Menti Questions and Responses
C-43 West Basin Storage Reservoir Water Quality Feasibility Study Public Meeting
July 16, 2020

Questions	Responses
Please type in any questions you have related to the technologies that were evaluated for the Study.	
What is Bold and Gold made from? What are its ingredients?	We are using the CTS mixture, which includes clay, tire crumbs and fine sand. All have sorption attributes that are good for nutrient removal and are made from local materials. The concept for this site is to use sands from the project area in this mix.
Why alum rather than another coagulant?	Coagulants are more frequently used in treatment and water quality projects than habitat restoration projects. The most common is alum which has been used in lake restoration projects. This ties into the question about why alum instead of another coagulant. Alum is more proven at these larger scales than other coagulants. There are other chemicals that go with the alum to help with buffering pH.
How difficult is it change out the Bold and Gold media?	This would be a rebuild of the media layer by physically removing the media bed. That would be 5 feet of media depth for this project. The media would be removed using mechanical means and replaced with media created onsite. Implementation at this scale has not been done but has been done on smaller scales.
When do you anticipate DEP will certify the operation of the reservoir?	DEP will certify the operation of the reservoir after the operational testing monitoring phase, which will be after construction is complete. This is part of all CERP projects. This would occur around 2024 and DEP will work with SFWMD to permit those operations through the CERP process.
Does alum change the physical, chemical, or biological conditions in the waterbody or downstream?	Alum has been permitted by DEP going back to the 1980s. It has shown very effective treatment and is easy to manage. The City of Tallahassee uses alum in several location and they have the oldest system since 1984. The city has managed the output and the pH to prevent problems with alum. There was one system that they had to scale back because it was removing too much nutrients. Alum is very effective and easy to monitor. Alum systems would get an Environmental Resource Permit (ERP) and also a National Pollutant Discharge Elimination System (NPDES) permit, which would have both a DEP and U.S. Environmental Protection Agency Region 4 oversight, which would require extensive monitoring.
How are coagulants being used in other restoration projects?	Coagulants are more frequently used in treatment and water quality projects than habitat restoration projects. The most common is alum which has been used in lake restoration projects. This ties into the question about why alum instead of another coagulant. Alum is more proven at these larger scales than other coagulants. There are other chemicals that go with the alum to help with buffering pH.
How will alum be monitored to ensure it does not become toxic? Have those costs been included in the cost/benefit?	Process control monitoring includes the testing and instrumentation needed to operate each technology successfully and efficiently. The equipment and costs for process control monitoring are built into the construction and O&M costs for all the technologies evaluated.
If Bold and Gold is mainly made of sand and clay, why not disperse clay on the reservoir. It would be cheaper than the Bold and Gold, has been proven to treat harmful algal blooms in Southeast Asia and the residuals are not harmful and consist of a very fine layer	The experimental application of clays have been investigated for the control of harmful algal blooms in the US, Florida, and internationally. Pilot study results show effective algal bloom reduction and phosphorus removal. Nitrogen removal results show a more variable response. For this study, our focus was on the use of innovative and alternative technologies currently accepted by the FDEP for water treatment, which does not include a clay application technology or commercial vendor. As clay application technology grows in case studies and acceptance, this approach could aid future management of water quality in the reservoir, if it becomes necessary.
Is Bold and Gold a proprietary product?	Bold and Gold is a proprietary product. UCF has eight U.S. patents and two trademarks for B&G and it is licensed to ECS Inc. for distribution and application.
Will any of the technologies evaluated adversely impact dissolved oxygen?	The technologies will not adversely impact dissolved oxygen. The technologies will reduce nutrient concentrations and the potential for algal blooms, which should help dissolved oxygen in the system.

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Does this study take into account an increase in nutrients coming into the C-43 as there is more nutrient used in South Florida. Would increase of nutrients coming in slow the removal and the target cfs?	The project cannot affect the flow going downstream to the estuary. We looked at a snapshot of water quality data from the last 10 years. We did not forecast any increases in nutrients. We did this for comparison purposes to compare the technologies as apples to apples. The sizing of these systems is based on flows and concentrations. If we see an increase, there may be a need for additional facilities and acreage for treatment. The benefit of alum is that it can treat more load and flows but there would be more residuals. There is the ability to scale up for flows and concentrations. It would not slow removal but may require a change in operations and additional features.
Great info on alum Ed. Thank you.	Thank you!
An excellent presentation and detailed responses to the questions! Great job Team!	Thank you!
Is the C-43 reservoir draft operating manual available online?	The draft manual should be in DEP's OCULUS system. If you cannot find it, you can email Ed Smith at DEP for a copy of the draft operations manual.
Please type in any questions you have related to the C-43 West Basin Storage Reservoir Project.	
