



April 19, 2013

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Cochise County Community Development Department
Highway and Floodplain Division
Attn: Karen Riggs, P.E., CFM, County Engineer
1415 West Melody Lane
Bisbee, AZ 85603

**RE: Cochise County ALERT System Implementation
Year 2 (FY 2012/13)**

Dear Karen:

Thank you for requesting a scope and fee from JE Fuller Hydrology and Geomorphology, Inc. (JEF) to continue to develop Cochise County's (County) ALERT flood warning system. The following is a scope of work for the referenced project. The purpose of this phase of the project is to provide installation and integration of additional remote precipitation sensors, as well as scheduled support services for components of the Cochise County ALERT system.

Scope of Work

General Description

The purpose of this Scope of Work (SOW) is to detail the tasks and fees associated with the second year of the Cochise County 5-Year ALERT System Plan implementation expected to occur during FY 2012-2013. Upon completion of this SOW, the County will have three (3) additional precipitation gages installed, and will have recommended routine maintenance performed for two (2) remote sensor/repeater stations and optional maintenance (if approved) for eight (8) additional ALERT stations owned by the Arizona Department of Water Resources (ADWR). The following paragraphs provide an outline of the expected efforts and fees associated with this phase of the project.

8400 S Kyrene Road, Ste 201
Tempe Arizona 85284
480.752.2124

40 E Helen Street
Tucson, Arizona 85705
520.623.3112

523 N Beaver Street
Flagstaff, Arizona 86001
928.214.0887

1 W Deer Valley Road, Ste 101
Phoenix, Arizona 85027
623.889.0166



Task 1: Design and Installation of Three (3) Remote Sensor Stations

JEF shall design, furnish, install, set up and calibrate three (3) remote ALERT precipitation sensor stations. This work also includes additional reconnaissance to the 3 new station locations, preparation of the FCC license applications, as well as coordination with other local, state and federal agencies and private land owners on the proposed location of the stations.

Unless otherwise noted, each remote ALERT sensor station will consist of a High Sierra Electronics (HSE) Model 3424-00 packaged rain gauge station that includes a standpipe assembly, 3306 ALERT data transmitter with 5-watt VHF data radio, 3 dB gain J-pole omni antenna, solar charging system, and lightning protection. Installation includes coaxial cable, connectors, grounding, and sealants. The station housings will be set in concrete approximately 2 ½ feet into the ground.

The remote stations to be installed shall include:

ALERT FY12-13 INSTALLATIONS

Site	Description
1	Near or within the Town of Bisbee
2	Near the City of Douglas
3	In the vicinity of Miller Canyon or Hunter Canyon in the Huachuca Mountain Range

Note that sites 1 and 2 in the table above were listed in the 5-Year Plan document, although recent interactions with County Staff have revealed preferences to examine locations other than those specific locations listed in the Plan. Site 3 in the table above was not included in the 5-year Plan document. Therefore, coordination and field reconnaissance will be required and performed prior to finalization of the locations for installation.

JEF will purchase, install, test and calibrate the installed equipment, and incorporate the new stations into the County’s network. Cochise County shall secure/provide permits, arrange for Blue Stake and provide traffic control during construction (as needed).



Task 2: Scheduled Maintenance (County-Owned Stations)

Routine scheduled preventative maintenance shall be performed once per year, at a minimum, to each remote sensor station owned and operated by Cochise County, to ensure proper operation of the ALERT system.

Scheduled maintenance at remote sensor stations shall take place during the early Spring prior to the advent of the Summer monsoon and shall include the following tasks:

- Remove battery and replace with freshly-conditioned battery,
- Calibrate and clean tipping bucket,
- Test/check solar panel charging system,
- Clean out funnel,
- Test radio/cable/antenna output/reflection,
- Test/calibrate stream stage sensor,
- Inspect all housing components for damage,
- Inspect grounding system,
- Paint touch up,
- Make minor repairs and/or adjustments such as re-sealing weather-tight connections, tightening loose fitting/fasteners, adjusting top section lock, etc. and
- Test overall data throughput and precision.

Cochise County currently owns and operates 2 ALERT remote stations (1 remote sensor station, 1 repeater station), as well as a base station computer. This scope of work includes maintenance to the 2 ALERT remote stations owned and operated by the county as well as continued operation and maintenance of the ALERT base station located at the offices of JEF (see below).

