

## Appendix A

### Basic Services of Engineer City of Billings W.O. 18-21 – WTP Intake Redundancy

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#### Section 1. Engineer's Rights and Duties.

- A. To furnish all labor, materials, equipment, supplies, and incidentals necessary to conduct and complete the Engineer's portion of the project as defined in the scope of work and to prepare and deliver to Billings all plans, specifications, bid documents, and other material as designated herein.
- B. Ascertain such information as may have a bearing on the work from local units of government, utility companies, and private organizations and shall be authorized to procure information from other authorities besides Billings, but shall keep Billings advised as to the extent of these contacts and the results thereof.
- C. Prepare and present such information as may be pertinent and necessary in order for Billings to pass critical judgment on the features of the work. The Engineer shall make changes, amendments or revisions in the detail of the work as may be required by Billings. When alternates are being considered, Billings shall have the right of selection.
- D. Engineer's work shall be in accordance with the standards of sound engineering and present City, State, and National standards and policies currently in use.
- E. Conform to the requirements of the Montana Code Annotated Title 18 "Public Contracts" and more particularly Sections 18-2-121 and 18-2-122, and all other codes of the State of Montana applicable to providing professional services including codes and standards nationally recognized.
- F. The Engineer shall certify with the submission of final plans that the plans are in conformance with applicable sections of Title 69, Chapter 4, Part 5, of the Montana Code Annotated as pertaining to existing utilities.
- G. To perform professional services in connection with the project and will serve as Billings' representative in those phases of the project to which this agreement applies.
- H. Where Federal funds are involved, the necessary provisions to meet all requirements will be complied with and documents secured and placed in the bidding documents.
- I. Submit an estimated progress schedule as to time and costs at the beginning of the work, and monthly progress reports thereafter until complete. The reports will include any problems, potential problems, and delays as foreseen by the Engineer. Reports will be submitted in a timely manner to permit prompt resolution of problems.
- J. Contract administration duties will include review of contractor certified payrolls for wage rate compliance. Discrepancies in certified payrolls will be resolved with the Contractor. A signed Engineer's Payroll Check Sheet (included in the Standard

Modifications to MPWSS) will be submitted as proof of this review with one copy of each payroll.

- K. Name a Task Director who shall be the liaison between Billings and the Engineer. For this project the Task Director designated for the Engineer is Scott Buecker working under the Principal-in-Charge, Brett Jochim.

Section 2. Billings Rights and Duties.

- A. To furnish all labor, materials, equipment, supplies, and incidentals necessary to conduct and complete Billings' portion of the project as designated in the scope of work.
- B. Name a Task Director who shall be the liaison between the Engineer and Billings. For this project, the Task Director designated is Will Robbins, working under the City Engineer, Debi Meling.

Section 3. Scope of Work.

The following scope description covers the Study and Report Phase for the City of Billings WTP Intake Redundancy Project. Additional phases of the project have not been scoped at this time, as the details of the work that is required will vary depending on the intake alternative that is recommended by AE2S and approved by the City of Billings for final design and implementation.

After completion of this Study and Report Phase, AE2S will negotiate the scope and fee for the subsequent phases with the City of Billings. These are anticipated to include Preliminary Design, Final Design, Bidding Negotiations, Construction Services and Post-Construction Services.

**TASK SUMMARY**

<b>Phase 020 Study and Report Tasks</b>
<b>Task 1 - Project Management</b>
<b>Task 2 – Onsite Workshops/Meetings</b>
<b>Task 3 – Design Conditions and Criteria</b>
<b>Task 4 – Hydrogeologic Evaluation</b>
<b>Task 5 – River Geomorphology Evaluation</b>
<b>Task 6 – Intake Alternatives Study</b>

**Scope Description**

<b>Task 1 – Project Management</b>
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<i>Tasks</i>	<ul style="list-style-type: none"> <li>• Manage budget, schedule and scope completion. Provide a Monthly update for inclusion with monthly invoice</li> <li>• Develop a Project Management Plan, including Gantt chart schedule for the Project</li> <li>• Monthly Project Update Conference Call with City Staff (up to 4 meetings)</li> <li>• Internal Project Meetings</li> <li>• Quality Management (QA/QC)</li> <li>• Bi-weekly conference call with City Staff, or as needed</li> </ul>
<i>Deliverables</i>	<ul style="list-style-type: none"> <li>• Monthly Updates w/ Invoices, Project Management Plan</li> </ul>

<b>Task 2 – Onsite Workshops/Meetings</b>	
<i>Tasks</i>	<ul style="list-style-type: none"> <li>• Project Kickoff Work Shop (With Subconsultants)</li> <li>• Hydrogeologic/Geomorphic Finalization Workshop</li> <li>• Intake Alternatives Workshop</li> <li>• Presentation to City of Draft Work</li> </ul>
<i>Deliverables</i>	<ul style="list-style-type: none"> <li>• Work Shop Agendas, Meeting Minutes, Presentation Materials, Handouts</li> </ul>

