SECOND AMENDMENT TO AGREEMENT

THIS SECOND AMENDMENT TO AGREEMENT ("Amendment") made and entered into as of this ____ day of May, 2016, amends the Agreement heretofore entered into between the CITY OF FRESNO, a municipal corporation ("CITY"), and Partners In Control Inc. DBA Enterprise Automation, ("CONSULTANT").

RECITALS

CITY and CONSULTANT entered into an Agreement dated August 6, 2015, for Installation and Integration of Vijeo CitectSCADA and Modicon Unity Pro PLC Software services for the Northeast Surface Water Treatment Facility, ("Agreement");

CITY and CONSULTANT now desire to modify the scope of work therein, by incorporating such additional services necessary to complete the upgrade and successfully meeting City system requirements.

AGREEMENT

NOW, THEREFORE, in consideration of the above recitals, which recitals are contractual in nature, the mutual premises herein contained, and for other good and valuable consideration hereby acknowledge, the parties agree that the aforesaid Agreement be amended as follows:

1. CONSULTANT shall provide additional services as described in **Attachment "A,"** attached hereto and incorporated herein by reference. Such additional services shall be completed within 100 days following execution of this Amendment by both parties.

2. CONSULTANT'S sole compensation for satisfactory performance of all services required or rendered pursuant to this Amendment shall be a total fee of $340,280.00.

3. In the event of any conflict between the body of this Amendment and any Exhibit or Attachment hereto, the terms and conditions of the body of this Amendment shall control and take precedence over the terms and conditions expressed within the Exhibit or Attachment. Furthermore, any terms or conditions contained within any Exhibit or Attachment hereto which purport to modify the allocation of risk between the parties provided for within the body of this Amendment, shall be null and void.

4. Except as otherwise provided herein, the Agreement entered into by CITY and CONSULTANT, dated August 6, 2015, remains in full force and effect.

IN WITNESS WHEREOF, the parties have executed this Amendment at Fresno, California, the day and year first above written.

CITY OF FRESNO,
A California municipal corporation

By_____

Name: Thomas C. Esqueda

Title: Director of Public Utilities

ATTEST:
YVONNE SPENCE, CMC
City Clerk

By:_____
Deputy

APPROVED AS TO FORM:
DOUGLAS T. SLOAN
City Attorney

By:_____ 5/3/16
Brandon M. Collet Date
Deputy City Attorney

Partners In Control dba Enterprise Automation, a California corporation

By:_____

Name: Josh Riley

Title: Vice President
(If corporation or LLC, Board Chair, Pres. or Vice Pres.)

By:_____

Name: Scott Pickford

Title: Secretary
(If corporation or LLC, CFO, Treasurer, Secretary or Assistant Secretary)

Addresses:
CITY:
City of Fresno
Attention:
Water Systems Manager
1910 E. University Ave.
Fresno, CA 93703
Phone: (559) 621-5314
FAX: (559) 621-488-1024

CONSULTANT:
Josh Riley
Attention:
Vice President
Enterprise Automation
210 Goddard
Irvine CA 92618
Phone: (949) 769-6000
FAX: (949) 769-6005

Attachment: Attachment "A"

Enterprise Automation
210 Goddard Irvine CA 92618 USA
Tel 949-769-6000 Fax 949-769-6005
www.eaintegrator.com

Attachment A

City of Fresno
EA15COF034 NE SWTF Upgrade
Change Orders for Phase 2 and 3

Date: 3/20/2016
Version: 1.00

Page	Name	Hours	Labor
1	Summary		
2	Valve Pair Removal	152	$27,209
4	Ladder Data Scraper	181	$32,404
6	IT Collaboration	106	$21,688
8	Ozone OITs	196	$35,411
10	Actiflo OIT	330	$60,618
12	Citect Issue Management	330	$59,068
13	Reporting	284	$53,882
	Contingency (City approval required before commencing work)		$50,000
Total			**$340,280**

ENTERPRISE AUTOMATION

Project Change Order

	Information trend - **no $ impact**
X	Scope change - **includes $ impact**

City of Fresno
NE SWTF controls upgrade
EA15COF034

Name: Valve Pair Removal CO

Date:	**3/20/2016**	**Author:**	Alex Stipe
Version:	**1.00**	**Reviewed by:**	James Parsons
			Scott Pickford

Justification for Project Change

During the investigation phase of this project it was found that the valve pairs for PCM-4, Ozone 1, and Ozone 2 contained unexpected command and request logic. In order to facilitate a complete valve pair removal, the logic needs to be reverse engineered and modified to meet the Rotork's specific valve control logic requirements. Additionally, PCM-4's valve pair was found to contain a PI control block which will need to be converted to an EA block during the conversion process. This work is out of scope from the initial project proposal since the project was quoted with the assumption that the valve pairs contained no such logic.

