



BOARD OF SUPERVISORS AGENDA ITEM REPORT
CONTRACTS / AWARDS / GRANTS

☐ Award ☒ Contract ☐ Grant

Requested Board Meeting Date: 06/18/19

* = Mandatory, information must be provided

or Procurement Director Award ☐

***Contractor/Vendor Name/Grantor (DBA):**

Brown and Caldwell, Inc.

***Project Title/Description:**

Hydraulic Model and Capacity Management Support

***Purpose:**

Amendment: Contract No. CT-VW-16-298, Amendment No. Three (3). This amendment extends the term of the contract to 06/30/20, modifies the Scope of Services, and increases the contract amount by \$250,000.00 for a cumulative not-to-exceed amount of \$500,000.00. Administering Department: Regional Wastewater Reclamation.

***Procurement Method:**

Pursuant to Direct Selection authority of A.R.S. § 34-103, Requisition No. 215935 on 05/23/16, the Procurement Director awarded a contract for this project in the amount of \$100,000.00 for a contract term of 07/01/16 to 06/30/17. Previous Amendments Nos. One (1) and Two (2) totaling \$150,000.00 were approved by the Procurement Director to extend the contract term to 06/30/19 and change the consultant's address.

Attachment: Amendment No. Three (3).

***Program Goals/Predicted Outcomes:**

The major goals of this project are to develop calibrated models of the sub-regional wastewater collection systems (Avra Valley, Green Valley, and possible Corona) as well as to refine the calibration of the model for the Tucson metropolitan system.

***Public Benefit:**

The process for allocating wastewater capacity for new developments will be improved as will the validation of design projects to resolve identified bottlenecks in the various collection systems. As a direct result of this project, Regional Wastewater Reclamation Department (RWRD) will remain in compliance with its Capacity Management Operations and Maintenance (CMOM) permit.

***Metrics Available to Measure Performance:**

All models will be calibrated to within +/- 20% of actual wastewater flows, on average.

***Retroactive:**

No

10: COB-5-22-19
PJS-10
(11)

Contract / Award Information

Document Type: _____ Department Code: _____ Contract Number (i.e., 15-123): _____
Effective Date: _____ Termination Date: _____ Prior Contract Number (Synergen/CMS): _____
☐ Expense Amount: \$* _____ ☐ Revenue Amount: \$ _____

***Funding Source(s) required:**

Funding from General Fund? ☐ Yes ☐ No If Yes \$ _____ % _____

Contract is fully or partially funded with Federal Funds? ☐ Yes ☐ No

If Yes, is the Contract to a vendor or subrecipient? _____

Were insurance or indemnity clauses modified? ☐ Yes ☐ No

If Yes, attach Risk's approval.

Vendor is using a Social Security Number? ☐ Yes ☐ No

If Yes, attach the required form per Administrative Procedure 22-73.

Amendment / Revised Award Information

Document Type: CT Department Code: WW Contract Number (i.e., 15-123): 16-298
Amendment No.: Three (3) AMS Version No.: Thirteen (13)
Effective Date: 06/30/19 New Termination Date: 06/30/20
Prior Contract No. (Synergen/CMS): _____

☒ Expense or ☐ Revenue ☒ Increase ☐ Decrease Amount This Amendment: \$ 250,000.00

Is there revenue included? ☐ Yes ☒ No If Yes \$ _____

***Funding Source(s) required:** Regional Wastewater Reclamation Department Obligations

Funding from General Fund? ☐ Yes ☒ No If Yes \$ _____ % _____

Grant/Amendment Information (for grants acceptance and awards) ☐ Award ☐ Amendment

Document Type: _____ Department Code: _____ Grant Number (i.e., 15-123): _____
Effective Date: _____ Termination Date: _____ Amendment Number: _____
☐ Match Amount: \$ _____ ☐ Revenue Amount: \$ _____

***All Funding Source(s) required:**

*Match funding from General Fund? ☐ Yes ☐ No If Yes \$ _____ % _____

*Match funding from other sources? ☐ Yes ☐ No If Yes \$ _____ % _____

***Funding Source:** _____

***If Federal funds are received, is funding coming directly from the Federal government or passed through other organization(s)?**

Contact: Keith E. Rogers, Procurement Officer Keith E. Rogers 5/10/19 Tyler 5-10-19
Department: Procurement May 8 5/13/19 Telephone: 520-724-3542
Department Director Signature/Date: [Signature] 5/16/19
Deputy County Administrator Signature/Date: [Signature] 5/20/19
County Administrator Signature/Date: [Signature] 5/21/19
(Required for Board Agenda/Addendum Items)