ALERT FY12-13 MAINTENANCE

Site	Description
1	Mule Mountain Repeater
2	West Turkey Creek Precipitation

This work does not include the cost to repair/replace major components but does include minor repairs. The deliverable for this task is a maintenance form for each site maintained and pertinent photo documentation.



Task 2 also includes maintenance of the ALERT base station for a period of 1 year, starting July 1, 2013, ending June 30, 2014. This service will include continued basic server maintenance/operation, DataWise software service and ALERT web-page hosting and training (when needed).

Task 3 (Optional): Scheduled Maintenance (ADWR-Owned Stations)

JEF recommends that the county work with ADWR to formally adopt existing ALERT stations in Cochise County and to take over their maintenance. It has been the practice by other counties in Arizona (Greenlee County, Pinal County) to perform maintenance on ADWR owned stations prior to formal adoption in order to assure continuous, reliable operation during the adoption period and to verify that the stations are fully operational at the time the stations are taken over. The attached table shows ALERT stations owned by ADWR located in Cochise County. All ADWR stations are overdue for recommended routine annual maintenance.

ALERT Station	ID	Last Maintained
Rucker	3050	8/25/2011
Portal	620	11/23/10
Dragoon	3060	11/24/10
Willcox	3070	8/25/11
Miller/Carr Canyon	3051	7/8/11
Ash Canyon	3052	7/9/11
King of Lead Mine	3080	8/26/11
Long Park	3090	8/26/11

The deliverable for this task is a maintenance form for each site maintained and pertinent photo documentation.



Fee Estimate

JEF will perform Tasks 1 and 2, providing labor, services, and materials as described above for a lump sum fee of \$34,347. The OPTIONAL Task 3 can be performed for an ADDITIONAL \$9,152 at the County's discretion.

A detailed fee table is attached.

Schedule

JEF will start the work immediately upon receipt of your notice to proceed. JEF will endeavor to complete the tasks by June 30, 2013, with the exception of the Task 2 ALERT base station operations and web-page hosting services, which will begin July 1st, 2013 and continue through June 30th, 2014.

Thank you again for requesting this Scope of Work and fee estimate from JEF. We are excited about continuing to provide services to the County that will advance towards the common goal of improving the County's flood warning capabilities.

Sincerely,

JE Fuller/Hydrology & Geomorphology, Inc.

Cyrus D. Miller, P.E., CFM
Vice President

Fee Estimate
Cochise County ALERT System
FY 2012/2013 System Installation/Operation/Maintenance

Labor Costs						
	Contract Task	BRI/CM (\$120/Hr)	CH (\$84/Hr)	TA/ER (\$54/Hr)	BC (\$90/Hr)	Totals
1	Design/Installation of Three (3) Remote Sensor Stations	80	0	85	15	\$15,540
2	Scheduled Maintenance (2 remote locations and base station)	8	0	12	0	\$1,608
3	Optional Station Maintenance (8 ADWR Stations)	45	0	45	0	\$7,830
TOTALS-Tasks 1 and 2		88	0	97	15	\$17,148
Direct Costs						
3-High Sierra Electronics Packaged ALERT Precipitation Stations, Including Shipping						\$12,524
Misc. Supplies: concrete, ground wire and rod, sealant, tape etc.						\$355
1-year base station operation/web page hosting						\$3,000
Tasks 1 and 2 Equipment and Services Direct Costs Total						\$15,879
Tasks 1 and 2 Travel Expenses		Mileage 1000 miles x \$0.72/mile				\$720
		Per Diem \$30 x 4 days x 2 people				\$240
		Hotel - 3 nights x \$120/night				\$360
Tasks 1 and 2 Travel Expenses Total						\$1,320
Task 3 Travel Expenses		Mileage 600 miles x \$0.72/mile				\$432
		Per Diem \$30 x 2 days x 2 people				\$120
		Hotel - 1 night x \$120/night				\$120
		ATV to access King of Lead and Long Park \$350/day				\$350
Optional Task 3 Supplies: 8 batteries x \$35/battery, sealant, tape etc.						\$300
Task 3 Travel Expenses and Other Direct Expenses Total						\$1,322
Tasks 1 and 2 Total Direct Costs						\$17,199
Tasks 1 and 2 Total Cost						\$34,347
Optional Task 3 Total Cost						\$9,152