Description of Project Change

The changes require four steps that follow EA's standard project methodology. EA's engineering team will reverse engineer the logic by tracing all commands, requests, status, and setpoints from the Main PLC to the valve. The information gathered during the reverse engineering process will be compiled into an internal specification (design) (no customer submittal) which will guide the implementation phase of this CO. After the Main PLC program conversion is complete, the missing valve pair logic from PCM-4 and the Ozone generators will be added to the Main PLC program. Additionally, an EA standard PI block will be configured for PCM-4. Standard testing for the valve pairs was already included in the original proposal for this project but additional time is needed to test the new PI block.
Project management has been included to cover coordination, customer contact, project tracking, and scheduling.

Calculations

See attached estimate

Schedule Effect

Delay	
Advance	
None	X
Unknown	

Authorization required by: Immediate

Cost Estimate

Calculations above	
Attached estimate	X

Hours	**152**	
Dollars	**$27,209**	**T&M**

City of Fresno EA15COF034 NE SWTF Upgrade Change Orders for Phase 2 and 3
Valve Pair Removal

Group	Item	Hrs/Qty	Rate Classification	Location	Unit cost ($)	Total ($)
Reverse Engineering						
	PCM-4 (Limitorque x2)					
	PI block reverse engineering	4	Engineering	In-Office	$178	$712
	cmds/reqs to PCM-4 valve pairs	12	Engineering	In-Office	$178	$2,137
	LCP-21/22 (Limitorque x5/per Ozone system)					
	cmds/reqs to LCP-21/22 valve pairs	16	Engineering	In-Office	$178	$2,849
Design						
	PCM-4					
	PI block specification	6	Engineering	In-Office	$178	$1,068
	Rotork commands/requests	16	Engineering	In-Office	$178	$2,849
	LCP-21/22					
	Rotork commands/requests	16	Engineering	In-Office	$178	$2,849
Implementation						
	PCM-4					
	EA PI block implementation in Main PLC	4	Engineering	In-Office	$178	$712
	write Rotork valve logic per spec	16	Engineering	In-Office	$178	$2,849
	LCP-21/22					
	write Rotork valve logic per spec	40	Engineering	In-Office	$178	$7,123
Testing						
	PCM-4					
	PI block implementation in Main PLC	8	Engineering	In-Office	$178	$1,425
	<testing time already in existing scope>					
	LCP-21/22					
	<testing time already in existing scope>					
Subtotal		138				$24,574
Project Management	project management	14	Project Manager	In-Office	$188	$2,635
Expenses	general travel expenses	0	drive only (round trips)		$297	$0
		0	overnight trip (nights)		$260	$0
Total		**152**				**$27,209**

Project Change Order

	Information trend - **no $ impact**
X	Scope change - **includes $ impact**

City of Fresno
NE SWTF controls upgrade
EA15COF034

Name: Ladder Data Scraper CO

Date: 3/20/2016
Version: 1.00

Author: Alex Stipe
Reviewed by: James Parsons
Scott Pickford

Justification for Project Change

During Phase I of this project, it was found that the conversion process from Concept 2.5 to Unity created unpredictable errors in the logic sections of the PLC program. The original scope of this project contained some time for error correction during the conversion process, but that time did not account for the unpredictable and process critical errors which were discovered. Therefore, a tool must be used to analyze the immense amount of code in the Main PLC, Actiflo PLC, and Ozone PLCs post-conversion.

