

Council Study Session

August 5, 2019

Agenda Item	Update on Preliminary Design of a 7.5 MGD Water Treatment Plant	
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Item Type	Requested by Council <input checked="" type="checkbox"/> Update <input type="checkbox"/> Request for Direction <input type="checkbox"/> Presentation <input type="checkbox"/>	

SUMMARY

Before the Council is an update on phase one preliminary engineering for the new 7.5 million gallons a day water treatment plant (7.5 MGD WTP). Council chose to move forward with the engineering and construction of a new 7.5 MGD WTP based on engineering analysis that detailed improvements and risk reduction measures to the existing plant that would not be sufficient to fully mitigate all risk. Council awarded the phase one preliminary engineering contract to HDR Engineering, Inc. at the September 18, 2018 Council meeting.

POLICIES, PLANS & GOALS SUPPORTED

City Council Goals:

Goal 1: Develop current and long-term budgetary resilience

- Continue to improve the budget process: transparency, rigor, innovation, community involvement, and collaboration
- Evaluate revenue streams

Goal 2: Analyze City departments/programs to gain efficiencies, reduce costs and improve services

Goal 3: Enhance and improve transparency & communication

- Develop a robust program to engage with Ashland citizens about City priorities and our progress on those priorities, public input opportunities and processes, how individual citizens can help meet City goals, budgeting and decision-making processes, etc.

Maintain Essential Services-Drinking Water

Continue to leverage resources to develop and/or enhance Value Services

Department Goals:

- Maintain existing infrastructure to meet regulatory requirements and minimize life-cycle costs
- Deliver timely life cycle capital improvement projects
- Maintain and improve infrastructure that enhances the economic vitality of the community
- Evaluate all city infrastructure regarding planning management and financial resources

BACKGROUND AND ADDITIONAL INFORMATION

The 2012 Water Master Plan prioritized a capital improvement plan related to water infrastructure. One of the recommended and approved projects was development of a 2.5 MGD water treatment plant to meet projected peak capacity requirements by 2018 and then slowly expand the plant to a 10 MGD; the ultimate capacity and phase out of the existing WTP. Since development of the water master plan, numerous things have changed that required a fresh look at proposed water infrastructure projects. For example, the Public Works Department had a change in leadership that required a formal review of the complete capital improvement program, the Talent Ashland Phoenix (TAP) intertie and pump station were completed giving

the City an emergency redundant supply and original demand projections have not been realized requiring an additional 2.5 MGD of treatment capacity.

At the November 6, 2017, Council Study Session ([staff report](#)), Public Works staff proposed to suspend preliminary engineering for the 2.5 MGD water treatment plant to perform a comprehensive cost comparison of building a new 7.5 MGD water treatment plant versus utilizing and upgrading the current plant to fully meet the needs of Ashland into the future. Staff contracted with RH2 Engineering and Black and Veatch to perform the assessment and details were provided to the Council at the April 2, 2018 Business Meeting ([staff report](#)).

In short, the engineering team of RH2 and Black & Veatch determined the existing plant could not fully overcome the risks associated with seismic stability, flooding, and ensuring capacity for potential future regulatory requirements without rebuilding the WTP. The existing plant could be modified and updated one element at a time, but in the end, short of a full rebuild, the overall risks remain. The City would still be operating in a less than desirable location which is also prone to wildfire and localized landslides. Building a second 2.5 MGD plant for redundancy did not solve the risks as the existing plant.

After a desire was expressed to move forward with engineering for a new 7.5 MGD water treatment plant to fully meet the needs of the future and to mitigate risks at the existing plant, staff prepared a solicitation package and formally selected HDR Engineering, Inc. to develop plans, specifications, and estimates for the new plant. The solicitation was broken into four distinct phases that included preliminary engineering, final engineering, bidding assistance, and construction administration. Council awarded a contract to HDR for phase one preliminary engineering at the September 18, 2018 Business Meeting ([staff report](#)).

The goals of the new WTP project include development of a reliable, simple, robust, energy efficient, and expandable water treatment plant. City staff has worked with the HDR team to develop 30 percent design documents and cost estimates.

Design Development and Workshops

City staff and HDR have held four onsite workshops to select a treatment process from several primary alternatives, develop conceptual site layouts, analyze storage requirements, analyze alternative energy sources (solar/hydro), develop onsite and offsite piping connections, and develop initial cost estimates. The general process is detailed in the Basis of Design Report (BoDR) linked underneath the References section. The first workshop held on October 11, 2018, involved site confirmation and presentation of alternatives for the treatment process, selection of two preferred treatment process alternatives for further analysis and initial costing. Work done previously had vetted site locations and the Granite Pit site was selected as the preferred option for the new water treatment plant and was validated again.

