



# City of Woodland

## REPORT TO MAYOR AND CITY COUNCIL

AGENDA ITEM

TO: THE HONORABLE MAYOR  
AND CITY COUNCIL

DATE: February 16, 2010

SUBJECT: Construction Contract Change Order Authorization for Capital  
Projects, Water Well 22 (07-47) and Water Well 15 (08-32)

### **Report in Brief**

The City is currently drilling two replacement wells. On April 7, 2008, City Council authorized the award of a construction contract to Road Runner Drilling and Pump Co in the amount of \$965,556 for the replacement of the below ground facility of Well 15 and Well 22.

The State Department of Public Health (CDPH) is classifying these replacement wells as new wells and imposing more stringent water quality requirements than for the other existing wells. To comply with CDPH requirements the City will have to do more work and drill deeper than originally planned. City Code limits the total value of change orders to 25% of the contract award which is \$241,389 for this contract without additional approval from City Council. Change orders primarily for drilling Well 15 deeper have currently been issued in the amount of about \$185,000.

The water quality from each wells' separate water bearing zones were not known prior to drilling the test wells that are part of this contract work. Based on analysis of the water quality results from the test wells, additional work is required to meet the more stringent CDPH regulations. Both wells are being drilled approximately 200 feet deeper to reduce the effect of salt (specific conductance) which occurs in the shallower water bearing production zones. The test wells are also being drilled deeper. Collectively this extra work will, if approved, result in a final change order amount of about \$338,000.

Unit cost adjustment to well drilling contracts is common and essential to properly develop the well to the actual geological conditions. Once drilling starts up again on Well 22 it will be very expensive to hold up the driller's work to obtain subsequent additional authorization for change order work. Staff requests to have some uncommitted authorization to be able to adjust to actual field conditions as the well drilling progresses and requests the authorization for change orders be increase to a total of \$368,000.

Staff recommends that the City Council approve an increase to the Road Runner Drilling and Pump Co. construction contract change order authorization to a total change order limit of \$368,000 and a

total contract authorization amount of up to \$1,333,556; and increase Project Water Well 22 (07-47) funding by \$150,000 to \$1,100,000.

### **Background**

Well 15 is located in the northeast corner of Campbell Park along Colette Way and has a history of sand infiltration in excess of the allowable value, screen failures, and screen ruptures due to land subsidence. Well 22 is located in the southwest corner of Klenhard Park along East Gum Avenue and also has a history of sand infiltration in excess of functional limits.

Based on a cost-benefit analysis of the options of either replacing or rehabilitating these wells, City staff concluded that drilling new wells at the existing sites is the most economically attractive option of replacing these wells. The City is in need of these wells to meet peak day water use demands. In the near future the City will be building a 3 million gallon ground level tank with high capacity booster pumps to help meet peak hour demands and emergency flow requirements for the City. If either well cannot be constructed to meet CDPH standards then the tank project would need to be accelerated.

The drilling of the replacement well at Well 15 has been completed. This work included change orders in the amount of \$146,000. This well had to be drilled deeper than originally anticipated in order to meet the more stringent requirements of CDPH.

Staff is recommending that a deeper well also be drilled at Well 22. Council approval of an increase in the change order authorization is required before directing the Contractor to proceed with the deeper well drilling activities at Well 22. Well 22 is needed to meet water production capacity to serve the City. Before a deeper production well is drilled at Well 22 a deeper water sampling test well will be drilled. The water quality results of this test well will be analyzed by the consultant and staff, options will be considered by staff, and the City Manager will be briefed before proceeding with the drilling of this production well.

In addition to this well drilling contract, there is an existing second construction contract to install the above-ground piping, perform electrical work and re-install the pump and motor at each well upon the completion of the well drilling. This process was set up so wells could be brought back on line as soon as possible after the drilling was completed. The City Council approved the plans and specifications for this above-ground work and authorized bid advertisement on March 24, 2009. The City Manager was also authorized to award the construction contract. On September 21, 2009, the City Manager awarded the construction contract for the above ground facilities at these two wells to Flow line Construction in the amount of \$334,769.

Flow line Construction has started work at Well 15 to install surface piping and valves, re-install the well pump and motor and reconnect the electrical. They will perform the same work at Well 22 after the new Well 22 production hole is completed.

**Discussion**

In the past, the compliance level for the existing wells for salt as measured as Specific Conductance has been the upper level of 1600  $\mu\text{s}/\text{cm}$ . Each well’s water supply comes from a number of screened water bearing zones and they all have different water quality as it relates to minerals. City staff knows the blended water quality from each well as sampled when it comes out of the ground; however, staff does not know the water quality of the individual water bearing production zones. Since the City could not provide this information to the design consultant, Brown and Caldwell Engineering, Inc., the well drilling contract documents were set up to first require the drilling of discrete test wells to collect information from the likely water bearing zones. This information is then used to finalize the design of the production well and project the likely final blended water quality to meet CDPH standards.