PIMA COUNTY REGIONAL WASTEWATER RECLAMATION DEPARTMENT

PROJECT: HYDRAULIC MODEL AND CAPACITY MANAGEMENT SUPPORT

CONSULTANT: Brown and Caldwell, Inc.
2 North Central Avenue, Suite 1600
Phoenix, AZ 85004

CONTRACT NO.: CT-WW-16-298

AMENDMENT NO.: Three (3)

FUNDING: Regional Wastewater Reclamation Department Obligations

CONTRACT TERM: 07/01/16 - 06/30/17	ORIGINAL CONTRACT AMOUNT:	\$	100,000.00
TERMINATION PRIOR AMENDMENT: 06/30/19	PRIOR AMENDMENT(S):	\$	150,000.00
TERMINATION THIS AMENDMENT: 06/30/20	AMOUNT THIS AMENDMENT:	\$	250,000.00
	REVISED CONTRACT AMOUNT:	\$	500,000.00

CONTRACT AMENDMENT

WHEREAS, COUNTY and CONSULTANT have entered into the Contract referenced above; and

WHEREAS, COUNTY and CONSULTANT have previously agreed on Scope and Cost for Consulting Services; and

WHEREAS, as modeling services have progressed, the need for additional services, additional time and additional funding has become apparent; and

WHEREAS COUNTY and CONSULTANT have agreed to these modifications.

NOW, THEREFORE, it is agreed as follows:

CHANGE: **ARTICLE 1 – TERM AND EXTENSION/RENEWAL/CHANGES**, Paragraph 1, as amended in Contract Amendment No. Two (2):

FROM: "This Contract as approved by the Procurement Director commences on July 1, 2016, and shall terminate on June 30, 2019, unless sooner terminated or further extended pursuant to the provisions of this Contract."

TO: "This Contract as approved by the Procurement Director commences on July 1, 2016, and shall terminate on June 30, 2020, unless sooner terminated or further extended pursuant to the provisions of this Contract."

CHANGE: **ARTICLE 2 – SCOPE OF SERVICES**, as follows:

FROM: "CONSULTANT agrees to provide Hydraulic Model and Capacity Management Services for the COUNTY as described in APPENDIX A: SCOPE OF SERVICES (3 pages), an attachment to this contract."

TO: "CONSULTANT agrees to provide Hydraulic Model and Capacity Management Services for the COUNTY as described in **APPENDIX A: REVISED SCOPE OF SERVICES** (6 pages), an attachment to this contract."

CHANGE: ARTICLE 3 – COMPENSATION AND PAYMENT, Paragraph 1, as amended in Contract Amendment No. Two (2):

FROM: "In consideration of the services specified in this Contract, the COUNTY agrees to pay CONSULTANT Not To Exceed Two Hundred Fifty Thousand Dollars (\$250,000.00). CONSULTANT'S fees shall be as stated in Attachment 1 to APPENDIX A: FEE SCHEDULE (1 page), an attachment to this Contract. Hourly rates and all other rates included under this Contract shall remain fixed throughout the term of the contract. The COUNTY may consider adjustments to rates in connection with any extensions of the contract term."

TO: "In consideration of the services specified in this Contract, the COUNTY agrees to pay CONSULTANT Not To Exceed Five Hundred Thousand Dollars and Zero Cents (\$500,000.00). CONSULTANT'S fees shall be as stated in **Attachment 1 to APPENDIX A: REVISED FEE SCHEDULE** (2 pages), an attachment to this Contract. Hourly rates and all other rates included under this Contract shall remain fixed throughout the term of the contract. The COUNTY may consider adjustments to rates in connection with any extensions of the contract term."

REPLACE: **APPENDIX A: SCOPE OF SERVICES** (3 pages) with **APPENDIX A: REVISED SCOPE OF SERVICES** (6 pages); and

REPLACE: **Attachment 1 to APPENDIX A: FEE SCHEDULE** (1 page) with **Attachment 1 to APPENDIX A: REVISED FEE SCHEDULE** (2 pages)

This Amendment shall be effective 06/30/19.

All other provisions of the Contract, not specifically changed by this Amendment, shall remain in effect and be binding upon the Parties.

IN WITNESS WHEREOF, the Parties have affixed their signatures to this Amendment on the dates written below.