Have the dam safety issues been resolved with respect to material used?	As part of the project design, it went through U.S. Army Corps of Engineers and independent peer review for safety issues related to construction of the dam.
Don't think I understand why the question we're trying to answer today was not incorporated into the original study?	This question has come up before. This reservoir was designed to regulate flows to the river and estuary and a water quality component was not included at the time it went through the Project Implementation Report (PIR) process.
Will the reservoir be operable if water exiting does not meet water quality standards?	The reservoir is pulling water in from the C-43, holding it in the reservoir, and transferring it out. The waters are not separate from Waters of the US so it falls under the water transfers rule so this does not apply.
Will there be an opportunity to clarify and provide more information on a technology?	On the project website, there is detailed information on the projects including reports and our Information Collection Summary Report. Additional information can be sent to the team for consideration in the next draft.
How will adaptive management be used in reservoir operations to mitigate water quality impacts?	One of the concepts is to use the reservoir during the dry and cooler seasons so we can count on some degree of better water quality during that season for discharge. We can also recirculate water within the system, which is more expensive, to minimize impacts from discharges.
Do you know if there is an estimated budget for this project?	The budget for the water quality treatment component has not been determined. The next phase of the project will evaluate costs in more detail.
Is the C-43 Reservoir draft operating manual available online?	The draft manual should be in DEP's OCULUS system. If you cannot find it, you can email Ed Smith at DEP for a copy of the draft operations manual.
What is the deadline for comments?	The website has an email address where we will continue to take comments or information up until the completion of the Study. We would appreciate any comments by mid/late August when we will be starting to work on finalizing the Study. On the Working Group website for the project there is a lot of information for review. In the Work Plan, the contact information for the Working Group and J-Tech is included so you can reach out directly but we encourage everyone to use the email address.
Was dissolved air flotation considered as a technology?	Dissolved air flotation was considered as one of the top ten technologies. However, it did not rank high enough to be considered in the recommended alternatives.
Isn't the team doing this study impressive?	Thank you!
Please type in any additional questions you may have about the Study.	

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Is there any chance ranking of alternatives will be revisit given input today?	We would revisit the alternatives that were selected if we thought there would be a major change in the cost-benefit analysis. We conducted a sensitivity analysis on the cost-benefit based on information received. If there are new data available that we have not seen before but it would have to be a fairly big change in the ranking to change results. There may be people who have concerns about how this ranking affects project in the future. Whatever is ranked #1 here is not necessarily the project that will be implemented. We will use the results from this study in the next phase with other information on land availability, timing, other priorities, how things work together, etc. We would then determine the final project. SFWMD has budgeted to further evaluate the top alternatives and are looking to have one recommendation in early 2021, which could be one or a combination of technologies. This alternative would go forward with design, permitting, and construction to be done concurrently with completion of the reservoir.
What is the process for identifying, designing, and funding the water quality treatment project?	The Feasibility Study is the first step in the process for the water quality treatment project. The Study is evaluating different technologies to determine the most applicable for the reservoir. The next phase of the project will evaluate the recommended alternatives to identify one project alternative that will go to design, permitting, and construction. Funding sources for the project will be determined in the next project phase.
Please clarify that the water transfer rule exempts discharges from WQBELs.?	The water in the reservoir is Waters of the US so it would qualify under the water transfer rule. Water is simply being held for use at a later date.
Isn't this team doing this study impressive?	Thank you!
Questions from Zoom Participants	
Where can I find studies on aluminum toxicity, or studies related to the HWTT, to the flora and fauna at the discharge site?	This has been a common and frequent topic as alum technology has been implemented over the last 30 years. Studies by Harvey Harper from projects in central Florida are cited in our report and are available on the SFWMD project website. The HWTT technology also has reports summarized from Watershed Technologies as they have implemented this technology for SFWMD over the last several years. Additional details are posted on the C-43 website and the link will be provided at the end of the presentation.
I remember in the first meeting an alternative was discussed where some type of absorption media was built in to the walls of the reservoir itself. Did I miss that today or was it dropped from consideration?	We have to dismiss any alternates that result in a reconfiguration of the authorized project for the reservoir. Therefore, this option had to be dropped from consideration.
If using a technology that provides reusable fertilizer, what would be the costs to produce the fertilizer and can the sales be used to offset bulk of costs?	The vendor that developed this approach does have a partner for the management of residuals that would make residuals into fertilizer. This would offset the costs depending on the availability to use the solids as fertilizer, and this information is summarized in the report. It does help to defray some of the costs although there are significant capital costs with this technology.
