

SUBJECT

BOARD RESOLUTION NO. 22-896

Pertaining to an Amended and Restated Progressive Design-Build Agreement with CH2M Hill Engineers, Inc. for the McCarron's Treatment Process Improvements Project.

STRATEGIC PLAN GOALS: Infrastructure Strategy & Performance

Staff is seeking approval of an amended and restated agreement with CH2M Hill Engineers, Inc. for the McCarron's Treatment Process Improvements Project approved at the Board's January 12, 2021 meeting.

See attached Staff Report and Agreement.

RECOMMENDATION

Board approval is recommended.

McCarron's WTP Project

Staff Report: Guaranteed Price Agreement (Work Package 4)

Executive Summary: SPRWS staff and project partner, Jacobs Engineering, have reached a major milestone in by agreeing on a Guaranteed Price for approximately 95% of project work. Staff is seeking approval from the Board of Water Commissioners to move forward with the fourth work package for the project. The total value of the fourth work package is **\$170,165,742**.

SPRWS staff has worked with the Design-Builder to develop an Amended and Restated Contract. The Amended and Restated Contract does not substantively differ from the original contract for the project, but it does provide substantially more detail about the construction phase work.

Staff Recommendation Staff recommends approval of the Amended and Restated Contract.

Scope of Work

The scope of work for this work package is most completely described in Exhibit L7-5, Exhibit M, Exhibit P, and Exhibits Q1-Q5. The description provided herein is intended as a summary of the major components of the work.

The Scope of Work for this the Balance of Plant Package includes all work for the project except those items covered in the First Early Work Package, the Second Early Work Package, and the Third Early Work Package. Also excluded from the scope of the Balance of Plant Package is the work required to develop a new laboratory facility and office facilities, final landscaping and site restoration, and other end-of-project work.

The fourth work package, which the Board will consider today, includes approximately $\frac{3}{4}$ of the total project work. If approved, the Board will have contracted for about 95% of the overall project work.

A brief summary of the work to be performed is listed below:

- Providing staffing levels, materials, equipment, facilities, etc. required to perform all the work described below
- Construction of all Treatment Facilities and associated infrastructure
- Installation of all chemical tanks and chemical distribution infrastructure
- Construction of all sludge handling facilities within the project scope
- Installation of all electrical, plumbing, HVAC, etc. required to operate the facilities
- Programming of all new equipment, facilities, and operator controls required to operate the new facilities in conjunction with the existing facilities that will remain
- Startup and testing of the new facilities in accordance with the plans developed to demonstrate satisfactory performance
- The purchase of all bonds, insurance, etc. required to perform the work in accordance with the contract conditions

Pricing

The total value of the contract amendment is **\$170,165,742**.

\$151,468,636 is guaranteed to the Design-Builder as a Lump Sum value.

An additional **\$9,003,349** is available to the Design-Builder (upon Owner approval) for project risks encountered during the work (Contingency Funds).

Finally, an additional **\$9,693,757** is available to the Design-Builder (upon approval from the Owner) for Allowance Items. Allowance items are utilized for costs which may or may not materialize and for which the owner retains the risk.

Any unspent funds from the Contingency Fund and the Allowance Items will be returned to the Owner in full.

[Lump Sum vs. Guaranteed Maximum Price Delivery](#)

SPRWS staff recommends that the work be delivered via the modified Lump Sum arrangement utilized for Work Package 2 and Work Package 3. The selected approach invests staff resources (in the form of accounting oversight of the project) in precisely the areas where they're most likely to yield benefits for the owner, without dedicating resources to areas where opportunities for benefit are very limited. Further explanation of our rationale for this decision can be found in the **Additional Project Details** section that follows.

[Additional Project Details](#)

Attached to this staff report on the following pages is a more detailed overview of the project and its development over the course of the past year.

Additional Project Details

Reaching a Guaranteed Price for approximately 95% of the project work represents a tremendous milestone for the project. In light of reaching this milestone, the following information has been compiled as a summary of the development of the project.

Summary of Negotiation Efforts

In spite of the strong headwinds in the macroeconomic economic environment, SPRWS staff is confident that we have secured the best deal for the customers of SPRWS. Included below is a summary of the work that staff (with the assistance of the Owner's Representative) has done to with the Design-Builder.