PIMA COUNTY:

Chairman, Board of Supervisors

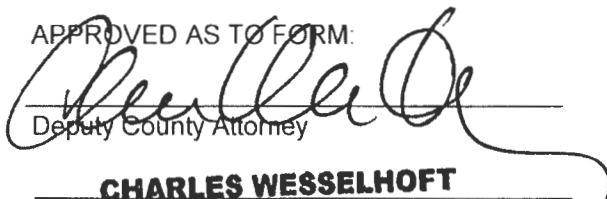
Date

ATTEST:

Clerk of the Board

Date

APPROVED AS TO FORM:



Deputy County Attorney

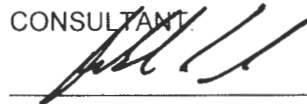
CHARLES WESSELHOFT

Name (Please Print)

MAY 15 2019

Date

CONSULTANT



RANDAL ARSLIN VICE PRESIDENT

Name and Title (Please Print)

5/16/19

Date

PROPOSED SCOPE OF PROFESSIONAL ENGINEERING SERVICES

PIMA COUNTY REGIONAL WASTEWATER RECLAMATION DEPARTMENT

Hydraulic Model and Capacity Management Support

Section 1 Background

Section 1.1 General

Pima County Regional Wastewater Reclamation Department (RWRD) manages a wastewater collection system comprised of approximately 3,600 miles of pipe, 75,000 manholes and several lift stations. The majority of wastewater flow is treated at the Agua Nueva and Tres Rios wastewater reclamation facilities (WRFs), with the remainder of the flow being treated at several sub-regional facilities.

RWRD has a fully-functional and calibrated hydraulic model of the metropolitan wastewater collection system that is tributary to the Agua Nueva and Tres Rios WRFs. The modeling software being used is InfoWorks ICM, developed by Innovyze. This modeling software affords RWRD with many tools, the two most obvious being the ability to identify current capacity issues and ability to effectively plan for anticipated growth. The model results are then integrated with the Wastewater Capacity Planning (WCP) software program, a proprietary program developed specifically for RWRD, and used as the basis for managing wastewater capacity requests for proposed developments. The WCP integration is done through the WCP Excel Analysis Tool, an Excel-based worksheet that incorporates VB coding to link model data to future capacity needs. RWRD has strived to re-calibrate the model every 3 to 5 years in order to account for new population growth and changes to the system.

To assist with model calibration and capacity assessment, RWRD maintains and deploys flow meters throughout the collection system. These meters record data measurements for various flow parameters, including velocity, depth, and temperature. The data is reviewed periodically to ensure accuracy and to determine if either equipment problems or capacity restrictions are developing.

Section 1.2 Purpose of Project

This project includes two primary purposes/tasks: 1) continued support capacity allocation and modeling efforts and 2) re-calibration of the metropolitan wastewater system model.

The consultant will be providing RWRD with additional support for business activities associated with capacity allocation and modeling efforts. RWRD staff will be further trained on the use of the hydraulic model as re-calibration efforts for the sub-regional wastewater systems (Green Valley, Avra Valley, and Corona de Tucson) are initiated. RWRD staff will also receive support in the use of the WCP tool. Knowledge of the WCP tool is critical for managing capacity requests and properly planning for future growth. In order to properly support both the model and the WCP, accurate flow data as well as asset information is required. The Consultant shall provide expertise as needed with flow meter placement and data review. Additionally, the Consultant shall provide

assistance with maintaining up-to-date GIS information of all wastewater assets needed to accurately model the collection systems.

The Consultant shall also perform the re-calibration of the metropolitan wastewater system model. This model was last calibrated in 2014 and 2015. The new calibration will be using the latest flow metering data, which has improved greatly since that time. Recalibration of the model also allows for the infrastructure changes that have occurred to be accurately reflected and for capacity allocations to be accurately managed.

Section 2 Scope of Services

The following paragraphs define the Consultant's scope of services for this project. In performing these tasks, the Consultant will rely upon information provided by RWRD and any other readily available information.

The Consultant shall provide qualified expert(s) whom previously have demonstrated success in developing collection system models using InfoWorks ICM. All model work is to be done in a collaborative relationship with RWRD staff.

A kickoff meeting will be held with the project team to outline the Scope of Services and discuss the overall goals of this phase of the project. Consultant shall prepare the minutes from the meeting for distribution to the attendees within five (5) working days of the meeting.

Task 1 - Support

This task includes continued support for the hydraulic model and the WCP tool, including the following tasks.

