

## City of Wichita Internal Water Conservation Plan

In response to the ongoing drought and declining water levels in Cheney Reservoir, City of Wichita staff are directed to:

### **Reduce water usage on City-owned grass covered land.**

Staff have identified two cost-effective measures for dramatically reducing the amount of water used for irrigation purposes on City-owned land. Due to their unique watering needs, these measures do not apply to athletic fields and golf courses; measures for conserving water on these specialized surfaces are addressed elsewhere in the plan. The first is to reduce the level of watering in order to place grass in a dormant state. Dormant grass uses substantially less water but reduces the aesthetics of City-owned land. Dormant grass also may not be as effective at cleaning the air, which may reduce overall air quality. The magnitude of this air quality impact should it occur is unknown. To generate estimated savings for using this approach, several assumptions have been made in order to apply landscape science to the City's specific situation. Compared to current and past watering levels, it is assumed that reducing the watering of fescue 20% and the watering of bermuda 50% will put these grasses in a dormant state. Applying these assumptions to the number of irrigated acres for each of these types of grasses yields an annual savings of 38,383,555 gallons and \$140,100. Through 2016, the City would realize a savings of 134,342,443 gallons and \$490,350. Staff believe that these assumptions are fairly conservative, meaning the estimated annual gallon savings is likely lower than what is possible.

The second measure would be to mow grass at a higher level, improving root shade and reducing evaporation. Not only will this result in reduced water usage, but potential savings through reducing the number of mowings as well. While grass that grows taller will also grow a deeper root system thereby making it more drought tolerant, aesthetics may suffer as a result. Research indicates this technique will reduce water usage, but no hard data has been found. Thus, an estimated gallon savings cannot be determined.

In addition to the measures ready for immediate implementation, staff will continue working on a proposal for converting fescue lawn installations to bermuda and bring it to the City Council for approval. The proposal will be complete by the end of August 2013.

### **Reduce the water usage of City fountains.**

The City of Wichita operates three different classes of fountains – decorative, interactive, and the fountain at Waterwalk. Because of the differences in how these fountains function and how they are used, different conservation measures have been identified for each.

Decorative fountains will remain on, but the operating season will shorten. Decorative fountains will now be turned on in May and shut off in October. Decorative fountains and their locations are as follows:

A. Price Woodard	A. P. Woodard Park
Bank Fountain	Heritage Park, South End of Park
Ben F. McLean	McLean, North of Douglas
Botanica	Button & Terrace Court
Business Man	Douglas & Main, NE Corner
Finlay Ross	Finlay Ross Park
Helen Galloway	Century II
Lady Fountain	Heritage Park, North end of Park

Learning Fountain	Douglas, North Side
Pedal Car	Douglas, North Side
Reflection Square	Reflection Square Park
Waterwall	Hyatt

Interactive fountains are often used by citizens as splash pads, serving a purpose beyond providing aesthetic value. Motion sensors will be installed at each interactive fountain for approximately \$1,000 each, while hours of operation will be reduced 10%. While this approach will save water, there are too many variables to generate an estimated savings. Interactive fountains and their locations are as follows:

Celebration Plaza	Riverside Park Central Celebration Plaza
Fairmount Fountain	Fairmount Park
Lincoln Water Play	Lincoln Park
Old Town Fountain	Old Town Square
Osage Fountain	Osage Park

The fountain at Waterwalk is unique among City fountains in that it requires water to continuously circulate through it in order to prevent damage and minimize required maintenance. Whereas all other fountains are completely shut off during the winter months, the fountain at Waterwalk continues to run in a relatively low-flow “maintenance” mode. A heavily modified show schedule has been created for the fountain that eliminates ambient shows, reduces active shows from three 20 minute shows a day to two 10 minute shows a day, and trims the show season. The current show season runs seven days a week May through December, whereas the new show season calls for shows running Friday through Sunday May 11th through the end of June and from September 1st through the end of October. Shows will run Friday and Saturday only from July 1st through the end of August. The modified schedule will save 2,528,000 gallons and \$9,225 annually. Through 2016 the new schedule will save 10,112,000 gallons and \$36,925. Eliminating the shows completely would only save an additional 16,000 gallons and \$58 each year.

In addition to modifying the existing show schedule, staff will evaluate the feasibility of installing an underground water storage tank at the Waterwalk fountain. Periodically the fountain must be drained for maintenance. Currently, this water drains to the sewer. As an alternative, the water could drain to a holding tank and be pumped back into the fountain once maintenance is complete. Staff will perform a cost/benefit analysis of this approach and bring a project to the City Council for approval as necessary.