The second workshop was held on January 23, 2019, and involved the selection of the preferred treatment process alternative, general site layout of major components, pipeline requirements, hydro and solar power options, and onsite storage. The preferred treatment alternative selected was ozone pretreatment, flocculation, sedimentation, and filtration (reference Figures 1 and 2 below). The current water treatment plant is a direct filtration plant that operates via chemical addition, flocculation formation, filtration, and chlorine disinfection before entering the distribution system. The proposed new water treatment plant is a conventional filtration plant. Two new treatment steps are added when compared to the old plant. Additional steps include ozone treatment and sedimentation that create a more robust overall treatment process. Ozone is a powerful oxidant that is used to remove taste and odor compounds and destroy algae. Sedimentation is used to remove solids prior to filtration providing better filter performance.

Figure 1:

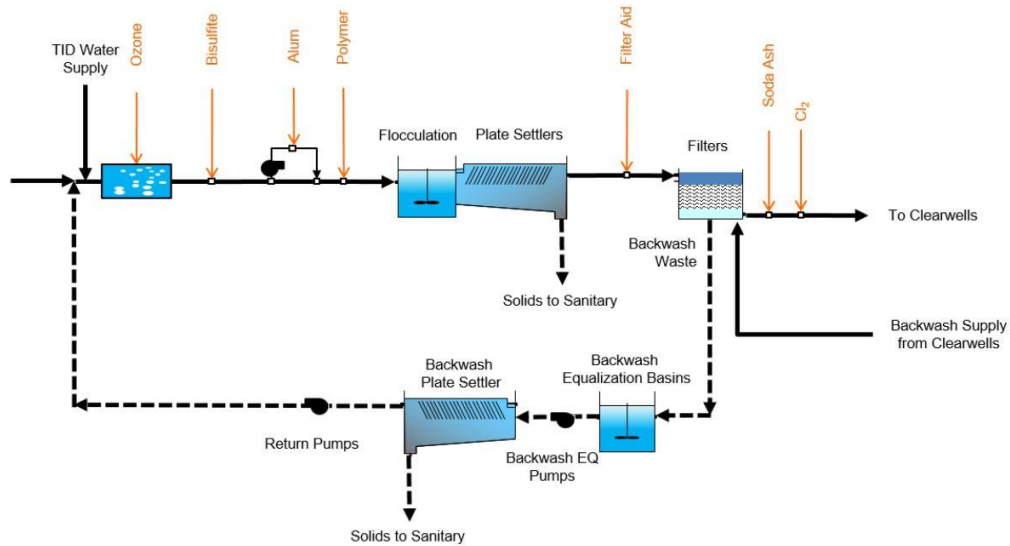
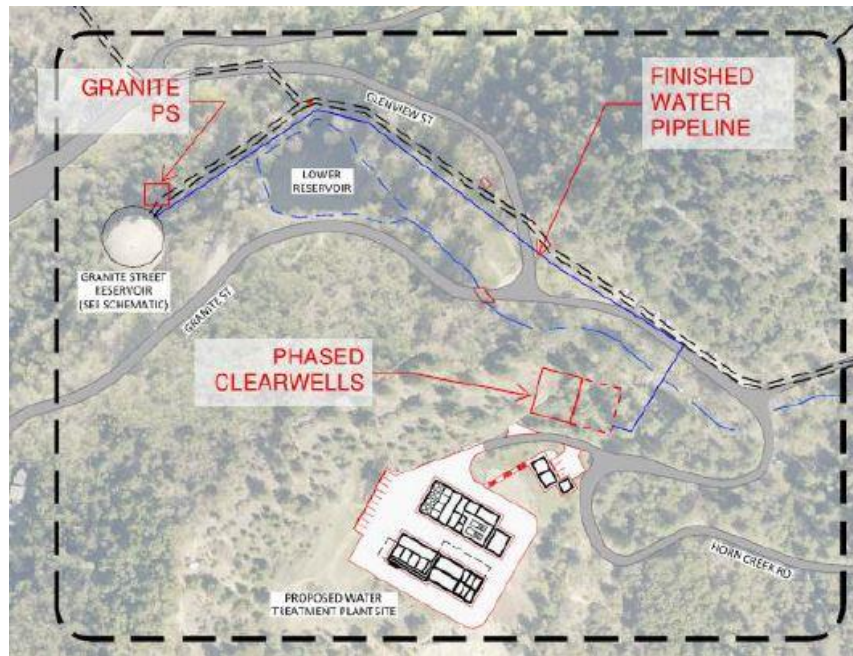


Figure 2:



The outcomes of the second workshop allowed HDR to move forward with generating a draft of the 30 percent design documents, update initial cost estimates, and develop the technology’s alternative technical memorandum and executive summary. This information was presented to the Ashland Water Advisory Ad hoc Committee (AWAC) at the April 23, 2019 meeting and posted on the City’s CIP storybook page.