<b>Task 3 – Design Conditions and Criteria</b>	
<i>Tasks</i>	<ul style="list-style-type: none"> <li>• Data Collection/Compilation of the following, as available: <ul style="list-style-type: none"> <li>○ Primary, Secondary Intake and Pump Station Record Drawings</li> <li>○ Available River bathymetry, temperature, stream flow, water quality</li> <li>○ Site geotechnical data (previous work, well boring logs, etc.)</li> <li>○ Planning documents related to the WTP (e.g., flood mapping, future site layouts)</li> <li>○ Property boundaries, easements and utility information</li> <li>○ Hydraulic Information (historic limits of intake)</li> </ul> </li> <li>• ENGINEER will compile and summarize the data for inclusion in final work product</li> <li>• Additional Service – Surveying/Bathymetric Surveys/Water Quality &amp; Biology Testing</li> </ul>
<i>Deliverables</i>	<ul style="list-style-type: none"> <li>• Section of the Final Intake Alternatives Study</li> </ul>

<b>Task 4 – Subsurface Intake Conceptual Narrative</b>	
<i>Tasks</i>	<ul style="list-style-type: none"> <li>• ENGINEER and its SUBCONSULTANTS (Layne Christensen Company) shall perform a desktop construction estimate effort of a subsurface intake alternative and discuss in conceptual level a horizontal collector well and bank filtration intakes.</li> <li>• Independent review/consultation with subsurface subconsultant (Layne Christensen).</li> <li>• Quality Management (QA/QC)</li> </ul>
<i>Deliverables</i>	<ul style="list-style-type: none"> <li>• Section of the Final Intake Alternatives Study</li> </ul>

<b>Task 5 – River Geomorphology Evaluation</b>	
<i>Tasks</i>	<ul style="list-style-type: none"> <li>• ENGINEER and its SUBCONSULTANT (Applied Geomorphology, Inc.) shall perform a geomorphic evaluation, including: <ul style="list-style-type: none"> <li>○ Upstream horizontal and vertical geomorphology review</li> <li>○ River rates of change, aggregational/degradational trends</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>○ Vertical morphology at the existing intake locations</li> <li>○ Assess long-term potential changes and vulnerabilities</li> <li>○ Compilation of available historic imagery and mapping to evaluate rates of change, patterns of channel movement, and anticipated morphologic conditions site. Additional available data regarding channel cross section morphology and aggradational/degradational trends will be compiled and summarized. Available data include imagery from the 1950s, 1970s, 1995, 2005, 2011, and 2017. Cross section data are available from previous studies such as the Yellowstone River Pipeline Risk Assessment (Atkins 2012).</li> <li>○ Review proposed design alternatives.</li> </ul>
<i>Deliverables</i>	<ul style="list-style-type: none"> <li>● Geomorphology Technical Memorandum</li> </ul>

<b>Task 6 – Intake Alternative Evaluation</b>	
<i>Tasks</i>	<ul style="list-style-type: none"> <li>● ENGINEER shall review geomorphic evaluations and findings.</li> <li>● Hydraulic Evaluation of Existing Intake Structures (Tower, pipelines, wetwell)</li> <li>● Perform Intake Design Alternatives Development for the following alternatives: <ul style="list-style-type: none"> <li>○ Subsurface Intake (Desktop Feasibility/Overview)</li> <li>○ Existing Tower Rehabilitation/Screen Additions</li> <li>○ Crib/Barrel Screen (new location)</li> </ul> </li> <li>● Feasible alternatives and location(s) shall be <ul style="list-style-type: none"> <li>○ Identified based on constructability, capacity, obtaining optimum water quality, providing flexibility on intake elevations and viable conveyance routing</li> <li>○ Provided with ENGINEER’s opinion of probable cost (construction and OM&amp;R)</li> <li>○ Compared for reliability/performance with respect to drought, floods and ice impacts</li> </ul> </li> <li>● ENGINEER will identify and summarize permitting requirements for the project.</li> <li>● Perform structural and electrical evaluation of the existing intake structures and provide recommendations, if any, of required improvements.</li> <li>● Perform constructability review of the alternatives, including review with intake diving experts</li> <li>● Conceptual CAD layouts of recommended alternative and visual aid concepts of the other alternatives.</li> <li>● Develop an AACE Level IV Cost Estimate for the recommended project.</li> <li>● Develop DRAFT Intake Alternative Study Technical Memorandum.</li> <li>● Review DRAFT report with the City and finalize report.</li> <li>● Present recommendations to City and critical path for moving forward with recommendations.</li> </ul>
<i>Deliverables</i>	<ul style="list-style-type: none"> <li>● Intake Alternative Study Technical Memorandum</li> </ul>

A riverbed subsurface geotechnical investigation may be needed to definitively determine the feasibility of subsurface intake alternative(s). This will only be done if a thorough desktop analysis indicates that subsurface intake alternatives merit further study.

Subsequent phases are anticipated to include preliminary and final design, bidding, construction, and post construction phase services.

<b>Phase 021 – River Bed Subsurface Investigation (If Recommended in Phase 020)</b>	Future Amendment Negotiations with the City, dependent upon the intake project recommended by AE2S and approved by the City in Phase 020
<b>Phase 030 - Study and Report</b>	
<b>Phase 040 - Final Design</b>	
<b>Phase 050 - Bidding Services</b>	
<b>Phase 060 - Construction Services</b>	
<b>Phase 070 - Post Construction Services</b>	