

City of Tampa Augmentation Project

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The Howard F. Curren Advanced Wastewater Treatment Plant (plant) at the City of Tampa (city) has a permitted capacity of 96 mil gal per day (mgd), making it the fourth largest treatment plant in the state of Florida. Current flows are approximately 65 mgd and a portion of this flow, approximately 10 mgd on an annual average basis, is delivered to the south Tampa area reclaimed system for the following uses: as residential and commercial irrigation, at Tampa International Airport for cooling tower use, at the MacKay Bay refuse-to-energy facility for various purposes, and on-

site at the plant. The remaining flow, averaging over 50 mgd, is discharged to Tampa Bay.

The city and the Tampa Bay area are growing and in need of additional water supplies. Dual distribution systems have been very successful in reducing potable water demands, but are expensive to construct and disruptive to install in the city's built-out service area. The seasonal variations in irrigation demands also make it difficult to achieve beneficial use of the available reclaimed water supply.

In June 2016 the city initiated the Tampa Augmentation Project (TAP). This project is

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considering two alternatives to initially deliver up to 20 mgd of reclaimed water for regional beneficial reuse by improving groundwater and surface water levels, which in turn will allow additional surface water withdrawals by the city or Tampa Bay Water (TBW). The TAP feasibility study is cofunded by the Southwest Florida Water Management District (district). This article will summarize the tasks that will go into determining the feasibility of the TAP alternatives.

Existing Regional Water Supply System

The city is a member government of TBW, which is a regional water supply authority; however, Tampa's primary source of potable water is from the Hillsborough River Reservoir. In addition to water provided by the reservoir, the city can receive additional raw water supplies

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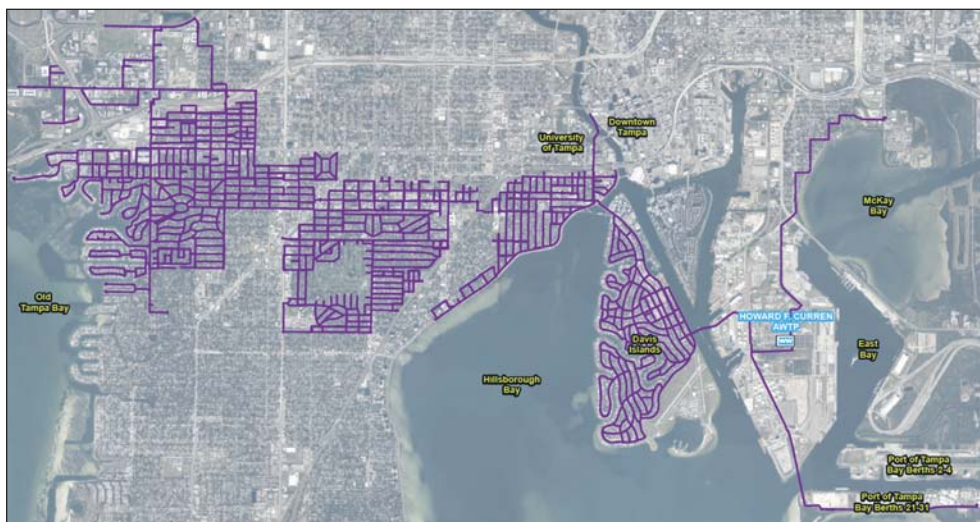


Figure 1. City of Tampa existing public access reuse system.



Figure 2. Regional potable water supply system considered in the Tampa Augmentation Project.



Figure 3. Alternative 1 will develop natural treatment systems on property owned by the Southwest Florida Water Management District.

TAP ALTERNATIVE 1

- 15+ mile pipeline
- Natural treatment systems on District Lands
- Augment Bypass Canal
- To Tampa Reservoir through the Harney Canal

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from the Tampa Bypass Canal through the Harney Canal if needed to meet potable water demands. The city may also purchase finished water from TBW through an interconnect between the potable water systems. Both raw water and potable water can also flow from the city's reservoir and finished water distribution systems back to TBW to provide additional water resources to the region, if this is needed. An important element of the TAP project will be to determine how this new water resource can be integrated into the existing regional water supply.

Alternative One

The first TAP alternative considers construction of a 15-mi-long transmission pipe from the plant to property owned by the district. Facilities at the district site may include constructed and natural wetlands, as well as engineered rapid infiltration systems. Reclaimed



Figure 4. Clay encountered on Southwest Florida Water Management District property.

water delivered to the site will travel both above and below the land surface to the Tampa Bypass Canal, which is part of the regional surface water supply system. Ultimately, any additional flows to the canal can be diverted to the city's Hillsborough River Reservoir via the Harney Canal, thereby increasing raw water availability to the city.

