

AGENDA ITEM #: _____

DATE: August 24, 2015

COAC #: 15-5646

**CITY OF GOODYEAR
CITY COUNCIL ACTION FORM**

**SUBJECT: APPROVE ENGINEERING
DESIGN WITH CAROLLO
ENGINEERS, FOR THE VADOSE ZONE
INJECTION WELL PROJECT**

**STAFF PRESENTER: Mark Holmes, P.G.,
Water Resources Manager**

**COMPANY CONTACT: Guy Carpenter,
Vice President, Carollo Engineers, Inc.**

RECOMMENDATION:

Approve the \$620,004.00 contract for the **Engineering Design and Construction Administration Services Contract** with Carollo Engineers, Inc. for the Vadose Zone Injection Well project of the Goodyear Water Reclamation Facility (WRF), and authorize the Purchase Order to be issued.

PURPOSE:

When the City's Soil Aquifer Treatment (SAT) recharge facility was identified as the City's future City Center location and decommissioned in 2008, an alternative recharge system was not implemented to allow the City to significantly benefit from its reclaimed water supplies by keeping water resources within the City nor enhancing its water resources portfolio. Long term storage credits, which are created by recharging reclaimed water underground within the aquifer, are one of the cornerstones of the City's designation of assured water supplies that provide replenishment for groundwater pumping, make the City more drought-proof, and allow for the indirect potable reuse of reclaimed water.

BACKGROUND AND COMMUNITY BENEFIT:

The City is currently treating large volumes of reclaimed water (40% of all water delivered in Goodyear's service area) or approximately 3,600 acre-feet per year of reclaimed water produced at the Goodyear Water Reclamation Facility. The amount of reclaimed water will increase through time with the expansion of this system associated with new growth. Reclaimed water is the City's renewal water supply that will continuously increase based on growth.

When the SAT site was decommissioned in 2008 the only disposal method for the City's reclaimed water treated at the Goodyear Water Reclamation Facility was sending it to the Palo Verde Nuclear Power Generating Station free of charge. This disposal method did not create any future water supplies for the City nor enhance the City's designation of assured water supplies. In the interim, the SAT site has been temporarily re-commissioned and is currently recharging all of the reclaimed water produced at the Goodyear Water Reclamation Facility creating significant value for the City. However, the SAT site type recharge system requires very large tracks of land. For example, the SAT site is 40 acres and had the permitted ability to recharge up to 4,500 acre-feet of reclaimed water per year. As this volume increases new lands would be required to recharge additional volumes of reclaimed water.

A permanent recharge solution has been developed utilizing Vadose Zone Injection Wells. The Vadose Zone Injection Well Project will allow the City to recharge its reclaimed water produced at the Goodyear Water Reclamation Facility back into the groundwater aquifer under the City via single points of recharge through injection wells. Injection wells do not require large tracks of lands and are constructed underground within a small vault system (these vaults are approximately 3' by 5' in dimensions) and can easily be concealed by landscaping. Also, injection wells allow for precise injection / recharge locations in consideration of superfund or other areas of land or groundwater concern and can be spread apart to minimize groundwater impacts. Injection wells have been very successful within Arizona and the Phoenix Metropolitan area whereby Phoenix, Gilbert, Chandler, Scottsdale, Peoria, Surprise, Fountain Hills, and Lake Havasu utilize injection wells.

Maximizing the City's benefit of this reclaimed water supply will ensure the highest level of sustainable management of the City's reclaimed water resources. To this end, recharging reclaimed water within the City will maximize the City's benefit and includes the following:

- 1) The reclaimed water would recharge and physically replenish water back to the same aquifer that is currently supplying the City's entire water supply. The water resources portfolio would receive long term storage credits for the entire volume of water that is recharged through this process.
- 2) Reclaimed water has and can continue to be used to meet replenishment obligations under current Arizona groundwater laws.
- 3) Reclaimed water has and can continue to be recovered for indirect potable reuse via permitted recovery wells and be served within the City's potable water supply system and thus not require any secondary purple pipe infrastructure operations, maintenance, or replacement costs of services.
- 4) Reclaimed water has significant water and financial value (today the value is approximately \$250 per acre-foot whereby in the near future the value could exceed \$1,000 per acre-foot) in that this water can be used in lieu of more expensive water supplies or leveraged for financial gains if properly replenished and there is a quantity determined to be excess.
- 5) Reclaimed water can be stored underground and used for future use in times of other water supply shortages i.e. the Colorado River and CAP shortages. This will ensure the City is working towards becoming drought proof. Therefore, if shortages do occur, the City can draw upon these reclaimed water long term storage credits to safeguard against impacts from shortages and not impact vital water uses or customers within the City.
- 6) Class A+ reclaimed water has better water quality characteristics compared to poor quality groundwater. By recharging reclaimed water that has better water quality characteristics than the existing poor quality groundwater, the overall water quality may improve enough through time whereby groundwater treatment costs could decrease for water production wells within a certain distance of the recharge system.