The water well design plans were reviewed and approved by CDPH prior to bidding. CDPH is now treating replacement wells (even if they are right next to old well) as new wells. This means that CDPH is now permitting new/replacement wells only if they meet both the “Required Upper Level” and the “Recommended Level” standards. Before, when the City drilled a replacement well, only the higher Required Upper Level standard had to be met.

During water well drilling, the City obtains water quality testing and provides the results to CDPH. Upon completion of all water well construction, including disinfection of the well facilities, the City is required to submit the CDPH a final set of test results to show compliance with CDPH Title 22 standards. Once CDPH is satisfied that the well improvements and water quality is in compliance, then CDPH issues a permit to the City to operate the well and connect it the City system.

One of the problematic requirements for these wells has been the standard for specific conductance which is a measure of salt content in the water as indicated below:

<b>Constituent</b>	<b>Recommended Level</b>	<b>Required Upper Level</b>	<b>Short Term Level</b>
Specific Conductance ( $\mu\text{s}/\text{cm}$ )	900	1,600	2,200

Based on the initial groundwater quality test results for the wells it became evident that more data was needed and the test wells needed to be drilled deeper. Likewise, the production wells would also need to go deeper than anticipated in the design phase and this is the cause of significant increase in the Change Order amount.

Well 15 has already been drilled deeper resulting in substantially improved water quality. This deeper well has provided proper blending among the groundwater zones within the well to lower the salt level. Use of deeper well water zones has it limits too because the deeper water has manganese, arsenic and other minerals that are also regulated. There is a delicate balance of not using too much shallower water (to avoid salt and nitrates) and not using too much deep water (to avoid manganese,

arsenic and other minerals). In short, there are a lot of unknown factors that have to be addressed during both the design and the construction phases of well development.

Well 22 has had the initial test well drilled to a depth of 600 feet and the initial water quality results taken. The initial results show apparently excessive salt in the upper water zones so a deeper test well will be drilled to about 800 feet and likewise a deeper production well is likely. The plan is, similar to Well 15, to block off much of the shallower water zones and hopefully the deeper test wells will reveal suitable water that can be blended from lower water bearing zones. Initial results indicate that this may be more challenging to reach compliant water quality levels than it was for Well 15.

Due to other mineral problems at a deeper level, the City cannot reduce salt levels sufficiently by drilling deeper to meet the discharge permit requirements at the wastewater treatment plant without creating a whole new set of problems encountered by the additional potentially harmful minerals found at the deeper levels. These potential problems offset the fact that deeper water blending does appear to allow us to reduce salts enough to meet the drinking water CDPH requirements.

The State does not approve a well permit until after final production test results are submitted. Staff is continuing to meet and work with State CDPH staff on these issues. Staff is also actively involved with the City Attorney in the assessment of the permitting process.

The City has two options on how to proceed to complete the project. The recommended approach is to increase the contract authorization for the Road Runner Well Drilling contract. Staff believes that it is likely that this deeper water well will allow sufficiently improved water quality to be able to obtain CDPH approval to use these needed re-drilled wells. Therefore it is recommended to increase Project Water Well 22 (07-47) funding by \$150,000 to \$1,100,000.

As an alternative, the City could complete the well drilling contract work without drilling a deeper test hole or deeper production well at Well 22 although this would limit the City's ability to meet the State CDPH water quality requirements on specific conductance. It would also make it more difficult to meet peak day and peak hour water demands. The water quality samples obtained to date make it impossible to meet the regulatory requirement on specific conductance without the installation of reverse osmosis well head treatment.

After drilling Well 15 deeper than the original contract (via change orders), staff determined that water can be blended from the deeper aquifer zones to meet the State requirements. Preliminary cost estimates of the needed treatment improvements showed that deepening Well 15 has avoided reverse osmosis treatment that would have cost about \$3 million. There are also additional operational and staffing costs which have not been determined for this type of well head treatment. Therefore staff does not recommend this approach.

**Fiscal Impact**

The original project is fully funded in the current Capital Budget approved in the FY 2009 thru FY 2011 Capital Budget on June 10, 2008. The total project budget is now being increased from \$2,000,000 to \$2,150,000. The additional \$150,000 will be transferred from Project #-08-30 as an administrative adjustment within the Water Enterprise Fund. The change in appropriation between the two projects will be reflected in the Mid-year Capital Budget adjustments. All project costs are allocated to the Water Enterprise Fund; therefore, there is no impact to the General Fund.

**Public Contact**

Posting of the City Council agenda.

**Alternative Courses of Action**

1. Increase the Road Runner Drilling and Pump Co. construction contract change order authorization to a total change order limit of \$368,000 and a total contract authorization amount of up to \$1,333,556; and increase Project Water Well 22 (07-47) funding by \$150,000 to \$1,100,000.
2. Deny the increase and direct staff to complete the well drilling contract work without drilling a deeper test hole or deeper production well at Well 22 although this would prevent the City's ability to meet the State CDPH water quality requirements on specific conductance.
3. Provide alternate direction to staff.

**Recommendation for Action**

Staff recommends that the City Council approve Alternative No. 1.

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