Form 9-1366
(May 2018)

U.S. Department of the Interior
U.S. Geological Survey
Joint Funding Agreement
FOR
Water Resource Investigations

Customer #: 6000000801
Agreement #: 19ZFJFA1600
Project #: ZF009GO
TIN #: 86-6000398

Fixed Cost Agreement YES[X] NO[ ]

THIS AGREEMENT is entered into as of the October 1, 2018, by the U.S. GEOLOGICAL SURVEY, Arizona Water Science Center, UNITED STATES DEPARTMENT OF THE INTERIOR, party of the first part, and the Cochise County party of the second part.

1. The parties hereto agree that subject to the availability of appropriations and in accordance with their respective authorities there shall be maintained in cooperation Water Resource Investigations (per attachment), herein called the program. The USGS legal authority is 43 USC 36C; 43 USC 50, and 43 USC 50b.

2. The following amounts shall be contributed to cover all of the cost of the necessary field and analytical work directly related to this program. 2(b) include In-Kind-Services in the amount of $0.00

(a) $34,500 by the party of the first part during the period October 1, 2018 to September 30, 2019

(b) $72,500 by the party of the second part during the period October 1, 2018 to September 30, 2019

(c) Contributions are provided by the party of the first part through other USGS regional or national programs, in the amount of:

Description of the USGS regional/national program: N/A

(d) Additional or reduced amounts by each party during the above period or succeeding periods as may be determined by mutual agreement and set forth in an exchange of letters between the parties.

(e) The performance period may be changed by mutual agreement and set forth in an exchange of letters between the parties.

3. The costs of this program may be paid by either party in conformity with the laws and regulations respectively governing each party.

4. The field and analytical work pertaining to this program shall be under the direction of or subject to periodic review by an authorized representative of the party of the first part.

5. The areas to be included in the program shall be determined by mutual agreement between the parties hereto or their authorized representatives. The methods employed in the field and office shall be those adopted by the party of the first part to insure the required standards of accuracy subject to modification by mutual agreement.

6. During the course of this program, all field and analytical work of either party pertaining to this program shall be open to the inspection of the other party, and if the work is not being carried on in a mutually satisfactory manner, either party may terminate this agreement upon 60 days written notice to the other party.

7. The original records resulting from this program will be deposited in the office of origin of those records. Upon request, copies of the original records will be provided to the office of the other party.

8. The maps, records or reports resulting from this program shall be made available to the public as promptly as possible. The maps, records or reports normally will be published by the party of the first part. However, the party of the second part reserves the right to publish the results of this program, and if already published by the party of the first part shall, upon request, be furnished by the party of the first part, at cost, impressions suitable for purposes of reproduction similar to that for which the original copy was prepared. The maps, records or reports published by either party shall contain a statement of the cooperative relations between the parties. The Parties acknowledge that scientific information and data developed as a result of the Scope of Work (SOW) are subject to applicable USGS review, approval, and release requirements, which are available on the USGS Fundamental Science Practices website (https://www2.usgs.gov/fsp/).

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9. Billing for this agreement will be rendered **quarterly**. Invoices not paid within 60 days from the billing date will bear Interest, Penalties, and Administrative cost at the annual rate pursuant the Debt Collection Act of 1982, (codified at 31 U.S.C. § 3717) established by the U.S. Treasury.

USGS Technical Point of Contact

Name:	Bruce Gungle Hydrologist
Address:	520 N. Park Ave Tucson, AZ 85719
Telephone:	(520) 670-3303
Fax:	(520) 670-5592
Email:	bgungle@usgs.gov

Customer Technical Point of Contact

Name:	Sharon Flissar Director of Public Works
Address:	401 Giulio Cesare Ave Sierra Vista, AZ 85635
Telephone:	(520) 458-5775
Fax:	
Email:	sharon.flissar@sierravistaaz.gov

USGS Billing Point of Contact

Name:	Rebecca Ramirez Budget Analyst
Address:	520 N. Park Ave Tucson, AZ 85719
Telephone:	(520) 670-3345
Fax:	(520) 670-5592
Email:	rramirez@usgs.gov

Customer Billing Point of Contact

Name:	Kimberly Ogden Chief Procurement Officer
Address:	City of Sierra Vista 1011 North Coronado Drive Sierra Vista, AZ 85635
Telephone:	(520) 439-2211
Fax:	
Email:	Kim.Ogden@sierravistaaz.gov

U.S. Geological Survey
United States
Department of Interior

Signature

By _____ **Date:** 12/17/2018
Name: James M Leenhouts ACTING
Title: Director

Cochise County

Signatures

By_____ **Date:** _____
Name:
Title:

By_____ **Date:** _____
Name:
Title:

By_____ **Date:** _____
Name:
Title:

Scope of Work

Agreement # 19ZFJFA1600, between USGS and Cochise County

For Federal fiscal year 2019 the funds from this agreement will cover ongoing hydrologic monitoring in the Sierra Vista Subwatershed of the Upper San Pedro Basin. This work has specific bearing on monitoring the hydrologic systen with respect to attaining a sustainable yield of groundwater withdrawals in accordance with the goals of the Upper San Pedro Partnership (http://www.usppartnership.com/press_mission.htm). In addition, the information obtained through this basic monitoring is critical to verifying the predictive performance of groundwater modeling of the Sierra Vista Subwatershed.

The cost of running the gaging stations and most of the other activities will increase by 2% ($2,100) from FY 2018. Th USGS will again contribute $34,500 to the agreement, or about 32% of the total cost. The specifics of the work are listed below.