Proposed Project

There is an existing reclaimed water transmission main which extends from the Goodyear Water Reclamation Facility north along Estrella Parkway to Van Buren, east along Yuma Road to Bullard Ave, and north along Bullard Avenue to I-10 and interconnects with the Liberty Utilities reclaimed water system. This existing reclaimed water transmission main will become the backbone for delivering reclaimed water to the proposed vadose zone injection wells. These injection wells are being proposed within the east side right of way of Estrella Parkway from Van Buren south to Yuma Road and east along Yuma Road on the north side right of way.

The project was broken down into two phases:

Phase 1 – Develop a hydrologic model that can be used to determine the most ideal locations for the vadose zone injection wells for existing City owned or controlled lands near the reclaimed water backbone infrastructure. Also, use the hydrologic model to determine 10 and 20 year scenarios of reclaimed water injection to ensure permitting requirements and obtain all necessary permits.

Completed

- **The Arizona Department of Water Resources (ADWR) issued the final permit to the City on August 4, 2015.**
- **The Arizona Department of Environmental Quality has issued the City's permit.**

Phase 2 – Complete any necessary environmental assessments. Based on the best proposed hydrologic model location(s) begin the design and construction of the necessary injection wells infrastructure for recharging reclaimed water supplies.

- **The work to be completed by Carollo Engineering**

Additional Realized Benefits from Phase 1 Project Activities

1. The City's Designation of Assured Water Supplies (DAWS) was required to be renewed on or before December 31, 2014. The hydrologic model used for the vadose injection well system was also used for the City's DAWS renewal.
 - **Completed – ADWR is about to issue the City the Designation renewal permit.**
2. The hydrologic model was also used to evaluate the potential of increasing bulk water deliveries from the Adaman Water District from 4 million gallons per day to something up to 10 million gallons per day.
 - **Completed – The maximum amount of water that can be delivered from the Adaman Water District is 4.4 million gallons per day.**
3. There is a need to increase the legal pumping withdrawal amounts from City wells 18 and 22. This model was used to evaluate the amount of increased pumping and potential impacts as part of an application with the Arizona Department of Water Resources.
 - **Currently being evaluated by ADWR**

The multiple uses of the hydrologic model provided for an economy of scale and significant cost savings.

PREVIOUS ACTIONS AND DISCUSSION:

1. January 23, 2013 Council Meeting - Approved the submission of a grant application to the U.S. Department of Interior Bureau of Reclamation to help fund this project.
 - **The City was one of only two applicants to receive grant funding within all of Arizona from the United States Bureau of Reclamation. The City received a \$300,000 grant.**
2. September 9, 2013 Worksession - Overview of pertinent activities relating to the current method versus a proposed solution of a vadose zone injection well system for discharging reclaimed water from the Goodyear Water Reclamation Facility after the decommissioning of the Soil Aquifer Treatment recharge site.
 - **CIP Impact Fee carryovers were reallocated and transferred for this project.**

FISCAL ANALYSIS:

Total Project Budget - **\$ 2,835,000**

Completed Work: (September 2013 – June 2015)

Phase 1 – Completed Expenditures:

Brown & Caldwell Contract - \$ 250,000

- Hydrologic Model
 - Vadose Zone Injection Well Permits
 - Designation Renewal
 - Adaman Bulk Water
 - COG 22 & 18

Addendum 1 - Utilities Work \$ 68,246

Addendum 2 – Additional Hydrologic Modeling
to address PGA-S concerns \$ 25,000

Sub Total: **\$ 343,246**

New Proposed Work:

Phase 2 – Anticipated Expenditures:

a) Design & Construction Oversight –
Carollo Engineering \$ 620,004

b) Injection Wells & construction - \$1,871,750

Sub Total: \$2,491,754

ATTACHMENTS:

Contract between the City and Carollo Engineering