Negotiated Reductions in Project Costs

Assembling price proposals for multi-year, complex projects is tremendously nuanced work. It's also work that must be done very quickly, especially in the current economy, since vendors, equipment suppliers, and subcontractors often only hold their pricing for a short period of time. Because of the complexity and speed of the undertaking, the first draft of the price proposal often includes some errors, omissions, and redundancies.

Further, such price proposals depend meaningfully on assumptions and estimates. For example, at the project outset, it's impossible to know exactly how many hours the construction superintendent will spend on the job or how much groundwater will be encountered. While the numbers used for estimating these variables are rigorously determined based on past project experience and field observations, there remains some subjectivity in determining the final number that drives pricing.

Finally, some items always come back with higher price tags than expected. Those unexpectedly large numbers show up in the initial price proposal for the work and are the impetus for scope changes to find more economical alternatives.

With the knowledge that price proposals are subject to error and subjectivity and that opportunities for substitution exist, SPRWS staff and the Owner's Representative team have been thorough in reviewing all price proposals submitted. During our review, we have managed to meaningfully reduce project costs. Below is a summary of the results of those efforts:

Work Package 1

SPRWS, the Owner's Rep., and the Design-Builder collaborated to reduce the cost of work package 1 by \$372,609

Work Package 2

SPRWS, the Owner's Rep., and the Design-Builder collaborated to reduce the cost of the Lump Sum scope by \$305,075. Further, we reduced the pool of funds available to the Design-Builder to cover risk events by \$256,606.

Work Package 3

SPRWS, the Owner's Rep., and the Design-Builder collaborated to reduce the cost of the Lump Sum scope by \$193,401. Further, we reduced the pool of funds available to the Design-Builder to cover risk events by \$688,713.

Work Package 4

SPRWS, the Owner's Rep., and the Design-Builder collaborated to reduce the cost of the Lump Sum scope by \$10,051,144. Further, we reduced the pool of funds available to the Design-Builder to cover risk events by \$1,210,987.

Total

Overall scope modifications, price proposal corrections, changes in assumptions, and negotiation efforts yielded a reduction of approximately \$11.8M to the Lump Sum Cost of the project. These same efforts also yielded a reduction of \$1.9M to the pool of funds available to the Design-Builder to cover risk events. These savings are significant because the Owner has guaranteed the Lump Sum portion of the work to the Design-Builder and, further, has limited control over the usage of the funds set aside to cover risk events.

Some of these savings were rolled into allowance items, which can be utilized at the Owner's discretion. A total of \$4,605,710M was added to the allowance items for the project. By adding funds to the allowance bucket, we've provided financial cushion for the project that makes a change order to increase costs less likely. Effectively, we've moved funds from guaranteed costs (lump sum costs) and likely costs (contingency costs) to an area where there's more owner-control over what is spent (allowance costs).

In total, negotiation efforts and scope adjustments resulted in a reduction of about \$9.8M in all anticipated project costs (lump sum savings + contingency savings – allowance additions).

It should be noted that these negotiation efforts are not principally a zero-sum effort. The Design-Build team was tremendously helpful throughout the process in developing cost-saving alternatives, evaluating ideas, and helping to minimize project scope as much as possible.

Modified Lump Sum Delivery

Generally speaking, there are two ways to deliver a Progressive Design-Build project – a Lump Sum approach and a Guaranteed Maximum Price approach. The option selected has a significant effect on who holds risks and who stands to gain from improved efficiencies.

Executive Summary – The Owner and the Design-Builder have collaborated to developing an approach to tracking project costs that we believe is very favorable to the Owner. The selected approach combines the best features of each standard means of delivery. Under the selected approach, costs that are known with a high degree of certainty will be fixed in price at the time of the contract signing. Costs that are estimated with less certainty will be tracked throughout the project to ensure that the Owner has an opportunity to participate in any savings. In short, the selected approach invests staff resources (in the form of accounting oversight of the project) in precisely the areas where they're most likely to yield benefits for the owner, without wasting resources in areas where opportunities for benefit are very limited.

Standard Lump Sum - Under a Lump Sum arrangement, the Design-Builder is guaranteed payment for all aspects of the project. Payment is guaranteed both for items that are highly certain and knowable at the project outset (i.e. the volume of concrete that will be required for the project) and for risk-related items that are highly uncertain and may or may not occur during construction (i.e. a longer-than-average winter season could lead to

construction delays and associated impacts.) The primary benefit to this arrangement for the Owner is that it guarantees the project price without requiring significant accounting effort throughout the project duration. The primary downside is that the Owner does not receive cost reductions if risks do not materialize; all such benefits accrue to the Design-Builder.

