

**To the Mayor and Members of the City Council****October 24, 2023**

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SUBJECT: TRINITY RIVER WATERWHEEL INITIATIVE

The purpose of this Informal Report is to provide an update on the Trinity River Waterwheel Initiative, a collaborative and innovative partnership project among the City of Fort Worth, Tarrant Regional Water District (TRWD), Streams & Valleys, Inc. and private funders.

Waterwheel Project Overview

The City of Fort Worth is home to over 100 miles of trails along the Trinity River and its tributaries. The Trinity River Waterwheel Initiative project directly impacts the cleanliness of the waterway by removing floatables from the Trinity River using renewable energy through hydropower and solar power, minimizing energy costs and related maintenance. By locating a waterwheel-powered trash interceptor (waterwheel) on the Trinity River along the Trinity Trails System, it is anticipated that – in addition to helping to keep the river clean – the waterwheel will also bring heightened awareness of community stewardship. It will provide an educational opportunity and visual reminder of the community's efforts to combat litter within its watersheds, and the importance of litter control and litter clean up efforts.

Waterwheel Location and Reducing Litter

The waterwheel will be installed in the Trinity River-Clearfork along the south bank and is engineered to be effective as water levels of the river rise and fall. It can be expected to demonstrate the greatest benefits during and after medium and high-flow rainfall events that frequently flush litter and debris into the river from the storm drainage system. The waterwheel collects and removes trash and debris from the river's surface.

The waterwheel can:

- capture up to 50,000 pounds of floatable litter and debris daily known as 'floatables'
- effectively contain and collect floatables at a single point to prevent it from continuing downstream
- use reusable refuse containers (i.e., dumpsters instead of disposable nets)
- improve the aesthetics and the usability of waterways
- improve aquatic ecosystems for fish and wildlife
- provide an opportunity to educate the community about environmental stewardship

To highlight the need for a waterwheel on the Trinity River, staff collected approximately 28,500 pounds of litter and debris after one heavy rainfall event on August 21, 2022 in a four-day period. This was collected mostly by hand from the banks of the Trinity River. That same year, TRWD's two Trash Bash volunteer litter clean-up events collected approximately 13,500 pounds of litter and debris from along the banks of the Trinity River. The cleanup events are indicative of the amount of floatables that flowed downstream. The planned location of the waterwheel is shown in Figure 1, below.

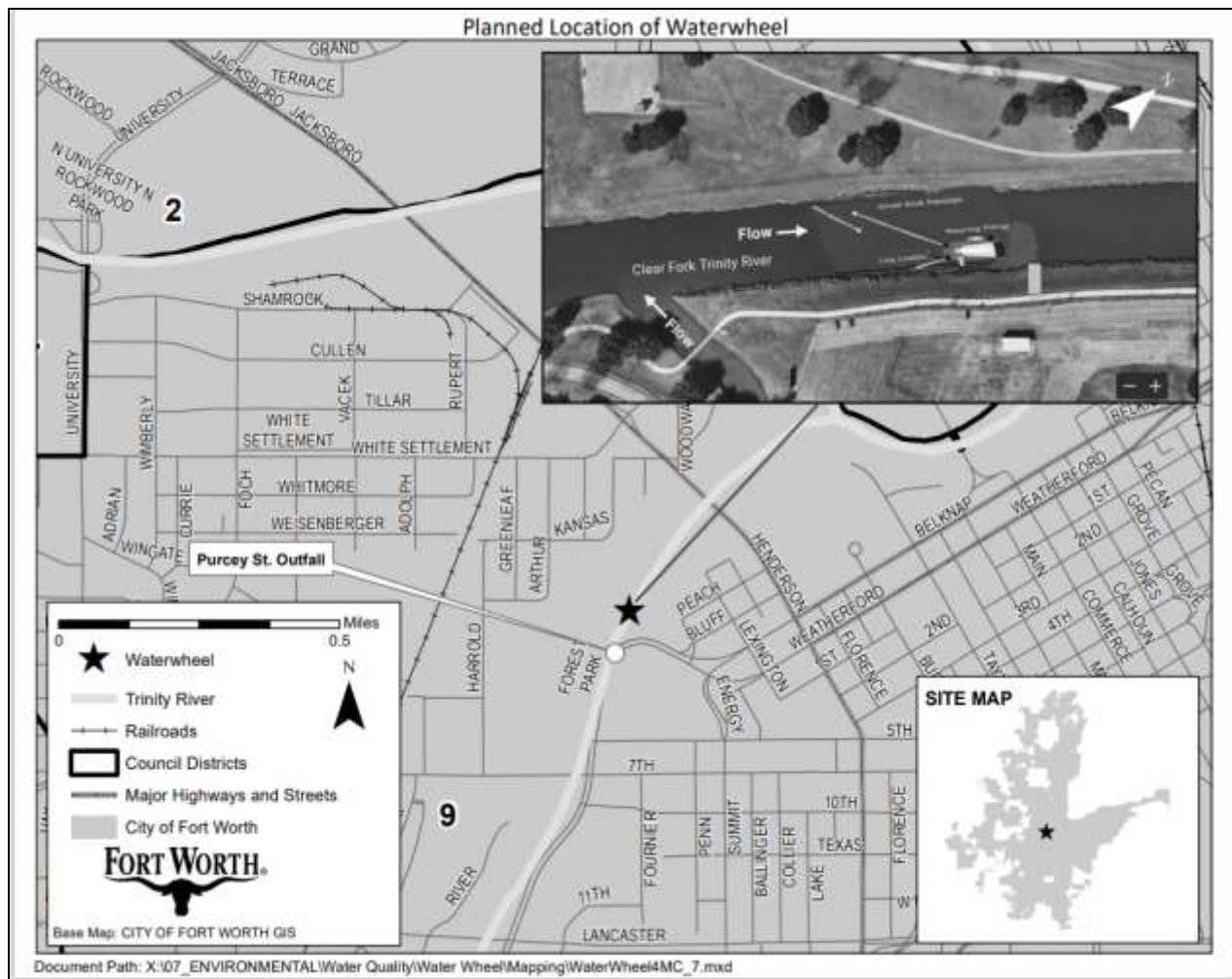
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Figure 1: Planned Location of Waterwheel

