

Staff Report

**DALEY PARK SPLASH PAD UPDATE**

December 19, 2023

**BACKGROUND:**

City Council has approved the installation of a splash pad in Daley Park. Prior to this approval staff presented three water management system options for the splash pad which included the following:

**Recirculation System**

Recirculation is a closed-circuit system that recycles and disinfects the water to and from the play area. This is the system used at Brookside Wading Pool and the Furman Aquatic Center.

**Flow-Through System**

Flow-through systems are easy to operate and low maintenance. These systems use potable water that goes through the play area. Rather than being recirculated, the water used in this facility flows directly to the municipal wastewater system.

**Repurpose System**

Repurposing systems are sustainable solutions that are designed to reuse the effluent water for surface or sub-surface irrigation. These systems are simple to operate and require minimal maintenance. After use on a splash pad, effluent water is transferred to an effluent water holding tank, then sent through the filtration & disinfection system, treated water is then transferred to a second holding tank. The irrigation pumping station then draws water from the second tank for surface or sub-surface irrigation, the water nourishes vegetation, and returns to nature.

Attachment A details each of these three systems.

After reviewing and discussing the three options, Council directed staff to proceed with design utilizing a recirculation system. As a design was being developed, the Iowa Department of Public Health informed the design team that showers and additional bathroom fixtures are needed because of the recirculation system. To accommodate these additions, a new restroom building has been added to the design. This has resulted in a significant increase in the estimated project cost which is now \$1,342,142.

**WATER CONSUMPTION COMPARISON:**

The main difference between the systems described above is that in a flow-through system, the water goes directly to the sanitary sewer system after it exits the spray features. The recirculation system reuses the water, however, there is a loss of water through evaporation, backwashing, and periodic water replacement. **The two tables below show how much water is used during a 92-day season with the splash pad in operation 10 hours per day.**

**Flow-Through System Water Usage**

Maximum Flow Rate (gpm)	245
Average Sequence Flow Rate (gpm)	208
Maximum Flow Per Hour (Gallons)	12,495
Hour Per Season	910
Consumption Per Season (Gallons)	11,370,450
Average Daily Consumption (gpd)	123,592
Average Daily Consumption (cf)	16,523
Average Annual Consumption (cfps)	1,520,114
Average Annual Consumption (ccf)	15,201

**Recirculation Water Usage**

Maximum Flow Rate (gpm)	245
Average Sequence Flow Rate (gpm)	208
Maximum Flow Per Hour (Gallons)	12,495
Hours Per Season	910
Spray Volume Per Season (gps)	11,370,450
Water to Fill Tank (Gallons)	3,000
Dump & Fill Every 3 Days (gps)	92,000
Water Used Per Backwash (Gallons)	300
Backwash 1 Time Per Day (Gallons)	300
Backwash Water Consumption Per Season (gps)	27,600
Evaporation & Overspray Loss @ 4% (gps)	454,818
Consumption Per Season (Gallons)	577,418
Average Daily Consumption (gpd)	6,276
Average Daily Consumption (cf)	839
Average Annual Consumption (cfps)	77,195
Average Annual Consumption (ccf)	772

As you can see, a flow-through system uses 11,370,450 gallons per season compared to 577,418 gallons for a recirculation system. Since Council was concerned with water conservation, it chose to select the recirculation system.

**CAPITAL AND OPERATIONAL COSTS:**

A comparison of the capital and operational costs between the two systems is shown below.

**SPLASH PAD LIFE CYCLE COSTS 10 AND 15 YEARS**

**ESTIMATED SPLASHPAD CONSTRUCTION COSTS**

	<b>Flow-Through</b>	<b>Recirculation</b>
	<b>5,000 SQ FT</b>	<b>5,000 SQ FT</b>
Equipment Costs & Labor	\$223,380	\$ 485,000
Site Demolition, Earthwork, & Restoration	\$ 24,500	\$ 24,500
Water Service	\$ 19,400	\$ 27,400
Sanitary Sewer & Subdrain	\$ 21,500	\$ 21,500
Electrical Service	\$ 15,000	\$ 15,000
Pavements	\$ 97,394	\$ 97,394
Costs to Comply with IDPH Requirements	\$ 0	\$ 425,000
<b>Subtotal (2023 Dollars)</b>	<b>\$401,174</b>	<b>\$1,095,794</b>
Escalator for 2024 (5%)	\$ 20,059	\$ 54,790
<b>Subtotal (2024 Dollars)</b>	<b>\$421,233</b>	<b>\$1,150,584</b>
Contingency (10%)	\$ 42,123	\$ 115,058
Design & Engineering	\$ 26,500	\$ 76,500
<b>Total Estimated Project Costs</b>	<b>\$489,856</b>	<b>\$1,342,142</b>