The third workshop involved critical discussions with the current plant operators with respect to their needs to successfully operate a new water treatment plant. The focus was to inform HDR on primary facility needs for the operations building. This included discussions for office space, lab requirements, computer

workstations, conference and lunch room space, and general accessibility criteria for community and school tours.

HDR has compiled all information to date and drafted the BoDR and generated 30 percent piping and instrumentation documents along with an updated cost estimate. A fourth workshop was scheduled and held on June 11, 2019. This workshop focused on value engineering (VE). The purpose of the value engineering meeting was to discuss and develop cost saving measures for the project that would not affect the treatment process as the updated cost estimate showed a significant increase from \$32.5 to \$45.9 million. A majority of the cost increase was associated with the site work (excavation) in order to construct the operations, treatment, and clear well facilities on the site in distinct locations. All piping connections to the distribution system require crossing Ashland Creek and is accounted for in the overall cost. The cost increase also accounted for future storage requirements that were removed as they are programmed in the water master plan update.

The workshop included a step by step walkthrough of all critical design elements with the focus of reducing costs while not sacrificing treatment ability and capacity.

City staff were also fortunate to receive additional outside project review from Brad Taylor PE, Medford Water Commission (MWC) General Manager, Ben Klayman PE, PHD, MWC Director of Water Quality and Treatment and Ed Olsen PE, Varius, Inc.

HDR staff provided a comprehensive background presentation to AWAC at the June 23, 2019 meeting. This presentation reviewed all steps taken to date with respect to the engineering of a new treatment plant.

After completion of the VE workshop, HDR compiled all information and worked to refine the design documentation with the focus to reduce costs by numerous methods. Major outcomes of the VE meeting included reducing the overall site footprint and excavation requirements; potential inclusion of a high rate sedimentation system over plate settlers; move ozone from intermediate to pre-ozonation in the treatment process; reduce retaining wall size and length; and master plan other improvements not directly part of the treatment process. HDR supplied the City with an updated BoDR report and refined cost estimate in late July. The updated cost estimate prepared by Mortenson after accounting for VE changes is \$35.9 million. Staff and HDR continue to discuss cost saving measures.

Staff provided AWAC with another project update at the July 23, 2019 meeting. This included covering outcomes of the VE workshop and how the cost estimates have changed throughout the project.

Critical Design Elements of new WTP

Resilience - Backup power, current seismic design requirements

Robust - Allows for varying water quality and turbidity

Simple - Similar to existing process with enhanced treatment from ozone and sedimentation

Energy Efficient - Solar power generation onsite, focus on reduced system pumping

Expandable - Existing filtration system might be able to be re-rated at a higher flux to 10 MGD peak capacity thus requiring no additional infrastructure expansion

Next Steps

It is the intent of staff to bring award of contract for final engineering to the Council at the September 3, 2019 Business Meeting. This will allow HDR to move forward and develop final plans, specifications and estimates and the formal bidding documents to publicly solicit the construction phase of the project. It is anticipated to take eight to ten months to complete the final engineering documentation package along with navigating the permitting process. Once complete, the project will be bid and construction contract award

will take approximately four months. The total construction period is anticipated to last 24 months. The project is expected to be complete and operational in 2022.

FISCAL IMPACTS

The proposed project cost developed in the preliminary engineering phase at five percent design was \$32.5 million. Mortenson developed a 30 percent design cost estimate of \$45.9 million, which included rehabilitation to the Granite Street reservoir and a 200KW solar panel installation onsite. Through the value engineering phase, staff and HDR focused on ways to reduce the estimated cost back down without limiting the ability to meet project goals. After completing the VE workshop HDR adjusted drawings and worked directly with Mortenson to update the cost estimate and BoDR report. Mortenson generated a new project estimate of \$35.9 million which is inclusive of overall site design changes from the VE workshop. The \$35.9 million represents a nine percent increase from the five percent design estimate costs.

The City contracted with Hansford Financial Consulting to analyze the need of projected future water rates based on the adopted 20-year Capital Improvement Plan (CIP). In June the Council approved a four percent rate increase for the first year of the biennium that supports the WTP project and water CIP. In addition, the rate projections were further analyzed in conjunction with the Water Master Plan update (2020-2030) and remain consistent with Hansford’s previous projections.

DISCUSSION QUESTIONS

Does the Council have any questions or feedback regarding development to date of the new water treatment plant documents?

SUGGESTED NEXT STEPS

At the September 3, 2019 Business Meeting, staff will bring before Council an award of contract request for phase two final engineering.

REFERENCES

[Basis of Design Report](#)