**Waterwheel Project Details**

Fort Worth will be home to the sixth waterwheel in the world and the first waterwheel in Texas with an inland river application. Proof of concept has been demonstrated in Baltimore Harbor (four (4) waterwheels) and most recently in Panama City, Panama.

The installation of the waterwheel is expected to be completed in Summer 2024. Once installed, the expected lifespan of a waterwheel is estimated to offer over 20 years of service with normal preventative maintenance. After installation, operations and maintenance costs to include debris removal/disposal will be shared between the City and TRWD. TRWD will be conducting the routine removal of collected debris to ensure continual operation of the waterwheel.

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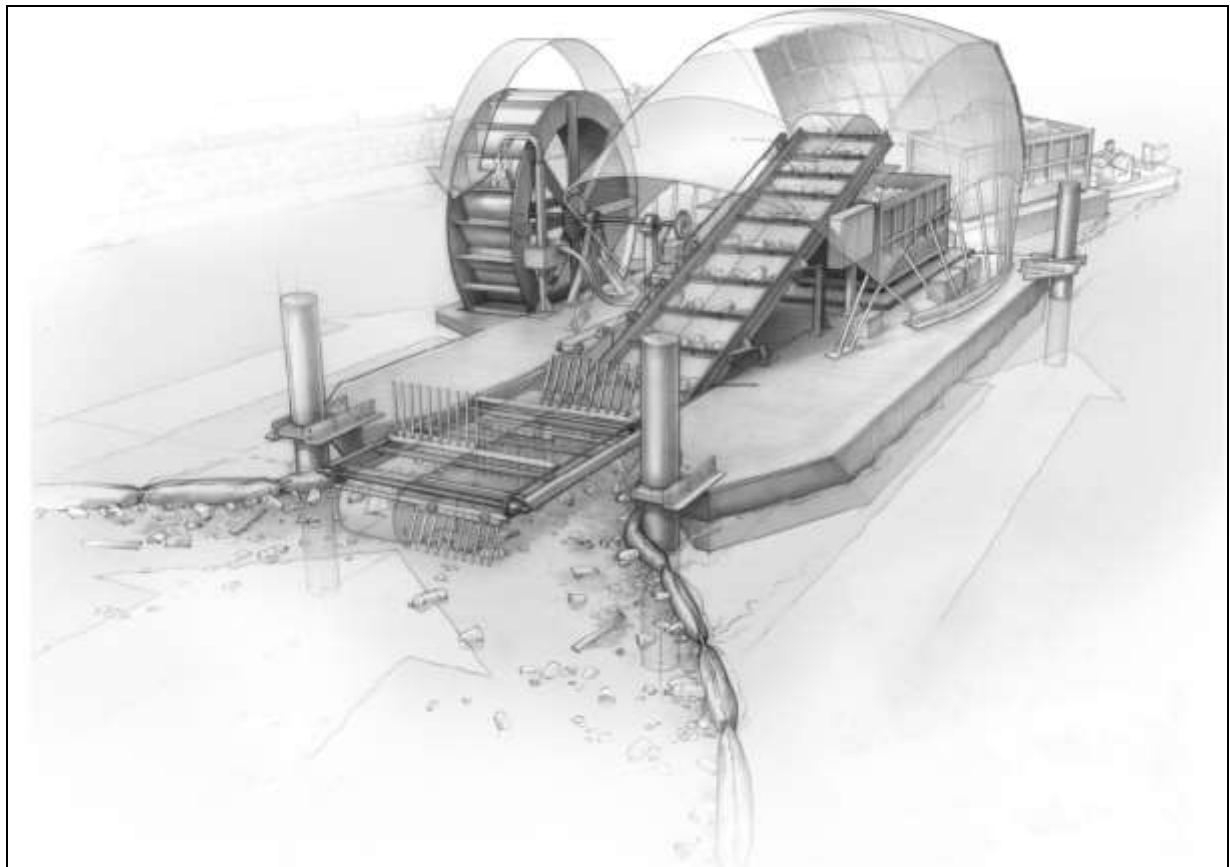
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An M&C to authorize the Memorandum of Understanding (MOU) between City of Fort Worth and TRWD will be on the November 14th council agenda for approval. The TRWD Board of Directors approved execution of this MOU on September 19, 2023.

