ERIE COUNTY WATER AUTHORITY
AUTHORIZATION FORM
For Approval/Execution of Documents
(check which apply)

Contract: MP-079 **Project No.:** 201700136
Project Description: Optimal Corrosion Control Treatment Study

Item Description:

- [ ] Agreement
- [X] Professional Service Contract
- [X] Amendment
- [ ] Change Order
- [ ] BCD
- [ ] NYSDOT Agreement
- [ ] Contract Documents
- [ ] Addendum
- [ ] Recommendation for Award of Contract
- [ ] Recommendation to Reject Bids
- [ ] Request for Proposals
- [ ] Other

Action Requested:

- [X] Board Authorization to Execute
- [X] Legal Approval
- [ ] Board Authorization to Award
- [X] Execution by the Chairman
- [ ] Board Authorization to Advertise for Bids
- [ ] Execution by the Secretary to the Authority
- [ ] Board Authorization to Solicit Request for Proposals
- [ ] Other

Approvals Needed:

APPROVED AS TO CONTENT:

- [X] Department Head — Date: 7-30-19
- [X] Risk Manager — Date: 07/31/2019
- [X] Director of Administration — Date: 7/30/19
- [X] Executive Engineer — Date: 7/30/19

APPROVED AS TO FORM:

- [X] Legal — Date: 7/31/19

APPROVED FOR BOARD RESOLUTION:

- [X] Secretary to the Authority — Date: 7/31/19

Remarks: Amendment #1

Resolution Date: **Item No:**

ERIE COUNTY WATER AUTHORITY

INTEROFFICE MEMORANDUM

July 30, 2019

To: Terrence D. McCracken, Secretary to the Authority

From: Leonard F. Kowalski, Senior Distribution Engineer

Subject: Contract MP-079
Optimal Corrosion Control Treatment Study
ECWA Project No. 201700136

Attached are the following documents:

1. ECWA Authorization Form for processing Professional Service Contract Amendment #1 with Arcadis of New York, Inc.
2. Three originals of Professional Service Contract Amendment #1 for the above referenced project.

The Authority desired to have their current corrosion control treatment (CCT) practices reviewed and potential impacts and/or enhancements identified. Arcadis with team member Cornwell Engineering Group (formerly Environmental Engineering & Technology or EE&T) has been retained to perform an updated corrosion control desktop evaluation to address the current water quality and practices at each water treatment plant and in the distribution system. A draft report was provided to the Authority and within that report is a recommendation to perform demonstration testing that will focus on the following items:

- Evaluating the stability of the existing pipe scales under varying chlorine residuals
- Assessing the impact that the City of Buffalo's water may have on existing pipe scales
- Assessing the effectiveness of different corrosion inhibitors and/or doses

Prior to following through with a demonstration study, the Engineering Department is recommending performing coupon testing. The coupon testing will provide the following benefits to the Authority:

- Additional insights on potential impacts of continued use of Buffalo water on corrosion control via laboratory testing procedures in a relatively short period of time.
- Selection of an optimal orthophosphate dose and target pH if this corrosion control strategy is carried forward, and
- Reduce the required number of pipe loop studies that would be conducted in the future if addition of orthophosphate was determined to be a preferred approach. The reduction in the number of pipe loop scenarios to be evaluated is estimated to avoid future costs of approximately $200,000.

The coupon testing will provide the Authority valuable feedback with regards to blending our water with the City of Buffalo's water, it will provide a clear path forward with our overall corrosion control treatment process and provide significant savings with the demonstration testing project. Once the results are received from the coupon testing, it is the Engineering Departments intent to solicit proposals for the demonstration testing project.

The coupon testing can be performed under Paragraph 2.B.1, Special Services of the Professional Service Agreement. Under that paragraph, additional laboratory testing is allowed.

The Special Services line item in the contract needs to be increased by $75,000 in order to perform the coupon testing.

LFK:jmf
Attachments
cc: R.Stoll
L.Lester
CONT-MP-079-1701-011

ARCADIS | Design & Consultancy for natural and built assets

Mr. Leonard Kowalski, PE
Director of Engineering
Erie County Water Authority
3030 Union Road
Cheektowaga, NY 14227

Subject:
MP-79: Optimal Corrosion Control Treatment Study
Special Services – Additional Laboratory (Coupon) Studies

WATER BUSINESS UNIT

Date:
June 28, 2019

Contact:
Mark Lenz, PE

Phone:
716-316-5886

Email:
Mark.Lenz@arcadis.com

Our ref:
00041933.0001

Mr. Kowalski,

Arcadis of New York, Inc. (Arcadis) is pleased to submit this proposal for coupon studies for the ongoing Erie County Water Authority (ECWA) Optimal Corrosion Control Treatment Study Project (Project). This proposal is based on recommendations provided in our draft report, *Corrosion Control Treatment Desktop Evaluation,* submitted March 7th and previous discussions.