Description of Project Change

Due to the unpredictable nature of these errors and the significant risk they pose, a pre-existing EA tool called a *Data Scraper* will be used to analyze the PLC logic post-conversion. Previously, this tool was developed to test function block based PLC programs. Since the logic in the Main PLC consists mainly of ladder logic, this tool must first be adapted to work for ladder logic before it can be used. After the tool has been modified and tested, it will be used to compare the Concept 2.5 and Unity PLC programs for the Main, Actiflo, and Ozone PLCs. Issues must then be corrected.
Project management has been included to cover coordination, customer contact, project tracking, and scheduling.

Calculations

See attached estimate

Schedule Effect

Delay	
Advance	
None	X
Unknown	

Authorization required by: Immediate

Cost Estimate

Calculations above	
Attached estimate	X

Hours: **181**
Dollars: **$32,404** **T&M**

City of Fresno EA15COF034 NE SWTF Upgrade Change Orders for Phase 2 and 3
Ladder Data Scraper

Group	Item	Hrs/Qty	Rate Classification	Location	Unit cost ($)	Total ($)
Design						
	write specification for data extraction rules	6	Engineering	In-Office	$178	$1,068
Implementation						
	Data Scraper Development					
	write rules for Concept 2.5 data extraction	18	Engineering	In-Office	$178	$3,205
	write rules for Unity data extraction	18	Engineering	In-Office	$178	$3,205
	create Excel tool to eliminate known differences	4	Engineering	In-Office	$178	$712
	test data extraction rules	2	Engineering	In-Office	$178	$356
	Comparison					
	compare old and new Main programs	40	Engineering	In-Office	$178	$7,123
	compare old and new Actiflo programs	16	Engineering	In-Office	$178	$2,849
	compare old and new Ozone programs	16	Engineering	In-Office	$178	$2,849
	PLC Logic Corrections					
	correct Main program	16	Engineering	In-Office	$178	$2,849
	correct Actiflo program	8	Engineering	In-Office	$178	$1,425
	correct Ozone program	8	Engineering	In-Office	$178	$1,425
	Verify PLC Logic Corrections					
	verify Main program corrections	4	Engineering	In-Office	$178	$712
	verify Actiflo program corrections	4	Engineering	In-Office	$178	$712
	verify Ozone program corrections	4	Engineering	In-Office	$178	$712
Subtotal		164				$29,203
Project Management	project management	17	Project Manager	In-Office	$188	$3,200
Expenses	general travel expenses	0	drive only (round trips)		$297	$0
		0	overnight trip (nights)		$260	$0
Total		**181**				**$32,404**

Project Change Order

	Information trend - **no $ impact**
X	Scope change - **includes $ impact**

City of Fresno
NE SWTF controls upgrade
EA15COF034

Name: IT Collaboration CO

Date: 3/20/2016
Version: 1.00

Author: Alex Stipe
Reviewed by: James Parsons
Scott Pickford

Justification for Project Change

During the course of several years, Enterprise Automation has invested a significant amount of time training the SCADA IT department at the City of Fresno on the use of best practice virtualization and networking standards for the industrial automation industry. Due to personnel changes at the City of Fresno, additional verification, testing, and training time is necessary to ensure that the transfer to the new control system platform (virtual machines, servers, network, etc.) are configured correctly before EA engineers are deployed for commissioning.

Description of Project Change

Previously, the City of Fresno was going to take responsibility for commissioning the new control system platform without assistance from EA; thus no time was budgeted for it. This change request covers the time needed to plan for IT commissioning verification, execute the plan, and for travel to and from the NE SWTF for two EA engineers. The tasks listed on the attached estimate outline the specific IT systems that EA expects to verify. For each, a detailed procedure is required to insure the integrity of the installation.
The on-site commissioning verification is expected to take three days. Although we expect the City of Fresno to have all IT systems configured according to our design prior to the IT Verification, time has been allocated for EA to train and assist with configuration if necessary.
Note: IT infrastructure remains the responsibility of COF, EA is only scoped for assistance.
Project management has been included to cover coordination, customer contact, project tracking, and scheduling.