Model Maintenance and Support

The consultant shall assist RWRD staff in their effort to re-calibrate the models of the Green Valley, Avra Valley, and Corona de Tucson wastewater collection systems. This task will include assistance with analyzing flow meter data, updating model piping, resolving piping issues, actual model calibration, and maintaining the spreadsheet tools used to calibrate a model. This consultant will perform the following tasks:

- GIS update – Continue to update the model to the latest GIS information so the model reflects current system conditions.
 - Water billing data – Continue to assist RWRD staff in analyzing and importing water billing data into the model. The water billing data serves as the initial inputs for dry weather flow into the model.
 - CMOM Analysis – Assist RWRD staff in evaluating the response of the collection systems to rainfall events. This evaluation will assess the ability of the systems to accommodate a CMOM rainfall event, which is defined as a 10-year, 24-hour storm event per ADEQ. This assessment is required in order to comply with regulations.
 - Planning – Assist RWRD staff in using the model for planning exercises such as analyzing the growth from the University of Arizona. The model will also be used to perform 'What If' scenarios.
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Maintain WCP Tool

The Consultant will modify or customize the Excel Analysis Tool component of the WCP as necessary. In addition, the Consultant will help to maintain the WCP Tool and the Excel interface with the calibrated model results for sewer capacity tracking. The Consultant shall also provide training on the use of these different features.

Task 2 - Metropolitan System Model Calibration

RWRD shall deliver the following data prior to the model calibration:

- Latest model network with piping updated from the latest GIS information.
- Flow metering data for dry weather and wet weather calibration periods, along with a summary of the general accuracy of the data. RWRD will also list any significant changes to flow management structures that are known to have occurred since the last model calibration.

The Consultant shall calibrate the model, which includes the following tasks:

- Update the model dry weather flows using the latest water billing data. The consultant will sort and geocode the data as needed. If issues are found in the data, the consultant will discuss the issues with RWRD.
 - Perform dry weather calibration. This process will include:
 - Load the model with the updated water billing data.
 - Create sub-catchments (loading areas) for the entire metropolitan system.
 - Run the model for dry weather conditions and compare model results to sewer flow meter data.
 - Adjust model parameters to match sewer flow meter data.
 - Identify areas where the dry weather calibration does not match due to flow management structures. The consultant will submit to RWRD requests for drawings or survey data for those flow management structures. The flow management structures will then be updated in the model.
 - Iteratively run the model and repeat the above steps until acceptable matches are made between model flows and flow meter data.
 - Once a suitable dry weather calibration has been obtained, perform wet weather calibration, using at least 2 storm events (unless there are not sufficient storm events during 2018 and 2019). This process will include:
 - Request rain gauge data from the Pima County Flood Control District (PCFCD) and identify rain events. Data for the selected storm events will be formatted and imported into the model.
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- Run the model for the selected storm events and compare model results to sewer flow meter data.
- Adjust wet weather runoff parameters to match sewer flow meter data.
- Identify areas where the wet weather calibration does not match due to flow management structures. The consultant will work with RWRD on the flow management structures in the same manner listed above for dry weather calibration.
- Iteratively run the model and repeat the above steps until acceptable matches are made between model flows and flow meter data.

The flow meters used for calibration will include the meters selected by RWRD. Model calibration timeframes will be selected by RWRD and consultant staff based on a review of actual flow metering data from 2018 and 2019. The Consultant shall integrate the calibrated results into the WCP tool. GIS files representing flow meter location and flow management structures shall be updated.

CMOM Evaluation

Once a suitable wet weather calibration has been obtained, a CMOM analysis shall be conducted. The calibrated model will be used to assess the ability of the wastewater collection system to safely convey flow derived from a 10-year, 24-hour design storm. The design storm will be generated from NOAA Atlas 14 10-year, 24-hour rainfall totals for the area delineated by the metropolitan system. The design storm will include the PCFCD design storm hyetograph and any updates recommended by PCFCD.

Section 3 Estimated Fee

The not-to-exceed amount for this contract shall be \$500,000. The fee schedules are included in Attachment 1 to Appendix: A, Revised Scope of Services.

