**Sustainability proposal**
Big Urbie: Darr Rainwater Reclamation

Submitted by:

Maxwell Wagner

Submitted on:

2/24/2014

Missouri State University

Student Government Association

1. **Identification of Sponsors**
	1. **Project Sponsors**
		* 1. Max Wagner

 1001 East Madison Street - Shannon Room #500

 Springfield, MO 65807

(913) 952-3799

Wagner16@live.missouristate.edu

* 1. **Faculty/Staff advisor** (insert faculty/staff contact information below)

1. Jen Cox

 Associate Director of Facilities Management

 901 South National Avenue

 Springfield, MO 65897

 (417) 836-8931

 JenCox@missouristate.edu

2. Stacey Armstrong

 Projects Manager

 Watershed Committee of the Ozarks

 320 N. Main Ave.

 Springfield, MO 65806

 (417) 866-1127

 Stacey@watershedcommittee.org

* 1. **Project Manager**
		+ 1. Maxwell Wagner

**II. Description of Proposed Project**

1. **General Description of Proposal**

The Rainwater Reclamation Project purposes capturing, storing, and using rainwater for non-potable uses.

**b. Proposal Details**Currently, rain water gathers around the Pinegar Arena at the Darr Agriculture Center. This water runs off and is not utilized in any fashion. The basic idea is to install 10 water retention tanks located to the east of the parking lot adjacent to Pinegar Arena. These tanks will have the potential to hold up to 20,000 gallons of rainwater. The water would be utilized inside Pinegar Arena as part of the dust suppression system already in use inside the arena. This utilization of rain water would displace the domestic water we are currently using for this purpose.


Specs (as seen in picture above):
The average usage of water in the arena varies depending on the temperature and humidity. The arenas are generally watered several times per week for approximately one hour per arena. When the temperature is high and humidity is low they are watered daily. The water flow at the end of the hose is 12 gal/min.  Two arenas at one hour application would receive approximately 1500 gal per watering. Depending on humidity and the frequency with which the arenas are watered the university could potentially save anywhere from 90,000 to 500,000 gallons/year. Currently, water purchased from City Utilities is done so at a rate of $1.39 per one thousand gallons. With the projected water savings, the University will save anywhere from $125.10-$695.00 per year.

**c. Proposed location for the object of the proposal**
The project site is the northeast side of Pinegar Arena.

**d. Alternative Uses**If the tanks are persistently full indicating an excess in captured water, it would be possible to direct water from the tanks to other grey water uses such as irrigation.

**e. Drawbacks**
Construction interference with events at Pinegar, however would be negligible if done during the summer.

1. **Estimated Cost of the Project**$22,000
	1. **Provisions of Alternatives in Order of Preference**
	We are unaware of a less expensive option. If necessary, commencement of the project can be delayed to allow time for accumulation of additional funds.
	2. **Provisions of Complete Cost Breakdowns**

|  |  |
| --- | --- |
|  |  |
| Category | **Estimated Cost** |
| General Conditions  | $560 |
| Existing Conditions | $700 |
| Concrete | $2,244 |
| Equipment | $13,835 |
| Plumbing Material | $318 |
| Electrical | $4,478 |
| Earthwork | $9,121 |
| Exterior Improvements | $1,660 |
| Labor | $31,390 |
| Subtotal | $64,326 |
| 5% Contingency | $3,216 |
| 5% Fee | $3,216 |
| Total | $70,759 |
| Big Urbie Grant | ($42,455.40) |
|  | $28,303.60 |
| 10% Contingency | $2830.36 |
| TOTAL ESTIMATED COST | **$31,133.96** |

* 1. **Provisions of any Ongoing Costs**
	All ongoing costs will be absorbed by facilities, as they are accepting responsibility for the project from implementation forward.
1. **Estimated Completion Time of Project**
An accurate schedule for the project has yet to be determined. The Big Urbie grant expires in March 2015 so the project must be completed by that date.
2. **Estimated Life of Project**
There is a two year warranty on the tanks. The expected lifetime of these tanks is about 40 years.
3. **Justification of Project**
Harvesting rainwater using the proposed methods would create a practical opportunity for the university to reduce its consumption of one our community’s most important resources: clean water. In terms of economy, using reclaimed water will reduce university expenditures on water purchased from municipal source. Considering the amount of water consumed by tempering, great potential exists for significant savings.

Finally, this is another great opportunity for Missouri State University to fulfill its public affairs. By taking a bold step towards water conservation, our water is both doing a service to the community and local environment, as well as demonstrating itself as a community leader. Reclaiming excessive water runoff is an environmentally responsible action, which yields great potential for accountability to the community and increased profit to the university.
4. **University Support**
Jennifer Cox, Michael Klem