Calculations

See attached estimate

Schedule Effect

Delay	
Advance	
None	X
Unknown	

Authorization required by: Immediate

Cost Estimate

Calculations above	
Attached estimate	X

Hours: **106**
Dollars: **$21,688** **T&M**

City of Fresno EA15COF034 NE SWTF Upgrade Change Orders for Phase 2 and 3
IT Collaboration

Group	Item	Hrs/Qty	Rate Classification	Location	Unit cost ($)	Total ($)
IT Commissioning Prep						
	create procedure to verify IT infrastructure	12	Engineering	In-Office	$178	$2,137
	backup new platform VMs to external hard drive	0				
	<Already covered in existing scope>					
IT Commissioning						
	On-site tasks	60	Engineering	Out-of-Town	$188	$11,294
	copy new platform VMs to servers					
	verify installed hardware					
	verify datastore on ESXi and SAN					
	verify networking					
	verify firewall rules and remote access					
	provide assistance resolving problems found					
Travel						
	drive to and from NE SWTF (2 people)	24	Engineering	Out-of-Town	$188	$4,518
Subtotal		96				$17,949
Project Management	project management	10	Project Manager	In-Office	$188	$1,882
Expenses	general travel expenses	1	drive only (round trips)		$297	$297
		6	overnight trip (nights)		$260	$1,560
Total		**106**				**$21,688**

ENTERPRISE AUTOMATION

Project Change Order

	Information trend - **no $ impact**
X	Scope change - **includes $ impact**

City of Fresno
NE SWTF controls upgrade
EA15COF034

Name: Ozone OITs CO

Date: 3/20/2016
Version: 1.00

Author: Alex Stipe
Reviewed by: James Parsons
Scott Pickford

Justification for Project Change

Upgrading the Ozone OIT programs according to the manufacturer's upgrade path as originally scoped will result in programs that may not be upgradeable in the future, making the Ozone OITs obsolete much sooner than anticipated. To prevent obsolescence, EA will need to re-develop new Ozone OIT programs using the existing OIT programs as a reference. This would allow EA to provide a solution that is easily upgraded in the future. EA plans to use a Schneider Electric OIT so that NE SWTF can standardize on one vendor for PLCs, SCADA, and OITs.

Description of Project Change

The changes require four steps that follow EA's standard project methodology. EA will first reverse engineer the existing Ozone OIT program. A specification will then be written to incorporate the existing functionality into a new program. A new program will then be developed for a Schneider Electric Magelis OIT. After development is finished, the new program will be tested.
The original scope of work for the EA15COF034 NE SWTF Upgrade project includes time and budget for configuration, testing, and commissioning upgraded Ozone OITs, not OITs designed from scratch. This change request does not affect the commissioning budget but it does increase the testing budget because thorough testing is required. This change request supersedes the *Upgrade Ozone Generator OITs* section on page 11 of the original estimate.
Project management has been included to cover coordination, customer contact, project tracking, and scheduling.

Calculations

See attached estimate

Schedule Effect

Delay	
Advance	
None	X
Unknown	

Authorization required by: Immediate

Cost Estimate

Calculations above	
Attached estimate	X

Hours: **196**
Dollars: **$35,411** **T&M**

City of Fresno EA15COF034 NE SWTF Upgrade Change Orders for Phase 2 and 3 Ozone OITs

Group	Item	Hrs/Qty	Rate Classification	Location	Unit cost ($)	Total ($)
Investigation						
	reverse engineer existing OIT program	24	Engineering	In-Office	$178	$4,274
Design						
	write specification	50	Engineering	In-Office	$178	$8,904
	spec submittal	4	Engineering	In-Office	$178	$712
	post submittal changes	6	Engineering	In-Office	$178	$1,068
	update network drawings	2	Engineering	In-Office	$178	$356
Develop						
	OIT configuration tasks	100	Engineering	In-Office	$178	$17,807
	develop screens					
	configure security					
	configure communications					
	configure alarms					
	generate tags					
	develop reusable objects					
Testing						
	test screens	40	Engineering	In-Office	$178	$7,123
Subtotal		226				$40,244
Project Management	project management	23	Project Manager	In-Office	$188	$4,330
Credit to Existing PO	Upgrade ozone generator OITs	-48	Engineering			-$8,221
	Project management	-5	Project Management			-$941
Expenses	general travel expenses	0	drive only (round trips)		$297	$0
		0	overnight trip (nights)		$260	$0
Total		**196**				**$35,411**