Section 4 Project Schedule

The proposed schedule (and completed tasks) to complete the work is:

Item	Start Date	Status
Kickoff Meeting	July 2016	Completed
General modeling support	July 2016	Continuing throughout contract
WCP support	July 2016	Continuing throughout contract
CMOM analysis	March 2017	Completed
Water billing analysis	April 2017	Completed
Winter quarter analysis	April 2017	Completed
Flow management structure review	March 2018	Completed
Flow meter site selection	May 2018	Completed
GIS Update	January 2019	Underway
Water billing data	July 2019	
CMOM analysis	July 2019	
Maintain WCP tool	July 2019	
Review/format flow data	August 2019	
DWF calibration	September 2019	
2020 GIS update	January 2020	
DWF calibration	February 2020	
CMOM analysis	May 2020	
Project completion date	June 30, 2020	

Section 5 RWRD Responsibilities

Responsibilities include, but are not limited to, the following:

- A Project Manager will be assigned to represent RWRD.
- The Project Manager will manage the contract, deliverables and invoices.
- The Project Manager will also supply the Consultant with copies of all relevant reports, studies, and other information to accomplish the project scope.
- The Project Manager will assist Consultant by coordinating RWRD staff attendance at all meetings and distributing all internal communications.
- The Project Manager will be the sole point of contact for all Consultant questions and requests.

ATTACHMENT 1 TO APPENDIX A: REVISED FEE SCHEDULE (2 pages)

Original Contract Period (7/01/2016 – 06/30/2017) Work Completed

Phase	Phase Description	Poppe, Mark A	Barnett, Candice L	Fugal, Andrew L	Skipper, Gary N	Bucasas, Rhonda R	Total Labor Hours	Total Effort
		PM	Project Analyst	Supervising Engineer	QA/QC	Accountant		
	<i>Rate</i>	<i>\$174</i>	<i>\$113</i>	<i>\$181</i>	<i>\$235</i>	<i>\$95</i>		
100	Project Management	30	20			20	70	\$9,380
200	Hydraulic Flow Model Support	24		240			264	\$47,616
300	Flow Monitoring Support	120			16		136	\$24,640
400	Capacity Management Support	8		80			88	\$15,872
	GRAND TOTAL	182	20	320	16	20	558	\$97,508

Amendment 1 Contract Period (07/01/2017 – 06/30/2018) Work Completed

Phase	Phase Description	Poppe, Mark A	Barnett, Candice L	Fugal, Andrew L	Skipper, Gary N	Bucasas, Rhonda R	Total Labor Hours	Total Effort
		PM	Project Analyst	Supervising Engineer	QA/QC	Accountant		
	<i>Rate</i>	<i>\$174</i>	<i>\$113</i>	<i>\$181</i>	<i>\$235</i>	<i>\$95</i>		
100	Project Management	15	10			10	35	\$4,690
200	Hydraulic Flow Model Support	12		120			132	\$23,808
300	Flow Monitoring Support	4		5	4		13	\$2,541
400	Capacity Management Support	4		100			104	\$18,796
	GRAND TOTAL	35	10	225	4	10	284	\$49,835

Amendment 2 Contract Period (07/01/2018 – 06/30/2019) Current Period

Phase	Phase Description	Poppe, Mark A	Barnett, Candice L	Fugal, Andrew L	Skipper, Gary N	Bucasas, Rhonda R	Total Labor Hours	Total Effort
		PM	Project Analyst	Supervising Engineer	QA/QC	Accountant		
	Rate	\$174	\$113	\$181	\$235	\$95		
100	Project Management	30	20			20	70	\$9,380
200	Hydraulic Flow Model Support	24		240			264	\$47,616
300	Flow Monitoring Support	40		26	4		70	\$12,606
400	Capacity Management Support	8		160			168	\$30,352
	GRAND TOTAL	102	20	426	4	20	572	\$99,954

Amendment 3 Contract Period (07/01/2019 – 06/30/2020) Work to be Completed

Phase	Description	Poppe, Mark A	Kitzrow, Candice L	Fugal, Andrew L	Skousen, Benjamin	Total Labor Hours	Total Cost
		PM	Project Analyst	Supervising Engineer	Engineer		
	Rate	\$181	\$135	\$181	\$153		
0	Project Management	70	70			140	\$22,120
100	Support						
a	GIS Update			80	40	120	\$20,600
b	Water billing data			80	20	100	\$17,540
c	CMOM Analysis			60	20	80	\$13,920
d	Planning			160	40	200	\$35,080
e	Maintain WCP Tool			60	13	73	\$12,849
200	Metropolitan System Model Calibration						
a	Review and Format Flow Metering and Rain Data			18	83	101	\$15,957
b	DWF Calibration			70	280	350	\$55,510
c	WWF Calibration			70	280	350	\$55,510
	GRAND TOTAL	70	70	598	776	1514	\$249,086

Notes: Candice Kitzrow was previously known as Candice Barnett. Candice and Mark received promotions so they have different rates for this amendment.