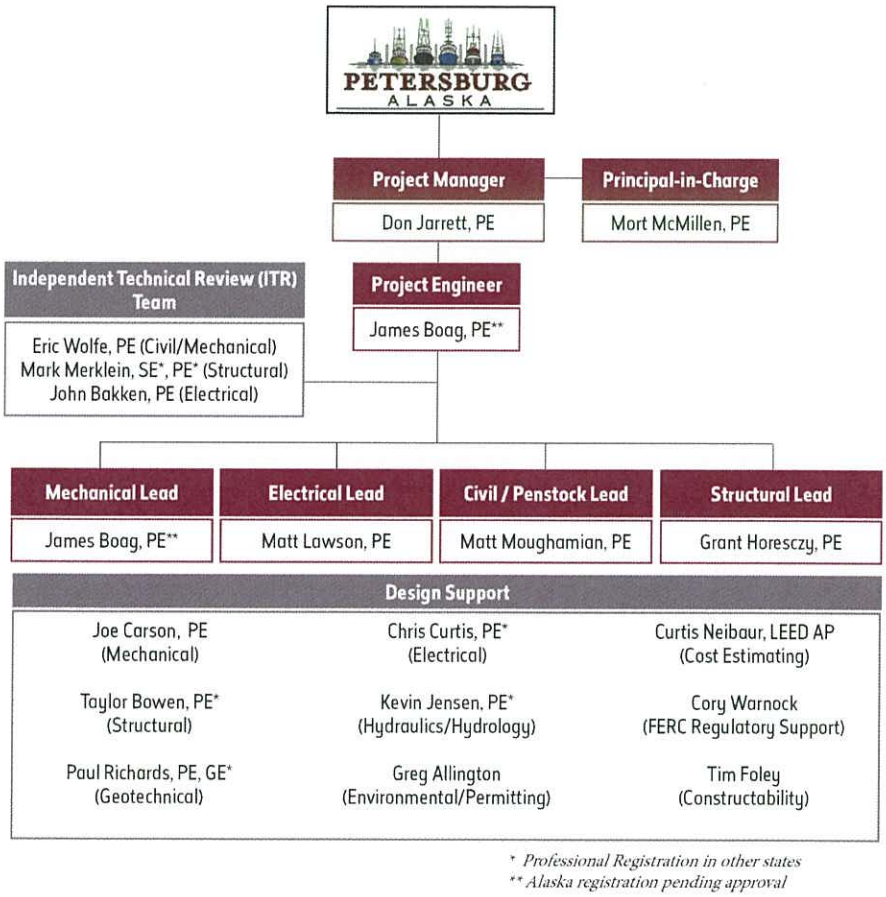


Figure 3-1. Organizational Chart

Mort McMillen will serve as the Principal-in-Charge with overall responsibility for management oversight of the Project. Mr. McMillen brings a proven record of managing challenging projects utilizing multi-discipline teams. He has participated in over 150 projects at hydroelectric facilities and dams throughout the country and specifically in the Columbia River Basin.

Don Jarrett will serve as the Project Manager. Mr. Jarrett has over 35 years of hydroelectric experience, including design, support during construction, FERC compliance/consultation, environment/regulatory permitting, start-up and commissioning support, and leadership of multi-discipline teams.

3.2 Roles and Responsibilities

Table 3-1 lists the roles and responsibilities for the Project team.

Table 3-1. Staff Roles and Responsibilities

Key Member	Proposed Title	Role / Description
Mort McMillen	Principal-in-Charge	Responsible for ensuring staff resources are provided, oversight on the work execution, and executive with signature authority for the design team.
Don Jarrett	Project Manager, Startup & Commissioning	Provide day-to-day management of the design team. Primary point-of-contact for the Borough. QA/QC process implementation and oversight.
James Boag	Mechanical Lead	Engineering, procurement, and installation of the turbine-generator package including startup, testing, commissioning, operations, and maintenance.
Matt Lawson	Electrical Lead	Engineering of electrical and control equipment for equipment procurement and powerhouse construction contract.
Matt Moughamian	Civil / Penstock Lead	Site civil development, penstock repair engineering, and civil support for powerhouse refurbishment.
Grant Horesczy	Structural Lead	Engineering for powerhouse generating equipment foundations and modifications and penstock modifications and repairs.
Eric Wolfe, Mark Merklein, & John Bakken	ITR Team	Development and implementation of the Quality Management Plan, technical guidance, and review of submittals, reports, specs, and drawings for quality and conformance with requirements.
Greg Allington	Environmental/ Permitting Lead	Preparation of local, state, and federal environmental permits during the design process (if required). Includes coordination and negotiation with the involved agencies. Assist with preparation of temporary erosion and soil control plan. Assist consultation with SSRAA for hatchery flow maintenance during construction outages of the penstock. Oversee construction related activities such as preparing SWPPS and Spill Control Plans.
Taylor Bowen	Structural Support	Provide research, calculations, and drawings to support structural designs.
Joe Carson	Mechanical Support	Engineering for equipment procurement and powerhouse refurbishment including valves, gates, and other mechanical equipment.
Chris Curtis	Electrical Support	Engineering for electrical components of the powerhouse refurbishment.
Tim Foley	Constructability	Early planning with the design team, constructability reviews, scheduling, and management of construction activities.
Kevin Jensen	Hydraulics/ Hydrology Support	Support design team, hydraulic analysis and design, and develop inflow hydrology design flow range. Analysis for turbine-generator size optimization.