In accordance with past discussions with ECWA and our understanding of the Project, Arcadis with subconsultant Cornwell Engineering Group (Cornwell) will complete coupon studies to further evaluate corrosion control treatment options. The purpose of coupon testing will be to achieve several objectives, namely:

- Evaluate various orthophosphate doses at two different pH values using ECWA water (Phase 1).
- Assess the impact of blending Buffalo water with ECWA water at a range of blend ratios (Phase 2).

This testing will provide ECWA:

- Additional insights on potential impacts of continued use of Buffalo water on corrosion control via laboratory testing procedures in a relatively short period of time,
- Selection of an optimal orthophosphate dose and target pH if this corrosion control strategy is carried forward, and
- Reduce the required number of pipe loop studies that would be conducted in the future if addition of orthophosphate was determined to be a preferred approach. The reduction in the number of pipe loop scenarios to be evaluated is estimated to avoid future costs of $200,000.

The scope of work will include coupon testing conducted by Cornwell at the Cornwell Laboratory in Newport News, VA and development of a technical memorandum prepared by Cornwell and Arcadis. The remainder of this proposal serves to outline our proposed list of tasks, project schedule and fee.

TASKS, SCHEDULE AND FEE

Arcadis's services will include the following:

Task 1 – Inhibitor Dose Screening

Task 1 will comprise of eight (8) coupons in triplicates (total 24 coupons) that will be acclimated to current ECWA full-scale treated water with orthophosphate added in the laboratory at four different doses for two different pH values (7.5 and 8.0). Triplicates are required so that whichever dose is optimal can be used in Phase 2 to test the three different blends. Two coupons, one at each of the different pH values (7.5 and 8.0), will also be tested as a control (without orthophosphate) condition using ECWA full-scale treated water. Task 1 will be completed in approximately 6-weeks once the coupons have been acclimatized to the test conditions. Task 1 test conditions are summarized in the table below:

Table 1: Inhibitor Dose Screening Summary

Source Water	Target Finished pH	Corrosion Control Product	Chemical Corrosion Dose (mg/L as PO4)	Number of Lead Coupons
ECWA	7.5	No Orthophosphate	0	3
		Orthophosphate (in the form of H_3PO_4)	Dose 1	3
			Dose 2	3
			Dose 3	3
			Dose 4	3
ECWA	8.0	No Orthophosphate	0	3
		Orthophosphate (in the form of H_3PO_4)	Dose 1	3
			Dose 2	3
			Dose 3	3
			Dose 4	3
			Total Jars =	**30**

Task 2 – City of Buffalo Source Water Assessment

Task 2 will commence after the acclimation period. ECWA acclimatized coupons at optimal corrosion inhibitor dose and at pH 7.5 and 8.0 will be used with three different Buffalo Water blend ratios (33%, 67%, and 100%). Additionally, the control test coupons (without orthophosphate) for pH 7.5 and 8.0 will

also be used with City of Buffalo source water at different blend ratios. Test conditions for Task 2 are summarized in the table below.

Table 2: City of Buffalo Source Water Assessment Summary

Phase I Equilibrated Source Water	Phase 2 Source Water	Target Finished pH	Corrosion Control Products	Corrosion Chemical Dose (mg/L as PO4)	Number of Lead Coupons
100% ECWA	33%/67% Buffalo / ECWA	7.5	No Orthophosphate	0	1
	67%/33% Buffalo / ECWA			0	1
	100% Buffalo			0	1
100% ECWA	33%/67% Buffalo / ECWA	7.5	Orthophosphate (in the form H_3PO_4)	Optimal from Phase 1	1
	67%/33% Buffalo / ECWA			Optimal from Phase 1	1
	100% Buffalo			Optimal from Phase 1	1
100% ECWA	33%/67% Buffalo / ECWA	8.0	No Orthophosphate	0	1
	67%/33% Buffalo / ECWA			0	1
	100% Buffalo			0	1
100% ECWA	33%/67% Buffalo / ECWA	8.0	Orthophosphate (in the form H_3PO_4)	Optimal from Phase 1	1
	67%/33% Buffalo / ECWA			Optimal from Phase 1	1
	100% Buffalo			Optimal from Phase 1	1
				Total Jars:	12

Task 3 – Technical Memorandum Development

The Arcadis team will prepare a Technical Memorandum summarizing results from Tasks 1 and 2. Included in this document will be a comparison of previous scale analysis studies done for ECWA to coupon study results and appropriate recommendations for future corrosion control treatment activities.

PRELIMINARY WORK SCHEDULE

The Preliminary Work Schedule for this scope of work, based on Arcadis's receipt of authorization to proceed from ECWA in June 2019, is as follows:

Table 3: Preliminary Work Schedule

Milestones	Anticipated Completion Date*
Task 1 – Inhibitor Dose Screening	August 2019
Task 2 – City of Buffalo Source Water Assessment	September 2019
Task 3 – Technical Memorandum Development	October 2019

*Note dates are dependent on receipt of testing water from ECWA and Buffalo and stabilization of the coupons.