Due to the reduction in accounting-related overhead, the Design-Builder offered a discount of 0.6% (from 9.5% to 8.9%) on the Design-Builder's fee for any work performed under a Lump Sum arrangement.

Standard Guaranteed Maximum Price – Under a Guaranteed Maximum Price arrangement, a maximum price for the project is set and guaranteed by the Design-Builder but payments are made based on highly-detailed cost tracking and reporting throughout the project. The primary benefit for the Owner of a Guaranteed Maximum Price delivery is that the Owner only pays for work and risks that are actually performed and materialize. Meanwhile, the Owner retains assurances that the project costs will not exceed a certain value. The primary downside to this arrangement is that the level of effort required to track all expenses on a project of this size over the course of four years is tremendous and would require several highly-skilled staff members' full-time attention.

Due to the increase in accounting-related overhead in a GMP delivery, the Design-Builder's fee would be 0.6% higher (9.5% vs 8.9%) than the fee for a Lump Sum delivery.

Project Selection: Modified Lump Sum Approach – During the negotiation process, staff worked with the Design-Builder to develop an approach to incorporate some of the best features of both standard approaches. Under the selected arrangement, the Design-Builder is paid a Lump Sum amount for the aspects of the work that are known with a high degree of certainty. Because the bulk of the project falls into this category, taking a Lump Sum approach tremendously reduces the amount of administrative work required by SPRWS staff and secures the lower Design-Builder's fee for the majority of the work. Given the high degree of certainty associated with the costs included in the Lump Sum portion of the contract, it is our opinion that the opportunity to pick up savings by tracking all expenses was not substantial enough to merit the increased staffing and increased Design-Builder's fee on the project.

Under the Modified Lump Sum approach that we've developed with the Design-Builder, payment for risk-related items is not guaranteed. Because these aspects of the work are more uncertain, SPRWS staff determined that the opportunity to track costs was worth the additional administrative work and an increase in the Design-Builder's fee associated. We have reserved funds to cover risks that do materialize (i.e. damage to an existing facility), but the Design-Builder must provide evidence that the funds are needed and information about the cost of the associated work before they can access the funds.

Ultimately, the selected approach invests staff resources (in the form of accounting oversight of the project) in precisely the areas where they're most likely to yield benefits for the owner, without wasting resources in areas where opportunities for benefit are very limited.

Summary of Scope Changes

As macroeconomic headwinds have continued to buffet the project, SPRWS and the Design-Builder have worked together to modify scope to limit overall cost impacts. Below is a summary of scope changes that were made over the course of the design phase that added to or reduced project costs. As shown below, additions to scope have been limited to a few areas. While the three scope additions have contributed to the growth in project costs, they have been offset in large part by scope reductions. On the whole, cost growth for the project has been mostly attributable to macroeconomic factors outside of the control of SPRWS or the Design Builder.

Changes to Scope that Added Costs

- Elected to add a new lime handling facility, including new lime storage, slaking, dosing, etc.
- Elected to add new chemical storage facilities for primary and secondary coagulants
- MDH required underdrain system around facilities

Changes to Scope that Reduced Costs

- Made many changes to preferred materials for construction to move away from materials that have been especially impacted by supply chain issues and cost increases
- Changed requirements for electrical wiring routing to use more cost-efficient materials and methods
- Optimized construction schedule to gain efficiencies
- Removed some costly architectural features that have only aesthetic impacts
- Removed windows in areas where they offer limited benefits
- Removed costly lighting on the perimeter roadway for which the benefits did not justify the costs
- Changed actuator mechanisms for certain valves from electrical to mechanical
- Adjusted building footprints to maximize common-wall construction
- Removed an underground walkway valued at \$400k
- Eliminated redundancy in ozone generation since we can operate without ozone for a while
- Chose shorter routing for piping from recarb/ozone basins to filters

Summary of Project Cost vs. Relevant Indices

In April of 2021, we received the cost estimate for the project that was based on the 10% design for the project. At that time, the cost estimate for the project was \$178.8M. Currently, the estimate for the project stands at \$235M. The purpose of this section is to compare the increases of the project cost to current macroeconomic trends.