ENTERPRISE AUTOMATION

Project Change Order

	Information trend - **no $ impact**
X	Scope change - **includes $ impact**

City of Fresno
NE SWTF controls upgrade
EA15COF034

Name: Actiflo OIT CO

Date:	**3/20/2016**	**Author:**	Alex Stipe
Version:	**1.00**	**Reviewed by:**	James Parsons
			Scott Pickford

Justification for Project Change

Contrary to what was expected when the original proposal was developed, COF does not have a complete development copy of the Actiflo OIT program, nor does the contractor that originally developed the Actiflo OIT. EA is therefore unable to upgrade the Actiflo OIT as originally scoped. Instead, COF has elected to remove the Actiflo OIT and move all of the program's functionality to the new Citect system.
This change increases the effectiveness of this system with minimal downside since the current local interface is not typically used for plant operation.

Description of Project Change

The changes require four steps that follow EA's standard project methodology. EA will first conduct an investigation to determine what content and functionality exists in the Actiflo OIT. This process will involve a workshop where two EA engineers will visit the NE SWTF for up to two days to interview staff and investigate the existing OIT. A design process will then be conducted to specify how the Actiflo OIT functionality will be incorporated into Citect. The process will involve updating the existing HMI Specification with the information necessary to fully define the Actiflo system's interface in Citect. Updates may include additional screens, new devices, updated navigation, and additional alarms. EA will then incorporate the new Actiflo functionality into Citect according to the design specification. Testing will be performed according to the existing EA15COF034 NE SWTF Upgrade proposal once development has finished.
The original scope of work for this project included time and budget for configuration, testing, and commissioning of an upgraded Actiflo OIT according to a pre-defined and manufacturer approved upgrade path. This change request requires a much different approach to the project and thus supersedes the existing *Upgrade Actiflo OIT* section on page 11 of the original estimate. Additional time for testing has been included. Project management has been included to cover coordination, customer contact, project tracking, and scheduling.

Calculations

See attached estimate

Schedule Effect

Delay	
Advance	
None	X
Unknown	

Authorization required by: Immediate

Cost Estimate

Calculations above	
Attached estimate	X

Hours	**330**	
Dollars	**$60,618**	**T&M**

City of Fresno EA15COF034 NE SWTF Upgrade Change Orders for Phase 2 and 3
Actiflo OIT

Group	Item	Hrs/Qty	Rate Classification	Location	Unit cost ($)	Total ($)
Investigation						
	reverse engineer existing OIT program	40	Engineering	In-Office	$178	$7,123
	workshop preparation	8	Engineering	In-Office	$178	$1,425
	workshop / field investigation	16	Engineering	Out-of-Town	$188	$3,012
	notes compilation	4	Engineering	In-Office	$178	$712
Design						
	update HMI Specification with Actiflo information	40	Engineering	In-Office	$178	$7,123
	reusable templates					
	screen definitions					
	update navigation					
	add alarms					
	update trends list					
	spec submittal	4	Engineering	In-Office	$178	$712
	post submittal changes	6	Engineering	In-Office	$178	$1,068
	update network drawings	2	Engineering	In-Office	$178	$356
Develop						
	SCADA configuration task additions					
	tag configuration	4	Engineering	In-Office	$178	$712
	unique process screens	108	Engineering	In-Office	$178	$19,232
	update existing screens	36	Engineering	In-Office	$178	$6,411
	SCADA standards	24	Engineering	In-Office	$178	$4,274
	navigation updates	8	Engineering	In-Office	$178	$1,425
Testing						
	additional testing	24	Engineering	In-Office	$178	$4,274
Travel						
	travel time to and from NE SWTF	24	Engineering	Out-of-Town	$188	$4,518
Subtotal		348				$62,375
Project Management	project management	35	Project Manager	In-Office	$188	$6,588
Credit to Existing PO	Upgrade ozone generator OITs	-48	Engineering			-$8,221
	Project management	-5	Project Management			-$941
Expenses	general travel expenses	1	drive only (round trips)		$297	$297
		2	overnight trip (nights)		$260	$520
Total		**330**				**$60,618**

Project Change Order

	Information trend - **no $ impact**
X	Scope change - **includes $ impact**

City of Fresno
NE SWTF controls upgrade
EA15COF034

Name: Reporting CO

Date: 3/20/2016
Version: 1.00

Author: Alex Stipe
Reviewed by: James Parsons
Scott Pickford

Justification for Project Change

The NE SWTF reporting system is a custom coded system. It has three reports that were custom built to get data from the existing FactoryLink system. These reports will no longer work when the new CitectSCADA system is deployed. These reports are needed by plant personnel, and were originally excluded from scope by the City.