Upon construction, the waterwheel will be located specifically downstream of the Purcey St. stormwater outfall, located south of the Henderson St. Bridge over the Trinity River. This location was strategically located because much of the storm drain network from downtown Fort Worth drains to this point. The dimensions of the waterwheel are approximately 62 feet long, 28 feet wide and 22 feet tall. The collection equipment sits on a floating deck; the waterwheel mechanism is attached onto the interior (river side) of the deck which helps to power the conveyor belt that draws floatables into the reusable dumpster. Solar energy is used during low-flow conditions. The waterwheel is expected to be a key attraction to the river that will not inhibit river recreation and enjoyment. Figures 2, 3 and 4, below, offer architectural rendering and engineering drawings.

Figure 2: Architectural Rendering of Waterwheel



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Figure 3: Profile Drawing of Waterwheel

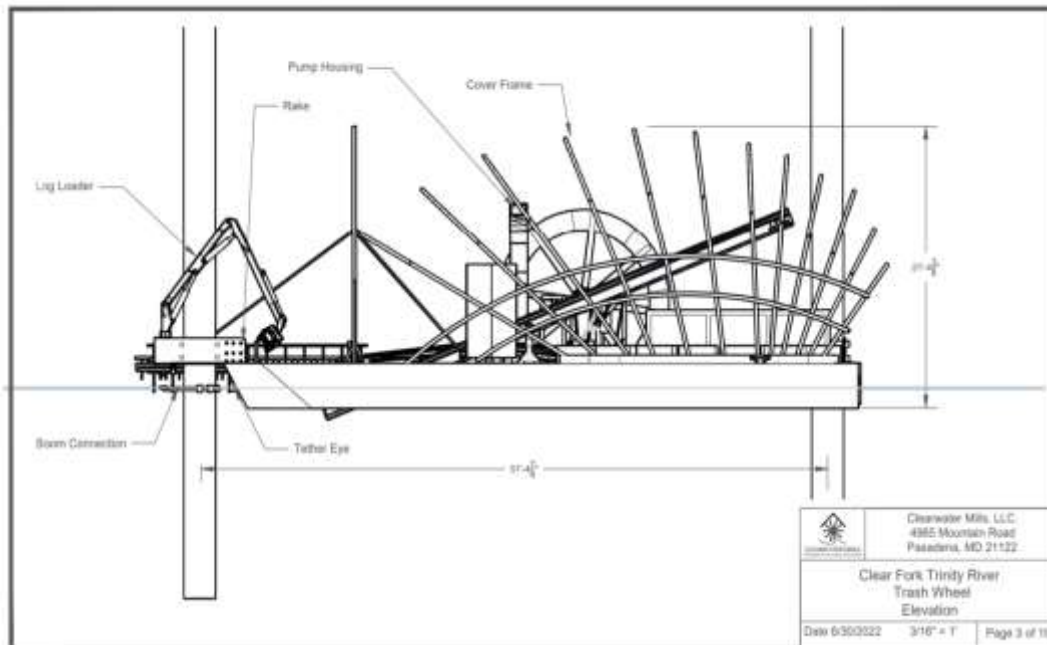
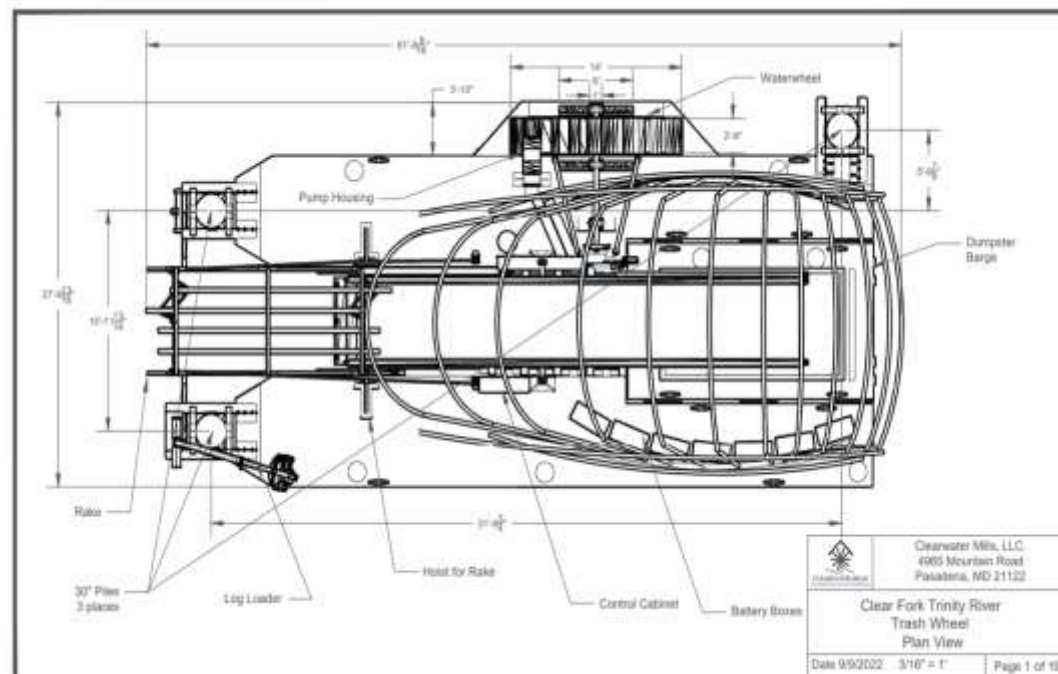


Figure 4: Aerial Drawing of Waterwheel





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Army Corps of Engineers

The U.S. Army Corps of Engineers (USACE) has been involved in the review and approval of the waterwheel project; this is required to install infrastructure in the Trinity River. The TRWD has received the necessary approvals and permitting from the USACE that is required to move this project forward.

Waterwheel Project Funding