**ESTIMATED ANNUAL MAINTENANCE AND OPERATING COSTS**

Water	\$ 61,104	\$ 4,397
Sewer	\$ 47,312	\$ 2,437
Maintenance	\$ 1,380	\$12,000
Restroom Cleaning	\$	\$ 5,000
Parts & Supplies	\$ 100	\$ 2,500
Chemicals	\$	\$ 450
Electric	\$ 350	\$ 5,571
<b>Total Annual Operating Costs</b>	<b>\$110,246</b>	<b>\$32,355</b>

## ESTIMATED LIFE CYCLE COSTS - 10 & 15 YEARS

Estimated 10 Year Water Costs	\$780,883	\$ 52,516
Estimated 10 Year Sewer Costs	\$581,790	\$29,968
Estimated 10 Year Maintenance, Etc. Costs	\$21,971	\$306,408
Estimated Total Project Costs	\$ 489,856	\$1,342,142
<b>TOTAL 10 YEAR COST</b>	<b>\$1,874,450</b>	<b>\$1,731,034</b>
Estimated 15 Year Water Costs	\$1,315,944	\$ 88,499
Estimated 15 Year Sewer Costs	\$ 978,835	\$ 50,419
Estimated 15 Year Maintenance, Etc. Costs	\$ 36,643	\$ 511,022
Estimated Total Project Cost	\$ 489,856	\$1,342,142
<b>TOTAL 15 YEAR COST</b>	<b>\$2,821,278</b>	<b>\$1,992,082</b>

### **FUNDING:**

The consultant's current estimate (in 2024 dollars) for a recirculation system is \$1,342,142. Currently, there is \$786,106 in the CIP budget for this project. Staff supports adding \$556,036 in the FY 2024/25 CIP to cover the project shortfall.

Current CIP	\$ 786,106
Proposed 24/25 CIP	\$ 556,036
Total	\$1,342,142

### **OPTIONS:**

#### **Option 1**

Direct staff to proceed with the Daley Park Splash Pad Project with a recirculation water management system.

#### **Option 2**

Direct staff to proceed with the Daley Park Splash Pad Project with a flow-through water management system.

#### **Option 3**

Direct staff to not proceed with the Daley Park Splash Pad Project.

### **STAFF COMMENTS:**

The question before Council is whether it wants staff to proceed with a recirculation system and allocate additional funding toward this capital project or direct staff to change design to a flow-through system.

A flow-through system is inviting as the capital costs are approximately \$850,000 less than that of a recirculation system. In speaking with colleagues from across the state, nearly all of the new installs

around the state are flow-through systems. While many liked the appeal of the recirculation system, they ultimately did not have a viable plan to capitalize on the water savings that would outweigh the additional capital expense to install the system. Flow-through systems were also preferred over recirculation systems due to the staffing and state code requirements that added staff time and expense to operate the system. A number of these cities also are not billed for water usage, making the feasibility of a flow-through system even greater.

**Council has previously directed staff to design the Daley Splash Pad with a recirculation system. The reason for its decision, Council noted the recirculation system is better environmentally as it will use approximately 5% of the water used in a flow-through system.**

**Although a recirculation system involves almost twelve times the labor for maintenance tasks than a flow-through system, the overall annual operating expense is much lower. There will be no fee for using this splash pad, so incorporating the additional operational expense for a recirculation system into the budget will be more feasible than trying to include operational expense for a flow-through. Therefore, staff would recommend Option 1 continue to be pursued.**

[Attachment A - Daley Park Splash Pad.docx](#)