**Create a capital improvement project that would reduce water usage at the Stryker Soccer Complex.**

Water usage at the Stryker Soccer Complex could be significantly reduced by converting the existing fescue grass to bermuda and reconfiguring the irrigation layout for 11 of the 12 fields (staff would work to secure a donation to convert the main stadium field to artificial turf, but would convert it to Bermuda if no donor is identified). Replacing the grass for the 11 fields would also reduce the required number of mowings (bermuda has a shorter growing season than fescue) while shortening the amount of time needed for sprinkler cycles, yielding more playing time. Bermuda sod could be planted in June 2014. Establishing new grass requires more water during the initial 10 weeks (1.4 million gallons more than would be used to maintain the fescue), but after 10 weeks, water usage would decrease approximately 25% from what would be used on fescue. Although establishing the new grass will require more water initially, because of Bermuda’s shorter watering season and significantly lower water requirements after establishment, replacing the grass would realize a savings of 2.5 million gallons and \$9,125 in 2014. After the initial establishment season, the grass replacement would realize an annual

savings of 10 million gallons and almost \$45,500. Included in that annual figure is \$8,500 in soft dollar savings resulting from the shorter mowing season. Through 2016, the grass replacement would save 22.5 million gallons and \$100,125. Based on projected savings and an upfront cost of \$232,000, the project would pay for itself in just under six years. Staff will work to validate these numbers, create a detailed implementation plan that includes impacts on field utilization, and bring the project before the City Council for approval by the end of August 2013.

**Utilize a new protocol for handling water taste and odor complaints.**

Staff in Water – Production and Pumping have developed a new protocol for handling water taste and odor complaints. Laboratory and troubleshooting staff will coordinate their efforts to look for all reasons other than flushing the water lines that may be contributing to the complaint. Line flushing will be the final action taken as a last resort if nothing else resolves the matter. This new protocol is estimated to save 720,000 gallons and \$2,600 annually without impacting service levels or lengthening the time for complaint resolution. Through 2016, the new protocol will save 2,520,000 gallons and over \$9,100.

**Utilize gray water from the Herman Hill Water Center to water trees.**

After completing a site visit to the Water Center and with additional testing it has been determined that sufficient water pressure is available to fill water tanks in a reasonable amount of time with no additional fabrication or alteration to the existing truck fill station or alteration of the water trucks. Forestry has implemented the practice of filling their water trucks at this site when near the area. This approach is estimated to save 690,000 gallons and \$2,500 annually. Through 2016, it will save an estimated 2,415,000 gallons and \$8,800.

**Initiate a pilot project to determine the feasibility of reducing water used for street sweeping.**

In order to suppress dust and increase effectiveness, the City's street sweepers utilize water when sweeping. Depending on the degree to which water conservation may be prioritized above aesthetics and the mitigation of nuisance (and potentially hazardous) dust issues, dry sweeping could be employed at various levels. To better ascertain what level of implementation may be most appropriate, the Maintenance Division will conduct a 3-month pilot study, as follows.

The waterless street sweeping pilot study will be conducted over the three month period beginning July 1, 2013 and ending September 30, 2013. Initially, operators will be instructed to sweep without water, in general. However, in the interest of safety, operators will be empowered to commence water use when and if ever, in their judgment, a potentially hazardous condition exists. Initially, the trial approach will extend to all road types and settings, during both the day and at night, in the interest of evaluating:

- The level of acceptance/suitability when implemented on various types of streets (residential, arterial, expressways, etc.)
- The level of acceptance/suitability when implemented within various settings (residential, commercial, industrial, etc.)
- The level of acceptance/suitability when implemented at different times of the day (daytime, nighttime)
- The level of additional equipment maintenance/repair required, if any

Evaluation will be made based on the following measures:

- Frequency of potentially hazardous dust plumes, as identified by operators
- Volume of registered concerns regarding dust-related health or nuisance issues

- Volume of registered concerns regarding aesthetics
- Quantity and value of any private property damage claimed as the result of airborne sweepings
- Frequency of required mechanical repair
- Frequency of required broom replacement

Conclusions will be implemented during the course of the pilot study, coalescing in either a refined approach, to be continued beyond the pilot study period, or a recommendation to discontinue waterless sweeping, upon the study's end. Results from the pilot project and a final recommendation will be brought before the City Council by the end of December, 2013. Annual water savings, if any, will vary dramatically depending on the final approach, from roughly 250,000 to 2,000,000 gallons. The pilot will closely monitor the impact on air quality that street sweeping with reduced water may have. There are no health concerns related to dust dispersal from sweeping, but staff will place high importance on any nuisance or visual issues that may arise from the dust.