Status of Alternative One Investigations

The TAP investigations have been underway for approximately six months. Field investigations were initiated soon after notice to proceed, and preliminary hydrogeologic information and the results of environmental assessments are becoming available on the Alternative 1 site. A total of 19 borings from land surface to the top of the Floridan aquifer have found a consistent confining layer throughout the site. As shown in Figure 4, this clay layer presents a challenge with regard to constructing rapid infiltration basins as a means of providing additional treatment through soil aquifer treatment (SAT). Ecological assessments of the wetlands on the site have also determined that they are unlikely to be considered hydrologically altered by the Florida Department of Environmental Protection.

Such a determination is important as it establishes the maximum allowable reclaimed water loading to the wetlands. Loading rates to wetland systems, which are found to be in their natural state and not in need of rehydration, can only receive approximately one third of what would be allowed for wetlands in need of rehydration. The TAP team continues to assemble the results of the field investigations, which will feed into a groundwater model. A final report assessing the feasibility of using the district's property to augment regional surface water sup-

plies is scheduled to be completed in October 2017.

Alternative Two

The TAP Alternative 2 will also add to the regional water supplies, but use a different means to reintroduce reclaimed water into the Hillsborough River Reservoir or to the raw water intake system of the David L. Tippin Water Treatment Facility (facility). The second alternative will use aquifer recharge/recovery wells. In this alternative, reclaimed water will be injected into the Avon Park formation, allowing for permitted withdrawals from the overlying Suwanee aquifer, increasing potable water supplies for the region. Notable differences between Alternative 1 and Alternative 2 include the fact that the transmission piping to the Alternative 2 system is approximately half of what is needed for Alternative 1. Of equal importance, recharge of the Avon Park aquifer can continue independently of conditions at the surface. This will not be the case for Alternative 1, where the delivery of reclaimed water would be suspended in periods of high rain fall. In addition, Alternative 2 will provide a transmission pipeline from the plant essentially to the facility, setting the city up for direct potable reuse in the future.

Status of Alternative Two Investigations

An important element of the Alternative 2 field investigations will be assessing the aquifers available for recharge and recovery within the corridor shown in Figure 5. In order to accomplish this, a series of three cores will be taken to depths of approximately 900 ft. This will include collecting continuous cores from approximately 200 ft through completion of the core, and pump tests every 50 ft to evaluate aquifer characteristics. As with Alternative 1, the informa-

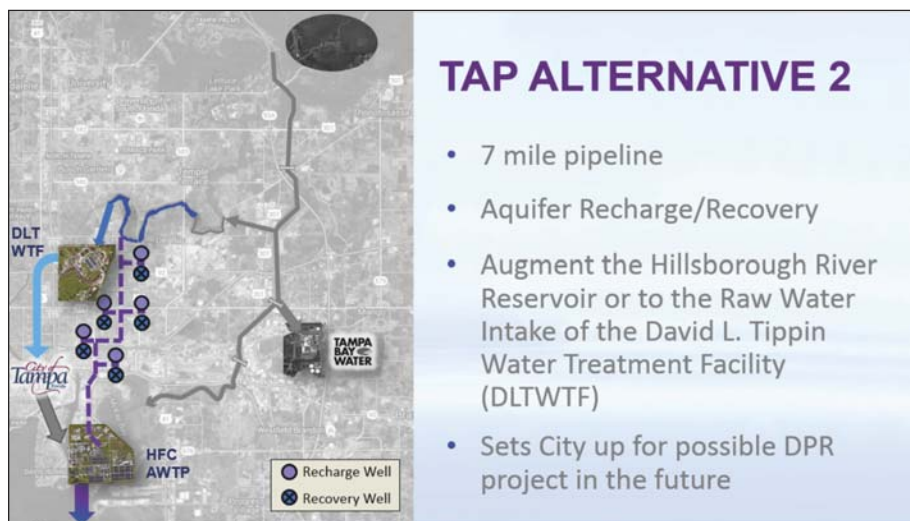


Figure 5. Alternative 2 will consider development of an aquifer recharge/recovery system.



Figure 6. The first of three cores associated with TAP Alternative 2 is almost complete.

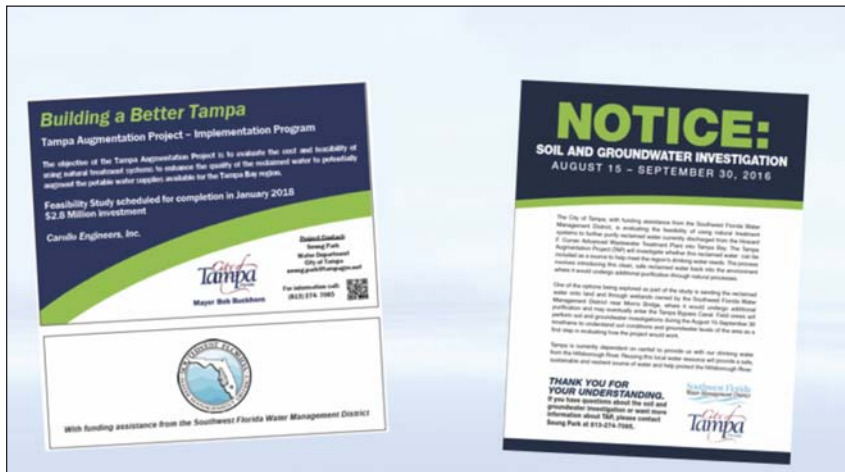


Figure 7. Example of the Tampa Augmentation Project public information program.



