WHO

WHY

WHAT

COST

YOUR COST

VALUE

CONCLUSION
How Much Water Does it Take?

- Burger: 634 gallons
- Bed: 2800 gallons
- Car: 39,000 gallons
- Glass of Milk: 53 gallons
“Do you really think people will pay for a coconut full of water when they can get it from the stream for free?”
WHAT
Water System - Three Aspects

- Supply (enough)
- Treatment (safe)
- Delivery (available)
Unique Water System

Over 60 pumps
4 dams
2 treatment plants
Certified lab
1254 miles of pipe
7,771 hydrants
31,830 valves
30-60 mgd
About 200 tests daily
Just in time planning
WHAT

Maintenance/Distribution
COST
Source

$1.5 million

1 year
$45 million
$25,000 annually

$2.4 million
ALLOCATION OF STORAGE SPACE FOR USES

- Flood Control
- Usable Storage
- Hydropower

Elevation:
- 892
- 867
- 830
REALLOCATION OF STORAGE SPACE FOR DRINKING WATER

$4.6 million—1993

$7.8 million—2013

$20 million—partially meet regional need

$15,000-100,000 per year for share of reservoir operating costs
$3.5 million

$400,000

$50,000

$1000/day

$12 million
$20,000-$30,000
## Quality

### Chemicals

#### 2013 Water Treatment Chemical Usage Summary

<table>
<thead>
<tr>
<th></th>
<th>Blackman Water Treatment Plant</th>
<th>Fulbright Water Treatment Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average PPM</td>
<td>Average PPM</td>
</tr>
<tr>
<td>CHLORINE (GAS FEED)</td>
<td>94,600 LBS.</td>
<td>82,750 LBS.</td>
</tr>
<tr>
<td></td>
<td>1.87</td>
<td>2.78</td>
</tr>
<tr>
<td>CHLORINE GENERATED ON-SITE</td>
<td>127,171 LBS.</td>
<td>142,280 LBS.</td>
</tr>
<tr>
<td></td>
<td>2.51</td>
<td>1.24</td>
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<tr>
<td>FLUORIDE</td>
<td>136,150 LBS.</td>
<td>168,940 LBS.</td>
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<tr>
<td></td>
<td>0.70</td>
<td>5.67</td>
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<tr>
<td>SODA ASH</td>
<td>109,372 LBS.</td>
<td>18,000 LBS.</td>
</tr>
<tr>
<td></td>
<td>2.16</td>
<td>0.60</td>
</tr>
<tr>
<td>CARBON</td>
<td>30,600 LBS.</td>
<td>715 LBS.</td>
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<tr>
<td></td>
<td>0.60</td>
<td>0.02</td>
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<tr>
<td>POTASSIUM PERMANGANATE</td>
<td>3,489 LBS.</td>
<td>316,395 LBS.</td>
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<tr>
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<td>0.07</td>
<td>10.62</td>
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<tr>
<td>PAC4090</td>
<td>718,225 LBS.</td>
<td></td>
</tr>
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<td></td>
<td>14.16</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$384,170.16</strong></td>
<td><strong>Total</strong></td>
</tr>
<tr>
<td><strong>Combined Total Cost</strong></td>
<td></td>
<td><strong>$609,309.03</strong></td>
</tr>
</tbody>
</table>

*Note: Costs are approximate and subject to change.*
BWTP On-site Generation

Initial Start Up: April 2013
Fully Operational
System designed and installed in-house. $3 million
Laboratory

Total Number of Tests  >100,000

$1.9 million
$175,000

$800,000

Water
Hammer

Priceless
$2 million
Disruptions=Aging Infrastructure

Pipes don’t last forever... ultimately, they will need to be replaced –

Maintenance
Aging Infrastructure

Water Main by Decade of Installation

- Decade 1800's: 16.9 miles
- Decade 1900-1919: 6.1 miles
- Decade 1910-1929: 8.9 miles
- Decade 1920-1929: 29.0 miles
- Decade 1930-1939: 11.9 miles
- Decade 1940-1949: 23.7 miles
- Decade 1950-1959: 121.2 miles
- Decade 1960-1969: 118.2 miles
- Decade 1970-1979: 180.6 miles
- Decade 1980-1989: 182.4 miles
- Decade 1990-1999: 181.4 miles
- Decade 2000-2013: 155.7 miles

Unknown Decade: 155.7 miles
Proposed Water System Improvement Plan

• Working toward a 100 year cycle

• $5 Million in 2017 ($500,000/mile)

• Allows 10 miles of pipe replacement
Industry

Publications frequently reference 100 year cycle

$1 trillion over the next 25 years nationwide
Maintenance = Control Costs

Unaccounted For Water = Energy and Chemical Costs

10 yr avg pumping cost
$1.6 million annually

Chemicals
$600,000-900,000 annually
• Budget this year

• $32 million

• $22 million capital

• $10 million non capital
Your Cost

1 gallon – 50 cents

Cable for a day-$2

100 gallons-60 cents

1 gallon-$3

1 gallon-$2-3
Cost $2

For $2 from the tap = 4000 TIMES
Cost to Customers

• Average customer used 57,000 gal/yr

• Average annual bill $341

• Or--$5.99 for every 1000 gallons

• 93 cents a day for your family’s drinking, bathing, flushing, laundry, lawn watering, and other water uses
VALUE

To Us

True Value
TO US
11.88 gpcd

850,000 people

10 mgd

5 minutes instead of 10 =

5 mgd saved
5 flushes/day/person
850,000 people

3.5 gpf = 14.9 mgd

1.6 gpf = 6.8 mgd

8.1 mgd saved
31.7 gpcd—Outdoor use
(car wash, cleaning, pools, yard)

29 gpcd—lawns

850,000 people

24.7 mgd

½ = 12.35 mgd saved
5 mgd

8.1 mgd

12.35 mgd

25 + mgd

4 - 7 %
“High volume outdoor water use for lawn watering is often associated with single family residential accounts. These customers tend to be well educated, affluent, professional people who desire large, lush, well maintained turf areas.”

Conservation Manager, Johnson County Kansas
We made too many wrong mistakes.
Yogi Berra
We know the worth of water when the well runs dry.

Benjamin Franklin

Graphic from book “Unquenchable”
Author – Robert Glennon
Courtesy of Martha Witaker
True Value
“my baby, my baby---”
The human race is challenged more than ever before to demonstrate our mastery—not over nature but of ourselves.

Rachel Carson