In FY2021, City Council authorized M&C21-0985 to begin accepting donations for the installation of a waterwheel up to \$2.5 million. A special projects capital project fund was created for donations received. A webpage for the Trinity River Waterwheel Initiative was also created to accept donations for this project through the City of Fort Worth website. At this time, \$660,000 in private donations has been secured.

The adopted FY24 Budget for the Environmental Protection Fund included \$350,000 to cover one half of estimated capital costs, and the other half is in the FY24 budget for the TRWD. In addition to the capital funds, the City and TRWD have agreed to share the estimated annual maintenance expenses with a 50/50 split. Maintenance costs are anticipated to be \$50,000 and no more than \$75,000, annually.

The City and its partners will continue to engage in private fundraising efforts. A summary of the initial funding to date is listed below. To learn more about the waterwheel project, project donors to date, and to contribute, please visit: www.fortworthtexas.gov/waterwheel.

Funding Source	Value
Private Donors	\$660,000 received or committed
Tarrant Regional Water District Funding	\$350,000
Environmental Protection Fund - Capital Funds	\$350,000

The City of Fort Worth, TRWD, and Streams & Valleys offer a special thanks to our current donors included in the table, below. Additional donors will be announced as donations are received.

Christine A Miller & Gary H Glaser Charitable Fund	Mrs. Renfro's
Freese & Nichols	Nicholas Martin Jr. Family Foundation
Greater Fort Worth Assoc. of Realtors	Terracon
GWR Foundation Fund	TTI, Inc.
Leggett & Platt	Wilkes Family Charitable Fund
META	Other Individual Donors

For any questions on this report, please contact Cody Whittenburg, Interim Environmental Services Director, at 817-392-5455.

David Cooke
City Manager