

AMENDMENT: COPPER TREATMENT

EXHIBIT A – SCOPE OF SERVICES

This project will include the design of a Copper Treatment Process to exceed the Permit No. GA0030791 copper discharge limits of 8.8 parts per billion (ppb) at the Potato Creek Water Pollution Control Plant (PCWPCP). The design process will include wastewater bench scale testing, process alternative pilot testing, and other such scientific methods to determine the best treatment option and design parameters for the effective treatment of copper, as well as the design of the copper removal treatment process. The work consists of the following major components:

- Wastewater bench scale and pilot testing
- Solids handling analysis
- Supernatant return analysis
- Detailed design of treatment process
- Probable Construction Cost Estimate
- Plans and specifications development

Phase 1 – Bench Scale and Pilot Testing:

PCG will conduct bench scale and pilot testing to aid in determining the best treatment option for the removal of copper from the PCWPCP's effluent in order to meet and exceed permit requirements. The testing will include:

Task 1.1 – Testing Plan:

PCG will develop a testing plan to determine the most effective treatment options for copper removal. The testing plan will include bench scale testing to aid in determining chemical choice and dosing, as well as, pilot testing plan to evaluate possible process equipment. The Testing Plan will be discussed with OWNER.

Task 1.2 – Testing:

PCG will run bench scale tests per the Testing Plan. Once bench scale testing results have been evaluated, PCG will run pilot testing of manufacturer provided equipment per the Testing Plan. The OWNER will provide wastewater, water, and electricity for testing and pilot studies. Testing will not hinder the normal operation of the PCWPCP.

Task 1.3 – Testing Results Analysis:

PCG will evaluate the testing results and present findings in a Technical Memorandum to OWNER.

Phase 2 – Copper Treatment Design:

PCG will work through the decision process with the OWNER to determine the best alternative, based on Testing Results, for the treatment of copper at PCWPCP. The process will include the following Tasks:

Task 2.1 – Detailed Design:

PCG will design the selected treatment option. The design will include process, structural, and electrical design elements and incorporate results of bench scale and pilot testing.

Task 2.2 – Specification Development:

PCG will develop specifications for the selected treatment process. Some of the specifications will most likely be performance based to ensure copper removal achievement.

Task 2.3 – Engineer’s Construction Cost Estimation:

PCG will complete an Engineer’s Probable Construction Cost Estimate for the alternatives and designed treatment options. The Engineer’s Probable Construction Cost Estimate for the alternatives will aid in determining the best alternative for the treatment of copper. The Engineer’s Probable Construction Cost Estimate for the designed treatment process will ultimately be included in the overall Engineer’s Probable Construction Cost Estimate for the Potato Creek WPCP Expansion from 2.0 to 3.0 mgd.

Task 2.4 – Engineer’s Probable Life Cycle Estimation:

PCG will complete an Engineer’s Probable Life Cycle Estimate for the selected and designed treatment options. The Engineer’s Probable Life Cycle Estimate for the alternatives will aid in determining the best alternative for the treatment of copper. The Engineer’s Probable Life Cycle Estimate for the designed treatment process will ultimately be included in the overall Engineer’s Probable Life Cycle Estimate for the Potato Creek WPCP Expansion from 2.0 to 3.0 mgd.

Phase 3 – Alternative Selection Workshop:

PCG will prepare and conduct a workshop with the OWNER in order to develop a list of alternatives to be evaluated and to define criteria for comparing alternatives. PCG will review results of pilot testing with OWNER and lead discussion resulting in selection of a best treatment alternative.

Phase 4 – Final Documentation:

PCG will prepare final documentation including detailed Plans and Specifications, a Word document describing the alternative selection process, an Engineer’s Probable Construction Cost Estimate, and Engineer’s Probable Life Cycle Estimates. The final documentation will include quality assurance and quality control prior to submittal.

PCG will conduct QA/QC of all drawings, specifications, and calculations simultaneously as the OWNER and then meet with the OWNER to discuss the final design.

Final Plans and Specifications will be included in Potato Creek WPCP Expansion from 2.0 to 3.0 mgd bid documents.

Phase 5 – Construction Management and Inspection:

PCG will review contractor submittals and provide clarifications to contractor for 24 months of construction phase. PCG will review shop drawings and submittals and communicate with contractor during the twenty-four (24) month construction phase.

PCG will provide on-site inspection during the twenty-four (24) month construction phase. PCG will communicate progress electronically with the OWNER on a weekly basis during the construction phase.

Bi-weekly progress updates will be provided to OWNER by PCG electronically.

Deliverables will be provided in digital format including Word, Excel, PDF and any other electronic formats. These include all calculations, processes and engineering documents which become the property of the OWNER for use on this project. Reuse of these documents on other projects is solely at the risk of the OWNER.