**Create a capital improvement project that would reduce water usage at the City golf courses.**

The five City golf courses have been transitioning tees and fairways to warm season grasses for several years as funds have been available. Establishing warm season grasses on all remaining fairways and tees that are irrigated with City water would require the replacement of approximately 12.55 acres of cool season turf. Rather than replace all the turf at once (prohibitively expensive) or using seed (interrupts play, high failure rate) a technique called strip sodding can be applied where 12 inch swaths of new sod are installed alongside 12 inch swaths of existing grass. Over the course of two growing seasons the new sod eventually overtakes and replaces the existing grass. This technique has the advantage of not disrupting play while the conversion is underway while cutting the upfront costs in half. The upfront conversion cost is estimated at just over \$63,000 and would save just under 983,000 gallons in the first year. After the grass is established (year two) savings jump to approximately 1,356,000 gallons and \$4,950 per year. Based on projected savings, the project would pay for itself in 10.5 years. Staff will work to validate these numbers, create a detailed implementation plan that includes impacts on course utilization, and bring the project before the City Council for approval by the end of August 2013.

**Draft new landscaping design guidelines.**

Anytime the City hires a consulting firm to design any road, sewer, drainage, or water line, the firm is required to follow the City's landscaping design guidelines in their design. These guidelines mainly apply to medians and right-of-way. Staff in Public Works – Engineering are working to update the guidelines to exclude any plants not listed as "water-wise" by Kansas State University and the Sedgwick County Extension Office. Staff will work with area landscape experts in the private sector on additional updates to the guidelines that will maximize water savings while maintaining aesthetic value. The updated guidelines will be brought before the City Council for approval by the end of the summer season.

**Improve response times for irrigation and water system leaks.**

The Departments of Public Works and Utilities and Park and Recreation will each fill one top priority vacant position responsible for repairing irrigation and water system leaks. In addition, both Departments will perform a cost/benefit analysis on the use of overtime to increase leak responsiveness. This analysis will culminate in an overtime policy proposal for the City Manager's approval.

**Experiment with alternative maintenance schedules to determine the feasibility of reducing water used to inspect fire hydrants.**

Fire hydrants need to be regularly inspected to ensure they stay in good working order and are operational for emergencies. Currently, the Fire Department inspects each of the 17,000 fire hydrants every year. An estimated 500 gallons of water are used for each inspection, totaling 8,500,000 gallons each year. The Fire Department will experiment over the next two years with the following approaches to minimize water usage while maintaining public safety service levels:

- Inspect all hydrants bi-annually
  - Inspecting all hydrants only every other year will save approximately 4,250,000 gallons and \$15,500 annually
- Reduce the number of hydrants inspected each year by  $\frac{1}{4}$ 
  - Reducing the number of hydrants by  $\frac{1}{4}$  would realize a savings of 2,125,000 gallons and \$7,750 annually
- Use nozzles on hydrants to significantly reduce the amount of water that flows out

**Eliminate water usage for the Community Risk Reduction program.**

The Fire Department historically participated in about 60 events between June and August in which children are sprayed down by firefighters as part of the Community Risk Reduction program. Firefighters used a number of ways to spray down participants, such as small hand lines and large diameter nozzles. An estimated 1,500 gallons of water were used for each event, totaling 90,000 gallons and \$320 annually. Through 2016, eliminating the spray downs will save 315,000 gallons and \$1,120. The Department may use their Mobile Prevention Unit (mobile smoke training trailer) as an alternative event to the spray-downs.

**Upgrade irrigation technology to use water more efficiently.**

Staff from Public Works and Utilities and Park and Recreation will form a team to study available irrigation technology and best practices and formulate recommendations on steps the City should take. Recommendations will be made by the end of the 2013 summer season.

**Determine the feasibility of utilizing additional water sources.**

Staff will determine the feasibility of utilizing each of the following water sources and will make administrative changes and/or bring projects to the City Council for approval as necessary:

- Utilize Hess Pump Station pump cooling water for irrigation at Botanica
- Utilize sump pump system water from City Hall for on-site irrigation
- Recycle water treatment plant sampling streams
- Recycle water from washing out concrete trucks
- Recycle water from vehicle wash-bays at the Central Maintenance Facility and Transit facilities
- Capture water from hard surfaces (parking lots, roofs) via cistern systems
- Install a watershed pond at LW Clapp to catch water runoff for use in irrigation

**Determine the feasibility of reducing water usage through technological upgrades.**

Staff will determine the feasibility of each of the following ideas, and will bring projects to the City Council for approval as necessary:

- Installing motion activated faucets in all City restrooms
- Upgrade the cooling towers on all City buildings
- Install low water usage plumbing fixtures throughout the City