Description of Project Change

1.) Monthly report, 2.) Sequence of events report, 3.) Graphs report
The three reports above need to be implemented to work with the upgraded NE SWTF control system (CitectSCADA and Wonderware Historian). EA will work with COF staff to review the report requirements and create a specification for the reports.
EA will use standard Microsoft SQL Server Reporting Service tools to develop the monthly report. This report will be available via a web page which can be viewed from business computers if required. This report is used to view 15 minute data for about 15 tags.
It is anticipated that the Wonderware Historian Client tools (iQuery and iTrend) will replace the sequence of events and graph reports. The Historian Client tools are the standard way this type of data is gathered/viewed on modern SCADA systems. The tools have much more advanced features available and are simply more flexible than the current custom reports. These tools will only be available on certain SCADA computers, and specifically not the COF business computers.
EA will perform testing of the new reports and reporting tools at EA. Due to the fact reports require data for at least a month, the testing at EA will only be preliminary. EA has included time to test the reports after at least one month of the production system being live, and again after two months. These tests will be performed remotely.
EA will create a simple training manual for the reports and the Historian Client tools. EA will hold a 2-3 hour training class during the deploy. The production system reports and reporting tools will be used during the training class. This change will be executed after the completion of the main project and these reports will not be available for the first few months following the main commissioning effort. Project management has been included to cover coordination, customer contact, project tracking, and scheduling.

Calculations

See attached estimate

Schedule Effect		**Cost Estimate**		
Delay		Calculations above		
Advance		Attached estimate	X	
None	X			
Unknown		Hours	**284**	
		Dollars	**$53,882**	**T&M**
Authorization required by	Immediate			

City of Fresno EA15COF034 NE SWTF Upgrade Change Orders for Phase 2 and 3 Reporting

Group	Item	Hrs/Qty	Rate Classification	Location	Unit cost ($)	Total ($)
Design						
	review current reports (3)	4	Lead Engineer	In-Office	$188	$753
	Monthly report					
	Sequence of Events					
	Graphs					
	setup test platform with Historian Client tools	8	Engineering	In-Office	$178	$1,425
	demo Historian tools to customer (join.me)	12	Lead Engineer	In-Office	$188	$2,259
	iTrend					
	iQuery					
	SSRS					
	report requirements workshop (join.me)	12	Lead Engineer	In-Office	$188	$2,259
	network design (reports on business network)	4	Lead Engineer	In-Office	$188	$753
	create report specification	24	Lead Engineer	In-Office	$188	$4,518
Configuration						
	SSRS monthly report	16	Engineering	In-Office	$178	$2,849
	SSRS or iQuery config for sequence of events report	8	Engineering	In-Office	$178	$1,425
	SSRS or iTrend config for graphs report	8	Engineering	In-Office	$178	$1,425
	report email setup	12	Engineering	In-Office	$178	$2,137
	test platform networking configuration	8	Engineering	In-Office	$178	$1,425
	setup business VM					
	setup routing for testing					
Testing						
	generate test documentation	24	Engineering	In-Office	$178	$4,274
	test reporting system	24	Engineering	In-Office	$178	$4,274
Commissioning						
	reporting system install	50	Lead Engineer	Out-of-Town	$198	$9,921
	report deployment					
	business PC software install (Hist Client)					
	report testing after month 1	8	Engineering	In-Office	$178	$1,425
	report testing after month 2	8	Engineering	In-Office	$178	$1,425
Training						
	create training manual	16	Engineering	In-Office	$178	$2,849
	training (including in deploy time)	0	Engineering	Out-of-Town	$188	$0
Travel						
	travel time to and from NE SWTF	12	Engineering	Out-of-Town	$188	$2,259
Subtotal		258				$47,651
Project Management	project management	26	Project Manager	In-Office	$188	$4,894
Expenses	general travel expenses	1	drive only (round trips)		$297	$297
		4	overnight trip (nights)		$260	$1,040
Total		**284**				**$53,882**