ATTACHMENT B – BASIS OF COMPENSATION

The compensation limits are based on the scope of services described in EXHIBIT A and include the design of a copper treatment removal treatment process to meet NPDES permit limits for the Potato Creek Water Pollution Control Plant.

Phase 1 - Benchscale and Pilot Testing

Professional Services Fee: Phase Sub-total not to Exceed: \$58,260 as described in Task breakdown (reference attached man-hour and budget worksheet) Scope of Work: Included in EXHIBIT A

Task 1.1 – Testing Plan:

Professional Services Fee: Not to Exceed \$10,580 (reference attached man-hour and budget worksheet)

Task 1.2 – Testing:

Professional Services Fee: Not to Exceed \$29,540 (reference attached man-hour and budget worksheet)

Task 1.3 – Testing Results Analysis:

Professional Services Fee: Not to Exceed \$18,140 (reference attached man-hour and budget worksheet)

Phase 2 – Copper Treatment Design

Professional Services Fee: Phase Sub-total not to Exceed: \$86,500 as described in Task breakdown (reference attached man-hour and budget worksheet) Scope of Work: Included in EXHIBIT A

Task 2.1 – Detailed Design:

Professional Services Fee: Not to Exceed \$34,960 (reference attached man-hour and budget worksheet)

Task 2.2 – Specification Development:

Professional Services Fee: Not to Exceed \$12,860 (reference attached man-hour and budget worksheet)

Task 2.3 – Construction Cost Estimate:

Professional Services Fee: Not to Exceed \$17,800 (reference attached man-hour and budget worksheet)

Task 2.4 – Life Cycle Estimate:

Professional Services Fee: Not to Exceed \$20,880 (reference attached man-hour and budget worksheet)

Phase 3 – Alternative Selection Workshop:

Professional Services Fee: Not to Exceed \$7,860 (reference attached man-hour and budget worksheet) Scope of Work: Included in EXHIBIT A

Phase 4 – Final Documentation:

Professional Services Fee: Not to Exceed \$17,730 as described in Task breakdown (reference attached man-hour and budget worksheet) Scope of Work: Included in EXHIBIT A

Task 4.1 – Final Design and Specifications:

Professional Services Fee: Not to Exceed \$13,350 (reference attached man-hour and budget worksheet)

Task 4.2 – QA/QC:

Professional Services Fee: Not to Exceed \$4,380 (reference attached man-hour and budget worksheet)

Phase 5 – Construction Management and Inspection:

Professional Services Fee: Not to Exceed \$29,640 as described in Task breakdown (reference attached man-hour and budget worksheet) Scope of Work: Included in EXHIBIT A

Task 5.1 – Construction Management:

Professional Services Fee: Not to Exceed \$14,220 (reference attached man-hour and budget worksheet)

Task 2.2 – Resident Inspection:

Professional Services Fee: Not to Exceed \$15,420 (reference attached man-hour and budget worksheet)

Sub-Total of the estimated fees from Phases 1 through 5 is \$199,990.

MAN-HOUR AND BUDGET WORKSHEET

Amendment: Copper Treatment

City of Griffin 2014 August 5

DESCRIPTION	MANHOURS AND COSTS										
	MANHOURS						COST				
	PR	SE	WWSM	SLA/P LAN	INSP/ ENG TECH	AA	DRAFT	SUB	TOTAL HOURS	DIRECT LABOR COST	TOTAL LABOR COST
Benchscale and Pilot Testing	135	135	135	125	75	50	75	135			
Testing Plan	12	180	124	0	32	48	0	80	476	58,260	58,260
Testing	4	40	24		8	16			92	10,580	
Testing Results Analysis	4	80	40		16	16		80	236	29,540	
Copper Treatment Design	16	152	140	72	96	50	40	172	738	86,500	86,500
Detailed Design	4	80	60	32	20		40	52	288	34,960	
Specification Development	4	24	24		24	16		24	116	12,860	
Construction Cost Estimation	4	24	24	16	20	16		48	152	17,800	
Life Cycle Estimation	4	24	32	24	32	18		48	182	20,880	
Alternative Selection Workshop	4	16	16	0	24	0	16	0	76	7,860	7,860
Alternative Selection Workshop	4	16	16		24		16		76	7,860	
Final Documentation	8	32	48	0	10	0	32	20	150	17,730	17,730
Final Design and Specifications	4	32	24		10		24	20	114	13,350	
QAQC	4		24				8		36	4,380	
Construction Management and Inspection	8	64	64	0	64	0	0	48	248	29,640	29,640
Construction Management	4	32	32		24			24	116	14,220	
Resident Inspection	4	32	32		40			24	132	15,420	

Project Cost Estimate 199,990