Figure 8. Notifications posted at a billboard on district property prior to starting field investigations.

tion collected from these cores will be used to develop a groundwater model to help evaluate how well the recharge/recovery system will serve to provide additional water supplies to the city.

The photograph in Figure 6 shows the work on the first of three cores to be taken as part of the TAP project. In addition to the analysis discussed previously, water quality samples were taken from the proposed recharge and recovery zones and a complete suite of primary and secondary water quality standards is being run on the samples; however, the results of this analysis have not come back from the laboratory. The project team is also using a handheld probe to take continuous measurements of pH, oxidation-reduction potential, dissolved oxygen, conductivity/salinity, and temperature throughout the depth of the cores.

Other Tampa Augmentation Project Investigations

Concurrent with the field investigations, the project team will investigate the improvements required at the plant to support the TAP alternatives, develop a transmission pipe route analysis for both alternatives, inventory the institutional and regulatory elements of the project, and initiate public outreach efforts. The institutional and regulatory evaluations will inventory the local, state, and national entities that may impact TAP. The public outreach efforts raise interesting questions in that no project has been selected and so there are no details to provide to the public; however, planning for interacting with the public has begun, and a consistent, accurate message is needed in the event questions arise regarding how the city is planning to meet future potable water demands.

In the near term, one of the most likely interactions with the public and TAP comes with

the field crews working on the district property for Alternative 1 and the cores being done for Alternative 2. Interaction with the public is particularly likely for Alternative 1 as the district property currently serves as a park and is being used for mountain biking and hiking. To be proactive in communicating with any persons approaching the field crew and asking about these activities, the TAP team developed a notice that was posted on a billboard at the entrance to the park (Figures 7 and 8) and developed a quick-facts card, which the field crews carry in the event they are asked questions about the project. With the fieldwork essentially complete on the district property, interaction with the public has been minimal, but the proactive approach to addressing any questions that might come up was the preferred strategy.

Summary and Look Ahead

The TAP project was authorized in June 2016 and is scheduled to be completed in January 2018 (Figure 9). The project team is proceeding with an investigation of both TAP alternatives. With the completion of fieldwork and subsequent groundwater modeling, the critical metric of how much new water each option will provide to the region will be developed for the natural treatment systems proposed on district property (Alternative 1) and the aquifer recharge/recovery strategy (Alternative 2). Combining the "yield" of each alternative with its associated costs will result in a calculation of dollars per gallon of new water provided. These results will then be compared to the costs of other alternative water supplies now being considered in the Tampa Bay area. ◊

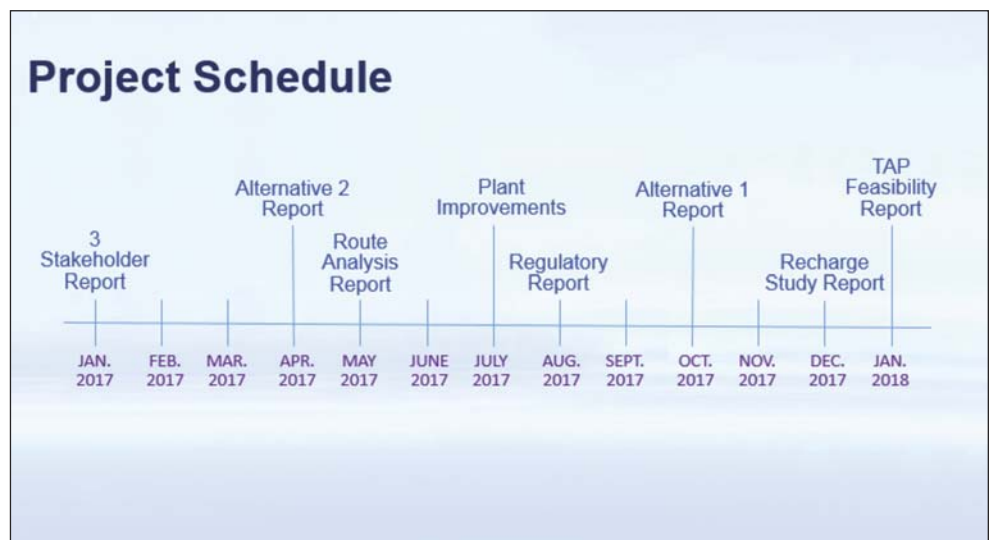


Figure 9. Tampa Augmentation Project schedule.