FEE

Arcadis proposes to complete the scope of work through the Special Services provisions of the Contract (i.e. Additional laboratory, demonstration, and/or pilot scale studies beyond the base scope assumptions). The proposed lump sum fee for these services is $75,000. Costs are predicated on the Scope of Services being completed in the time frames presented in the Preliminary Work Schedule above.

This proposal assumes that ECWA will be responsible for collecting and shipping the required volume of ECWA and Buffalo tap water to Cornwell Engineering Laboratory in Virginia. The costs for shipping water for Tasks 1 and 2 are estimated to be approximately $700.

Thank you for your consideration of this proposal. We look forward to working with ECWA towards continuing this successful project. If you have any questions or require additional information, please contact me at 716-316-5886.

Sincerely,

Mark Lenz, PE
Senior Vice President

Copies:
Russell Stoll, PE
Michael Wymer, PE

Erie County Water Authority - Optimal Corrosion Control Treatment Study - Special Services - Coupon Studies

	Arcadis								Cornwell Engineering Group											
	Lenz	Slabaugh	Salvagno	Gaskill					Cornwell	Brown	McTigue	Wagner								
	PM	Principal Eng	Project Eng	Project Assistant	Total Hours	Labor Total	Direct Costs (Travel)	Total Costs	Pres.	Sr. Proj. Engineer	Sr. Proj. Engineer	Project Engineer	Total Hours	Labor Total	Direct Costs (Travel)	Direct Costs (Analytical)	Direct Costs (Materials)	Total Costs	Total Hours	Total Costs
	$240	$196	$130	$120		($)	($)	($)	$240	$160	$150	$100		($)			($)	($)		($)
Project Management	2	8	0	4	14	$2,528		$2,528	2	6		0	8	$1,440				$1,440	22	$3,968
Inhibitor Dose Screening	2	8	8	0	18	$3,088	$0	$3,088	8	18	12	132	170	$19,920	$0	$2,500	$1,000	$23,420	188	$26,508
Conduct Coupon Studies, 30 Total		4	4		8	*$1,304*		*$1,304*	4	12	12	124	152	*$17,200*		*$2,500*	*$1,000*	*$20,700*	160	*$22,004*
Review of Coupon Studies	2	4	4		10	*$1,784*		*$1,784*	4	6		8	18	*$2,720*				*$2,720*	28	*$4,504*
City of Buffalo Source Water Assessment	2	8	8	0	18	$3,088	$0	$3,088	8	18	12	72	110	$13,920	$0	$1,200	$500	$15,620	128	$18,708
Conduct Coupon Studies, 12 Total		4	4		8	*$1,304*		*$1,304*	4	12	12	64	92	*$11,200*		*$1,200*	*$500*	*$12,900*	100	*$14,204*
Review of Coupon Studies	2	4	4		10	*$1,784*		*$1,784*	4	6		8	18	*$2,720*				*$2,720*	28	
Technical Memorandum Development	6	28	32	4	70	$11,568	$1,000	$12,568	20	18	0	40	78	$11,680	$1,500	$0	$0	$13,180	148	$25,748
Workshop - Review of Coupon Studies	2	16	16		34	*$5,696*	*$1,000*	*$6,696*	12	8		12	32	*$5,360*	*$1,500*			*$6,860*	66	*$13,556*
Draft Technical Memorandum	2	8	12	2	24	*$3,848*		*$3,848*	4	8		24	36	*$4,640*				*$4,640*	60	*$8,488*
Final Technical Memorandum	2	4	4	2	12	*$2,024*		*$2,024*	4	2		4	10	*$1,680*				*$1,680*	22	*$3,704*
Totals	12	52	48	8	120	$20,272	$1,000	$21,272	38	60	24	244	366	$46,960	$1,500	$3,700	$1,500	$53,660	486	$74,932

ERIE COUNTY WATER AUTHORITY
PROFESSIONAL SERVICES CONTRACT
AMENDMENT No. 1

Project No.	201700136	Contract No.	MP-079
Job No.		EC No.	
OWIP No.		Entered by/Date	jmf 07/30/2019

Title: Optimal Corrosion Control Treatment Study

Consultant: Arcadis of WNY, Inc.

Description of Change to Contract:
Increase 3D, Special Services.
Performing coupon studies based on recommendations provided in Arcadis draft report.
Scope of work in attached letter, dated June 28, 2019.
The coupon testing can be performed under Paragraph 2.B.1, Special Services of the Professional Service Agreement. Under that paragraph, additional laboratory testing is allowed

Reason for Change:
Additional funding is required to perform the coupon testing.

Compensation:
Revise 3D as follows:
Special Services: Increase by $75,000

APPROVED BY:

ARCADIS

Mark Lenz, PE — Date
Senior Vice President

Original Contract Amount	$223,000.00
Amendment No.1	$75,000.00
New Contract Amount	$298,000.00

ERIE COUNTY WATER AUTHORITY

Russell J. Stoll, PE — Date
Executive Engineer

Jerome D. Schad — Date
Chairman