The St. Louis federal reserve publishes a variety of price indices that can be used to gauge the overall change in market conditions. All references to indices below are based upon indices published by the St. Louis federal reserve.

New Industrial Building Construction

Source: <https://fred.stlouisfed.org/series/WPU801104#0>

From April of 2021 to April of 2022, the costs of new industrial building construction rose by 23%. This compares to a 28.7% cost increase in the cost of the water treatment plant project. Our cost increases have been 5.7% higher than what would be predicted by the index. As described below, the project's reliance on several key commodities that have seen larger increases in costs may be the reason for the difference between the project's cost increases and the increases shown by the index.

Stainless Steel

During the same time period, the price of stainless steel rose by 43.7%. Stainless steel is a major component of the project since it is the best material to utilize for equipment that will be in regular contact with water and/or chemicals for most of its lifespan. The increase in the price of stainless steel has had a significant impact on project costs.

Steel Pipe

During the same time period, the price of steel pipe has risen by 42%. There are several large steel pipelines in the project.

Plastic Pipe

Due to the rise in steel pipe costs, we have considered alternative materials. Unfortunately, these materials have also been subject to tremendous growth in costs. Plastic pipe, for example, has risen by 74.6%. These increases have continued to make steel piping the best value for the project in spite of the substantial cost increases.

Precast Concrete Wall Panels

The project relies heavily on precast concrete wall panels, which have increased in cost by 22.5% since the 10% estimate was compiled.

Overall Conclusions

These indices provide an incomplete picture of the overall macroeconomic environment in which the project is being undertaken. For many project components, there is no relevant index available for comparison. Taken together, however, the information summarized above leads SPRWS staff to conclude that cost increases for the project have been generally in line with what might be expected based on macroeconomic data. While we've seen the costs of our project grow by more than the industrial building construction index, we believe that the difference can be reasonably attributed to several factors:

- Heavy reliance on materials like stainless steel and steel pipe that have seen larger cost growth
- The added complexity of building in close proximity to existing facilities
- The specialized nature of equipment required to complete the project (many water-industry specific products are supplied by only a small number of vendors)

Summary of Approach to Escalation and Risk

As discussed at the May 2022 Board meeting, SPRWS has retained various risks that fall outside of the control of the Design-Builder.

Some of these risks are commonly retained by the Owner during construction projects. Examples of this include the risk of Owner-directed changes to scope, the risk of pre-existing contamination of subsurface materials, or the risk of force majeure (natural disasters, terrorism, etc.)

Due to the macroeconomic environment, we have also elected to retain the risk of cost escalation related to certain materials. Below is a summary of the items for which endline suppliers and vendors were unwilling to guarantee pricing based on current macroeconomic trends:

- Items to be procured by Design-Builder: A total of 16 items/equipment packages were subject to escalation risk. The total value of these packages was about \$5M (without any escalation)
- Subcontractor work packages: A total of 16 subcontractor packages were subject to escalation risk. The total value of these packages was about \$30M (without any escalation).

Tracking escalation for this many items would be tremendously labor intensive and challenging. As such, SPRWS negotiated a risk buyout deal with the Design-Builder. Under the risk buyout arrangement, SPRWS will retain escalation risk for 8 of the 32 total packages that are subject to escalation. The Design-Builder will take on the escalation risk in the other 24 packages.

In exchange for taking on the escalation risk for the 24 packages, SPRWS has guaranteed the Design-Builder a payment of \$1.6M. This \$1.6M payment was offset, in part by a reduction of \$250k in contingency funds, making the true cost of the risk transfer equate to \$1.35M. The total cost basis for the 24 packages in question is approximately \$12.5M, so the payment constitutes a risk premium of around 11 percent.

The risks that SPRWS will retain under the negotiated arrangement are summarized in Exhibit L5. These risks do constitute the most substantial escalation risk. SPRWS carrying about \$3.3M in funds to account for potential escalation in the cost of these items in the coming months. We have specifically chosen to retain the risk for these items because the risk premiums offered were judged to be too high, the size of these work packages is deemed to be sufficiently large to justify the detailed tracking that will be required, and SPRWS and the Design-Builder were able to set clear boundaries that define which risk the Owner retains.