Introduction

Texas State University

Irrigation Conservation Plan

March 2013

**Introduction**

As per the revised drought ordinance adopted by the San Marcos City Council in June 2012, golf

courses and athletic fields may choose to follow either the general stage restrictions and their

associated watering schedules, or may submit an irrigation conservation plan that establishes

alternative means to achieve water reduction during drought stages.

An irrigation conservation plan is defined as a plan that outlines specific measures to be taken

during drought stages to progressively reduce consumption in higher drought stages. The plan

must include an irrigation system maintenance plan and an irrigation system analysis, and must

meet reduction goals as established by the director.

Texas State University is submitting this Irrigation Conservation Plan (Plan) as an alternative to

the standard drought ordinance. The Plan proposes to progressively reduce the university's

overall irrigation water usage during drought stages, instead of reducing usage at individual

sites. Overall usage includes irrigation at all offices, parks, athletic fields, and other facilities that

are irrigated with City water. Reducing overall irrigation usage instead of site irrigation usage

allows the university to prioritize irrigation sites and maintain safe playing surfaces while

reducing overall irrigation water usage during drought.

**Conservation Goals**

The goal of Texas State's Irrigation Conservation Plan is to reduce overall baseline irrigation

water usage during drought stages as follows:

Stage 1: 10% reduction from baseline

Stage 2: 20% reduction from baseline

Stage 3: 25% reduction from baseline

Stage 4: 30% reduction from baseline

Stage 5: 35% reduction from baseline

Overall baseline water usage was established using historical monthly metering data from 2008,

2009 and 2011. City of San Marcos billing data was used for sites where dedicated irrigation

meters are present. Water usage at new and recently acquired sites that do not have metering

history was estimated based on square footage and water usage from other sites.

To determine overall baseline water usage, a monthly average was calculated for each site

using 2008, 2009 and 2011 data. The averages were added together to achieve quarterly

baseline water budgets. Percentage reductions were calculated for each drought stage from

the quarterly overall baseline water budget.

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|  | **Baseline Water Budget** | **Stage 1: 10% Reduction** | **Stage 2: 20% Reduction** | **Stage 3: 25% Reduction** | **Stage 4: 30% Reduction** | **Stage 5: 35% Reduction** |
| Quarter 1 (Jan-Mar) | 3,052,657 | 2,747,391 | 2,442,126 | 2,289,493 | 2,136,860 | 1,984,227 |
| Quarter 2 (Apr-Jun) | 6,500,348 | 5,850,314 | 5,200,279 | 4,875,261 | 4,550,244 | 4,225,226 |
| Quarter 3 (Jul-Sep) | 9,928,595 | 8,935,736 | 7,942,876 | 7,446,446 | 6,950,017 | 6,453,587 |
| Quarter 4 (Oct-Dec) | 4,610,503 | 4,149,452 | 3,688,402 | 3,457,877 | 3,227,352 | 2,996,827 |

**Implementation**

Overall water usage will be reduced by decreasing and/or eliminating irrigation usage, beginning with low-priority sites such as office buildings and parking lots. Water usage at medium-priority sites such as parks and practice fields will be reduced next, and usage at high-priority sites such as athletic fields will be reduced last. The goal of the Plan is to reduce overall usage as per the goals established above, while maintaining safe playing conditions.

Texas State will submit monthly meter readings to the City to demonstrate that the overall water usage goals are being met.

**Irrigation System Best Management Practices**

*Irrigation metering* - Texas State utilizes irrigation submeters at sites that do not have dedicated City irrigation meters. All submeters are read monthly and water usage is tracked.

*Irrigation scheduling* - Texas State has a dedicated staff person to adjust irrigation schedules based on ET data, changes in usage, special events, drought, and other considerations. As resources permit, Texas State will add additional soil moisture sensor-controlled systems which will reduce and possibly eliminate the need for human intervention for scheduling.

*Master meters* - The majority of Texas State's irrigation systems have master valves to shut off water flow to the mainline when the system is not in use. In the event of a mainline leak, the master valve will prevent water losses while the system is off. Some new sites, such as Swinney House, do not currently have master valves but the university plans to add them to all sites.

*Flow sensor/shutoff devices* - Many of Texas State's irrigation systems have flow sensor-shutoff devices that constantly monitor flow conditions and automatically shut down the system if flows outside of set parameters are detected.

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Rain/soi/ moisture shutoff devices- Texas State utilizes rain and/or soil moisture sensors at all sites to reduce or eliminate water usage when supplemental irrigation is not needed.

Irrigation audits and inspections - Irrigation staff members perform irrigation system inspections on all systems annually. Irrigation system audits are performed every two years on sites over 10,000 square feet, and every three years on all other sites. Audits are based on TEEX methodology for turf areas, and inspections for shrub, groundcover, and drip zones.

Artificial turf- Texas State installed artificial at Bobcat Stadium in 2003, replacing 81,200 square feet of grass turn with Astroplay, a product made of rubber and polyethylene fibers. Converting the field to artificial turf has saved approximately 2.1 million gallons of water per year.

Central control system - Texas State utilizes a central control system that constantly monitors irrigation systems and provides alerts when problems are detected.