

TO: James L. App, City Manager
FROM: Brad Hagemann, Water Resources Manager
SUBJECT: Rehabilitation of Fox, Cuesta, and Butterfield Wells
DATE: January 18, 2005

NEEDS: For the City Council to consider awarding a construction contract to rehabilitate three existing wells – Fox, Cuesta, and Butterfield.

- FACTS:**
1. The City periodically performs rehabilitation of its existing wells to insure that they perform efficiently and to extend their service.
 2. Via our Water Capital Improvement Program we have identified Fox, Cuesta, and Butterfield wells for rehabilitation this fiscal year.
 3. Construction documents for the project were completed and bids were secured.
 4. Fox, Cuesta and Butterfield Wells are proposed to be rehabilitated as follows:

Fox Well

The Fox Well, located at 3401 Dry Creek Road, was installed in 1996 as a line shaft turbine well, drilled to a depth of 1070 feet. Due to seasonal declining water levels, production for this well is restricted during the summer months. The declining water level causes the pump bowls to cavitate (suck air along with water) when operated at its current configuration. The cavitation causes the produced water to become milky in appearance, shortens the life of the pump bowls and is highly corrosive to the distribution system. In addition, operating the well in a cavitation mode is extremely inefficient and uses considerably more energy per gallon of water produced.

We propose to: remove the well pump and down-hole components (tooling); video inspect the well casing; clean well casing; re-video to ensure casing integrity; install new casing as needed (we are guarded optimistic that we will not need to install new casing and gravel pack since this well is relatively new); and install new pump, tubing and shaft. The new pump bowls will be sized such that cavitation will not occur during summer months resulting in a more reliable and energy efficient well.

Cuesta Well

The Cuesta Well, located at 2760 Buena Vista Drive, was installed in 1998 as a submersible well, drilled to a depth of 430 feet. Similar to the Fox well, the Cuesta well also cavitates during the summer months and was limited to only six hours per day of operation last year. Unfortunately the submersible pump assembly installed in 1998 is oversized which leads to the cavitation problem.

Again we propose to: remove the submersible pump and down-hole components (tooling); video inspect the well casing; clean well casing; re-video to ensure casing integrity; install new casing as needed (we are guarded optimistic that we will not need to install new casing and gravel pack since this well is relatively new); and install new pump, tubing and shaft. The new submersible pump will be sized such that cavitation will not occur during summer months resulting in a more reliable and

energy efficient well. In order to properly size the pump and avoid this situation in the future, staff obtained the services of Cleath and Associates, a hydrogeologic consulting firm, experienced in this area.

Butterfield Well

The Butterfield well, located at Golden Hill Road and Dallons Drive, was installed in 1966 as a line shaft turbine well, drilled to a depth of 775 feet. The well was equipped with a new pump, column, tubing and shaft in July 2003. The new down-hole equipment was sized to produce 500 GPM. However, last year production fell to 200 GPM by the end of September. The fact that the turbine pump is oversized for the capacity of the well again leads to inefficient operation and the likelihood of well cavitation.

A review of the video performed last spring indicated that the casing had enlarged perforations that could significantly affect well performance. As opposed to the Fox and Cuesta wells we anticipate that the Butterfield well will likely require new casing and gravel pack. A new higher resolution video inspection will determine whether new casing and gravel pack will be necessary.

This well is over 35 years old. We are unsure whether this well was originally drilled out of alignment or if has gone out of alignment due to age and natural circumstances. Regardless of the cause, the lack of alignment causes undo stress on the tube and shaft assembly. This increases operational costs while shortening the lifespan of the tooling on a line shaft type arrangement. A more appropriate design for an out-of-alignment well is a submersible pump and motor where the moving parts are located at suction level. We propose to install a submersible pump assembly into this well casing. We are designing the size of the pump assembly with the assistance of our consultants and based on the last two years of well yield data.

For the Butterfield well we propose to: remove the well pump and down-hole components; video inspect the well casing; clean well casing; re-video to ensure casing integrity; install new casing and gravel pack as needed; and install new submersible pump, tubing and shaft. The new submersible pump will be sized such that cavitation will not occur during summer months resulting in a more reliable and energy efficient well.

ANALYSIS

AND

CONCLUSION:

Bids were opened on December 9, 2004. Three bids were received, ranging from the low bid of \$274,291.59 to \$496,970.00. The low bid submitted by Aqua Engineering of San Miguel was reviewed and found to be a responsive bid.