Operation of the Lewis Springs study site (09470920). The Lewis Springs site, located just north of where Arizona Route 90 crosses the San Pedro River, has been operating about 24 years. This site has provided some of the most complete information available on the San Pedro River regarding interactions between the regional aquifer system and the perennial San Pedro River reaches. The long period of continuous record at this site makes it particularly valuable for detecting changes in effects of regional-aquifer pumping on the river. Instrumentation at the site includes 6 piezometers at three locations along a line extending perpendicularly away from the river. Two locations have nested piezometers that measure vertical hydraulic gradients from the regional to the stream-alluvium aquifer. The site also records stream stage so the hydraulic gradient to the river may be calculated.

Operation of tributary stream-gaging stations. Mountain-front, low-flow stream-gaging stations provide information about the amount of mountain-front recharge that is taking place in the Subwatershed. Flows result from both snow melt in the winter and spring, and from storm runoff during the summer months. Low-flow stream gaging also provides a means of assessing long-term climate change effects on the Subwatershed, if any. Major tributary stream-gaging stations help quantify the tributary contribution to San Pedro River surface flow.

a) The Banning Creek stream-gaging station (09470700) is located about a mile up Banning Creek toward Bisbee from the intersection of U.S. Routes 80 and 90 and is the only gaging station on the east side of the Subwatershed upstream of Walnut Gulch. Banning Creek is one of the larger watersheds in the Mule Mountains. The Banning Creek discharge record covers nearly 18 years, beginning in February of 2001. To visit the web page for this station navigate to:
http://waterdata.usgs.gov/az/nwis/uv/?site_no=09470700&PARAmeter_cd=00065,00060

b) The Ramsey Canyon stream-gaging station (09470750) is located in the Huachuca Mountains at the top of Ramsey Canyon Road, adjacent to The Nature Conservancy's Ramsey Canyon preserve headquarters building. Ramsey Canyon is one of a series of significant watersheds that drain the higher elevations of the Huachuca Mountains and is the southernmost gaging station on the west side of the Subwatershed. The Ramsey Canyon discharge record covers over 18.5 years, beginning in May of 2000. To visit the web page for this station navigate to:
http://waterdata.usgs.gov/az/nwis/uv/?site_no=09470750&PARAmeter_cd=00065,00060

c) The Upper Babocomari stream-gaging station (09471380) is located on the Babacomari Ranch about 4 miles west of Arizona Route 90. The Babocomari River is perennial in stretches and is the primary tributary stream in the Upper San Pedro basin. The Babocomari is essentially perennial at the Upper Babocomari gaging station. In combination with the Lower Babocomari gaging station (funded by other USGS partners), these

gaging station data help to quantify the contribution from the Babocomari River to the surface flow of the Sa Pedro River as well as to increase understanding of the groundwater – surface water interactions along the intervening reach of the Babocomari River. The Upper Babocomari discharge record covers about 18.5 year, beginning in July of 2000. To visit the web page for this station navigate to: http://waterdata.usgs.gov/az/nwis/uv/?site_no=09471380&PARAmeter_cd=00065,00060

Collection of stream samples and analysis of stable isotopes of water. The stable isotopes of water provide a sensitive indicator of water sources in a stream. Some of the funds in this agreement will be used to support an ongoing progran initiated in the mid-1990s at most locations to collect and analyze these isotopes. The collection locations along the San Pedro River are: Palominas (09470500), Hereford (312621110062601), Lewis Springs (09470920), Charleston (09471000), and Tombstone (09471550). Samples are also collected from the Babocomari River at the Lower Babocomari gaging station near Tombstone, AZ (station number 09471400). Samples are collected 8 to 12 months a year, depending upon conditions, and the procedure includes measurements of stream discharge. Collectively, these data provide valuable information regarding the interactions between the regional-aquifer system and the flow in the San Pedro River. In addition, the isotopes are used to look for changes in the relative sources of water to the stream as would occur if regional ground-water pumping captures water that would otherwise have supported base flow.

Spring discharge measurements. Groundwater discharges from the subsurface not only through the river streambed, bu also through various springs adjacent to the river. Discharge is to be measured quarterly at five springs, three along the west side of the river (Horsethief (313228110092701), 7 years beginning 2011; Murray (313425110102301), 15 years beginning 2003; and Moson Springs (313624110101401), 7 years beginning 2011) and two on the east side of the rive (Lewis Spring (313456110081901), 7 years beginning 2011; McDowell-Craig Farm flowing well (312502110060701) 7 years beginning 2011).

Data management and other activities. In addition to the activities outlined above, the USGS is engaged in other hydrologic monitoring activities including water level monitoring in wells throughout the Sierra Vista Subwatershed (continuous automated transducer measurements and manual quarterly measurements), vertical gradients monitored in paired deep and shallow piezometers near to the river and used to establish gaining and losing reaches of the river, and additional tributary and main stem stream gaging. All of these data need to be compiled, quality assured and controlled, and entered into the USGS national data base in a timely fashion. The USGS also participates in various Upper San Pedro Partnership meetings and activities throughout the year and responds to data and information request from Partnership members.

Budget for federal FY 2019

Agreement # 19ZFJFA1600, between USGS and Cochise County

Task	Cost item	Cost (in dollars)
Operation of Lewis Springs monitoring site	Data collection/site operation	17,700
Operation of Banning Creek stream gaging station	Data collection/site operation	17,700
Operation of Upper Babocomari stream gaging station	Data collection/site operation	17,700
Operation of Ramsey Canyon stream gaging station	Data collection/site operation	17,700
Collection of stream samples and analyses of stable isotopes of water	Labor Lab analyses Equipment Shipping	6,900 9,100 700 900
Spring discharge measurements	Data collection, 5 springs	6,300
Data management and other activities	Subwatershed data management/entry; data and information requests	12,300
	Total of project cost items	107,000

Funding source – USGS	34,500
Funding source – Cochise County	72,500
Total project funding	107,000