Bill Mitsch from Florida Gulf Coast University has described a process he calls "wetaculture." It involves working with farmers to create incentives for "soaking" fields (using portions of property) as wetlands. Is this similar to the hybrid you described?	The wetaculture concept is one that takes a land area and has it cycle over the years between some type of crop rotation and flooding fields to allow those lands to become wetlands. This approach uses internal recycling where nutrients are trapped in the sediments in the system by the wetlands so that crops can use the nutrients instead of applying additional fertilizer. This is not the same technology as the HWTT.
Most of these systems have a residual. The last one proposes turning it into fertilizer. What is done with the residual on the other systems?	This is the crux with using a chemical coagulant because it accumulates over time. Other facilities, like the NuRF in Lake County, have managed residuals for years. They have used it for soil amendments and soil addition in restoration projects. The material has also been proposed for use as a wetland subgrade for constructed wetlands since it has the ability to absorb phosphorus removal over time. Accumulated residuals will either be placed in a landfill or used as mentioned above.

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Why has the reservoir been exempted from meeting TMDL or BMAP requirements?	The purpose of the Study is to identify treatment for the reservoir and will not achieve reduction to meet the entire TMDL. The Study goal is to treat the water to ensure the quality is as good if not better than what is going into the reservoir to help improve water quality for the river and estuary downstream.
Do you have an acreage for the treatment marsh (STA) if that is the selected alternative?	An approximately 5,000-acre STA would be needed, and details on this will be discussed later in the presentation.
How come STAs received a zero for land requirements? Does zero means that it requires land?	Zero means it requires a high amount of land so it received the lowest score for land requirements.
Do you have an written update to the September 2019 report? A draft report before the expected December 2020 final?	The Information Collection Summary Report was finalized in early April and it is posted to the project website. The Draft Feasibility Study will be ready in about one month for public review before the Study is finalized.
The difference in score from the second and third place (tie) and fourth place technology is one point. Is there enough sensitivity in the scoring to differentiate in the score and ranking?	We did do a sensitivity analysis, which is part of the report, where we varied the highest ranked criteria. This analysis did not show a differentiation in the top four technologies. The combination of weights did not have an effect on where technologies were ranked.
Can you clarify how the 457 cfs was incorporated into the design criteria? Was it based on moving enough water out of the reservoir to meet the 457 cfs at S-79 through each of the treatment technology options?	This is the typical rate of flow we are expecting to see discharged from the reservoir. The working hypothesis is that what discharges has to be equal to or better than what is in the river, which drove our treatment goals. We needed to treat a substantial flow to meet design targets for treatment.
Did scalability include to have a technology that can sustain zero flows for several weeks?	This was addressed and considered in review of the ten technologies. There is case experience where the filtration media, wetlands, and sand filters can all be dry for periods of time so they can treat the natural variation of flows. Technologies that are more chemically or electrically driven can be turned off. Technologies had to sustain zero flows to have gotten this far in the evaluation.
Were ancillary water quality impacts included in the ranking (sulfate, aluminum, etc.)?	Yes and no. Ancillary water quality impacts and benefits were wrapped up in the habitat creation and value to wildlife attribute. If a particular technology had a negative impact then that would be reflected in those attributes. Other water quality parameters were not included in ranking as a standalone attribute.
Did the cost include the capital cost or only the O&M? The cost was set per pound of phosphorus or nitrogen removed? Or per gallons treated?	The final costs were the net present values that included the capital cost for the technology, infrastructure requirements to deliver water to that technology and deliver it back, and associated O&M costs for both conveyance and technology. The technologies were evaluated in terms of pounds of TN, TP, and TSS removed.
Is the cost determined based on the water quality conditions (initial concentrations) at the site?	The starting inflow concentrations that were used for TN, TP, and TSS were based on a statistical evaluation of water quality data in the C-43 and represent average inflow conditions for the reservoir.
Did the cost benefit analysis of alum treatment assume that the floc would be removed?	Yes, this is included in the O&M costs for both the alum treatment and HWTT. A cost estimate is included to pump the floc from settling basins to drying facilities. Therefore, costs for both extraction and processing and drying are included.
Did the cost include dealing with the residuals?	Yes, as part of the O&M.
"Equal to or better" than the water quality that's already in the river" seems like a low bar. Since the water in the reservoir is coming from the river, what factors have been identified which are expected to worsen water quality in the reservoir?	We are not certain what water quality changes will occur in the reservoir but there should be a retention of nutrients. Therefore, we are assuming a conservative case because water quality will likely be better. The design targets represent typical water quality in the river during the dry season when there would be a discharge from the reservoir. This is not a simple target to treat to so we set a somewhat challenging requirement for nutrient reductions.
How does the stagnant conditions of the reservoir affect algae in the reservoir vs. the river itself?	Retention in the reservoir and retention of nutrients could result in algal production. This is reflected in the TSS goals that we asked the technologies to achieve.