Curtis Neibaur	Lead Construction Estimator	Construction cost estimating.
Paul Richards	Geotechnical Support	Geotechnical investigations, foundation design, rock mechanics, and stability.
Cory Warnock	Regulatory/FERC Support	Regulatory / FERC compliance during design and construction.

3.3 Engineering, Permitting, and Design Experience

McMillen Jacobs has prepared plans and specifications for a wide range of features at hydropower projects including powerhouses and associated equipment, penstocks, spillways and gates, bridges and access roads, and diversion structures. We have a long history in managing multi-discipline teams providing design of civil, structural, mechanical, electrical, and geotechnical works. Our regulatory and permitting specialists have many years of experience managing FERC-directed compliance activities and obtaining local, state and other federal permits and approvals for the construction of hydroelectric upgrades. During construction, these same specialists direct environmental monitoring and permit compliance associated with land disturbing and in-water work.

We have developed design plans and specifications, engineering analysis, and permitting, and in some cases, constructed projects with similar features to the Blind Slough Hydro project including new powerhouse equipment, repairs to powerhouse structures, and repairs to existing penstocks. Our designs have often exceeded FERC requirements resulting in prompt FERC approval due to the detailed project construction documents, design report, calculations, and supporting documents. Similarly, our permitting process experience and established relationships has often resulted in obtaining permits on time with anticipated permit conditions.

A good example of our design capabilities is demonstrated by the *Allison Creek Hydro Design-Build Project in Valdez, Alaska,* where we developed full plans and specifications consisting of 240 drawings. Of particular note, is that this design was completed from initial concept through final stamped drawings in only 5 months. This included three formal review submittals to the client as well as a review meeting with the FERC technical lead at the 60% and 100% level of completion. During the design process, the value engineering process identified a tunnel through an existing ridge would be required to provide access to the diversion dam/intake and upper penstock for construction. This represented a major departure from the original FERC license as well as major revisions to the penstock plan/profile, thrust block location and design, and access road route. Coordination with FERC also required modification to the diversion dam foundation design between the 60% and 90% design submittal. These modifications were incorporated efficiently through the well-coordinated engineering disciplines and well experienced project manager's ability to efficiently implement design changes.

Proven Performance
Design and FERC Approvals

"Despite the difficulty of the job, McMillen has been outstanding. The design featured many cost reduction measures that reduced the project from $60 million to $50 million....We are now 1 month into construction and McMillen is already 2 weeks ahead of schedule." - John Duhamel, CEO & Project Manager, Copper Valley Electric Association

Most of our design projects for hydroelectric facilities present challenges due to their remote location, small footprint, difficult access, and a wide variety of environmental and FERC issues at each location. On the Grant Lake Hydroelectric Project, our team performed the initial alternative analysis for potential hydro sites throughout Alaska region for Homer Electric. Work included geotechnical site assessments, licensing documents for FERC, hydrologic and hydraulic analysis conceptual design, conceptual design for dam, powerhouse, penstock, and a

3,200-foot-long tunnel. Design development for this project required innovative water intake design to maintain pre-development water temperatures in Grant Creek to maintain spawning gravels.

Our team has a rigorous quality assurance program to ensure a high-quality product which meets all FERC requirements. During design, we develop a design criteria document that is specific to the Project. Our team performs comprehensive calculations that are documented in a design documentation report (DDR). In addition, the drawings, specifications, and DDR have a documented independent technical review (ITR) performed by senior engineers.