POLICY

REFERENCE:

Water Capital Improvement Program

**FISCAL
IMPACT:**

Fox Well

Budget No. 600.910.5452.565 has been adopted for Fox Well. There is a balance of \$99,900. An additional \$40,000 is requested to perform the work. (Bid amount is \$137,487.10.)

Cuesta Well

Budget No. 600.910.5452.500 has been adopted for Cuesta Well. There is a balance of \$100,000. This is adequate to perform the work. (Bid amount is \$55,636.68.)

Butterfield Well

Budget No. 600.910.5452.351 has been adopted for Butterfield Well. Staff began the work on this well last year, but discovered it would require extensive work to perform rehabilitation. There are no funds left. It is proposed that an additional \$85,000 be appropriated. (Bid amount is \$80,367.81.) There are sufficient funds available from unallocated capital improvement funds collected from monthly service fees.

OPTIONS:

- a. Adopt Resolution No. 05-xx:
 - 1) Transferring \$40,000 of the existing budget appropriation from Budget Account No. 600-910-5254-500 to Budget Account No. 600.910.5452.565; and
 - 2) Appropriating an additional \$85,000 to Budget Account No. 600.910.5452.351; and
 - 3) Awarding a contract to Aqua Engineering to rehabilitate Fox, Cuesta, and Butterfield Wells for a not-to-exceed fee of \$274,291.59.
- b. Amend, modify, or reject the above option.

Attachments (2)

- 1) Resolution
- 2) Bid Summary

RESOLUTION NO. 05-

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF PASO ROBLES
AWARDING A CONTRACT TO REHABILITATE FOX, CUESTA, AND BUTTERFIELD

WHEREAS, rehabilitation of the City's wells would provide efficiency and extend their life service; and

WHEREAS, at the Bid Opening on December 9, 2004, three (3) bids were received ranging from \$274,491.59 to \$496,970.00; and

WHEREAS, the low bid submitted by Aqua Engineering of San Miguel in the amount of \$274,491.59 was reviewed and found to be a responsive bid; and

WHEREAS, an additional \$40,000 is required in Budget No. 600.910.5452.565 to rehabilitate Fox Well; and

WHEREAS, the budget appropriation for the Cuesta Well Rehab, Budget No. 600-910-5452-500, has \$40,000 more in budgeted resources than needed; and

WHEREAS, an additional \$85,000 is required in Budget No. 600.910.5452.351 to rehabilitate Butterfield Well.

THEREFORE, BE IT RESOLVED AS FOLLOWS:

SECTION 1. The City Council of the City of Paso Robles does hereby de-appropriate \$40,000 from Budget No. 600.910.5452.500.

SECTION 2. The City Council of the City of Paso Robles does hereby appropriate an additional \$40,000 to Budget No. 600.910.5452.565.

SECTION 3. The City Council of the City of Paso Robles does hereby appropriate an additional \$85,000 to Budget No. 600.910.5452.351.

SECTION 4. The City Council of the City of Paso Robles does hereby award the contract to Aqua Engineering of San Miguel in the amount of \$274,491.59 to rehabilitate Fox, Cuesta, and Butterfield Wells.

SECTION 5. The City Council of the City of Paso Robles does hereby authorize the City Manager to enter into a contract with Aqua Engineering of San Miguel in the amount of \$274,491.59 to rehabilitate Fox, Cuesta, and Butterfield Wells.

PASSED AND ADOPTED by the City Council of the City of Paso Robles this 18th day of January 2005 by the following vote:

AYES:

NOES:

ABSTAIN:

ABSENT:

Frank R. Mecham, Mayor

ATTEST:

Sharilyn M. Ryan, Deputy City Clerk

**Rehabilitation of
Fox Well No. 21, Cuesta Well No. 22, and Butterfield Well No. 12
DPW Project No. 04-30**

| | | Aqua Engineering San Miguel, CA | | Bakersfield Well & Pump Bakersfield, CA | | Maggiore Bros. Drilling Watsonville, CA | |
|------|--|------------------------------------|-------------------|--|-------------------|--|-------------------|
| ITEM | DESCRIPTION | UNIT | EXT. PRICE | UNIT | EXT. PRICE | UNIT | EXT. PRICE |
| 1 | MOBILIZATION | | 800.00 | | 7,120.00 | | 30,000.00 |
| 2 | FOX WELL NO. 21 | | | | | | |
| a | Remove Tooling | | 2,000.00 | | 2,500.00 | | 4,000.00 |
| b | Provide video inspection of well casing | | 1,850.00 | | 1,000.00 | | 1,360.00 |
| c | Clean Wells By: | | | | | | |
| i | Brushing | | 2,500.00 | | 2,500.00 | | 4,000.00 |
| ii | Chemicals | | 9,217.50 | | 6,000.00 | | 43,720.00 |
| iii | High Pressure Jetting | | 5,552.94 | | 13,700.00 | | 10,890.00 |
| d | Re-Video to determine method of repair | | 1,800.00 | | 1,000.00 | | 1,360.00 |
| e | Repair Casing: | | | | | | |
| i | Swage with Liner | | 4,752.94 | | 125.00 | | 9,320.00 |
| ii | Install 12-inch diameter casing with gravel pack to match existing | | 70,078.57 | | 113,770.00 | | 117,380.00 |
| f | Install Flo-way line-shaft turbine pump, column, tubing and shaft including two 1-inch diameter schedule 40 PVC tube for sounding and disinfection lines | | 39,735.15 | | 37,770.00 | | 43,370.00 |
| | FOX WELL NO. 21 | | 137,487.10 | | 178,365.00 | | 235,400.00 |
| 3 | CUESTA WELL NO. 22 | | | | | | |
| a | Remove Tooling | | 1,500.00 | | 2,500.00 | | 4,000.00 |
| b | Provide video inspection of well casing | | 1,850.00 | | 1,000.00 | | 1,360.00 |
| c | Clean Wells By: | | | | | | |
| i | Brushing | | 1,800.00 | | 1,540.00 | | 3,000.00 |
| ii | Chemicals | | 2,865.00 | | 5,000.00 | | 11,030.00 |
| iii | High Pressure Jetting | | 1,983.52 | | 4,000.00 | | 3,120.00 |
| d | Re-Video to determine method of repair | | 1,850.00 | | 1,000.00 | | 1,360.00 |
| e | Repair Casing: | | | | | | |
| i | Swage with Liner | | 4,752.94 | | 125.00 | | 9,320.00 |
| ii | Install 8-inch diameter casing with gravel pack to match specifications | | 19,542.85 | | 21,860.00 | | 26,850.00 |
| f | Install Flo-way submersible pump and column including two 1-inch diameter schedule 40 PVC tubing for sounding and disinfection lines | | 19,492.37 | | 18,615.00 | | 23,485.00 |
| | CUESTA WELL NO. 22 | | 55,636.68 | | 55,640.00 | | 83,525.00 |

**Rehabilitation of
Fox Well No. 21, Cuesta Well No. 22, and Butterfield Well No. 12
DPW Project No. 04-30**

| | | Aqua Engineering San Miguel, CA | | Bakersfield Well & Pump Bakersfield, CA | | Maggiora Bros. Drilling Watsonville, CA | |
|------|--|------------------------------------|----------------------|--|----------------------|--|----------------------|
| ITEM | DESCRIPTION | UNIT | EXT. PRICE | UNIT | EXT. PRICE | UNIT | EXT. PRICE |
| 4 | BUTTERFIELD WELL NO. 12 | | | | | | |
| a | Remove Tooling | | 2,200.00 | | 3,000.00 | | 4,000.00 |
| b | Provide video inspection of well casing | | 1,800.00 | | 1,000.00 | | 1,360.00 |
| c | Clean Wells By: | | | | | | |
| i | Brushing | | 2,000.00 | | 3,125.00 | | 4,000.00 |
| ii | Chemicals | | 4,530.00 | | 5,950.00 | | 24,090.00 |
| iii | High Pressure Jetting | | 5,058.00 | | 9,072.00 | | 7,200.00 |
| d | Re-Video to determine method of repair | | 1,850.00 | | 1,000.00 | | 1,360.00 |
| e | Repair Casing: | | | | | | |
| i | Swage with Liner | | 4,752.94 | | 125.00 | | 9,320.00 |
| ii | Install 8-inch diameter casing with gravel pack to match specifications | | 34,602.88 | | 49,217.00 | | 69,170.00 |
| f | Install Flo-way submersible pump and column including two 1-inch diameter schedule 40 PVC tubing for sounding and disinfection lines | | 23,573.99 | | 22,480.00 | | 27,545.00 |
| | BUTTERFIELD WELL NO. 12 | | 80,367.81 | | 94,969.00 | | 148,045.00 |
| | BID TOTALS: | | \$ 274,291.59 | | \$ 336,094.00 | | \$ 496,970.00 |