WASTE WATER TREATMENT AND USE OF RECLAIMED WATER

ELIMINATE SALINITY IN THE WASTEWATER STREAM

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PROJECT PARAMETERS

• Community partnership with the Rio Verde Community
• The Challenge Area: Waste Water Treatment and the Use of Reclaimed Water
• Our Objective: To reduce the salinity levels entering into the waste water stream
• Questions
  • What is the salt being used for?
  • How is it getting into the waste stream?
  • How do we stop it?
PROJECT OVERVIEW

WHAT IS THE SALT BE USE FOR?

HARD WATER

- Water hardness is measured by the amount of dissolved calcium and magnesium.

<table>
<thead>
<tr>
<th>Classification</th>
<th>mg/l or ppm</th>
<th>grains/gal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft</td>
<td>0 – 17.1</td>
<td>0 - 1</td>
</tr>
<tr>
<td>Slightly Hard</td>
<td>17.1 - 60</td>
<td>1 - 3.5</td>
</tr>
<tr>
<td>Moderately Hard</td>
<td>60 - 120</td>
<td>3.5 - 7.0</td>
</tr>
<tr>
<td>Hard</td>
<td>120 – 180</td>
<td>7.0 10.5</td>
</tr>
<tr>
<td>Very Hard</td>
<td>180 &amp; Over</td>
<td>10.5 &amp; Over</td>
</tr>
</tbody>
</table>

Mean hardness as calcium carbonate at NASQAN water-monitoring sites during 1975 water year. Colors represent site data representing streamflow from the hydrologic-unit area. (Map edited by USEPA, 2003)
IS HARD WATER A PROBLEM? MAYBE NOT

- Natural hard water:
  - Contains Calcium, Magnesium, and Iron
  - Helps to fight and prevent certain heart and cardiovascular diseases
  - Part of a healthy diet
IS HARD WATER A PROBLEM? MAYBE NOT OR, MAYBE IT IS!

• Pro’s of Natural Hard Water:
  • Contains Calcium, Magnesium, and Iron
  • Helps to fight and prevent certain heart and cardiovascular diseases
  • Part of a healthy diet

• Con’s of Natural Hard Water:
  • Correlation with eczema
  • Dry sticky feeling left on the skin and dull hair (scum build up)
  • Taste
  • Reduces the efficiency and life expectancy of household appliances and clothes

• Softened Water
  • Greatly reduced or no scum build up
  • Mostly void of Calcium, Magnesium, and Iron
  • Maintains the efficiency and life expectancy of household appliances and clothes
HOW DOES THE WATER SOFTENER WORK?
HOW DOES THE WATER SOFTENER WORK?
SALTLESS WATER SOFTENER
HOW HAS THE PROJECT PROGRESSED?

Meeting with Sal and Team Heads at Rio Verde Community

Meeting with Mike Kleminski, owner of Rio Verde Utilities (in charge of both water input and water output)

Research (data collected from Mike, Internet research, Audubon Society contact)

Today!
RESULTS AND FINDINGS

- The portable exchange water softening system does more harm than good, and moves the problem of wastewater elsewhere (does not truly take care of the problem)
- Salt-less water softening is a more environmentally-friendly option
- Policy change in the current sustainability markers: track salinity in water as a way to track impact of the chosen water softener
PORTABLE EXCHANGE VS SALT-LESS SYSTEMS

PORTABLE EXCHANGE

• $35 - $48 PER MONTH; ACTUAL UNIT IS AROUND $600 (CONTROLLED BY THE COMPANY)

• PAYING FOR SERVICE; BUSINESS COMES OUT, REPLACES USED PE UNIT WITH A NEW ONE, TAKES THE USED ONE TO THEIR FACILITY AND RECHARGE IT THERE

• EXternality of moving salty wastewater off-site

SALT-LESS WATER SOFTENING

• EXAMPLE: NUVO H2O

• MORE ECO-FRIENDLY, LESS SALT IN THE WATER

• ~$640 FOR INSTALLATION, NEW FILTER EVERY 3 – 6 MONTHS; $80 FOR NEW FILTER

• COST COMES OUT TO BE VERY SIMILAR TO THE PE PROCESS, BUT MORE ECO-FRIENDLY (MADE OF RECYCLABLE PARTS, FILTRATION INCLUDED, CITRA CHARGE A MORE ENVIRONMENTALLY-FRIENDLY)
IGNORANCE IS NOT BLISS

• BIGGEST PROBLEM WITH POPULARIZING THE USE OF RECLAIMED WATER IS PUBLIC OPINION SURROUNDING IT
• MOST PEOPLE THINK IT IS UNSAFE, UNSANITARY/TOO HIGH OF RISKS
  • "TOILET TO TAP"
• MOST RECLAIMED WATER IS HIGHER IN QUALITY THAN IS REQUIRED FOR MOST APPLICATIONS
• RIO VERDE COMMUNITY ALREADY OPEN TO USING RECLAIMED WATER IS A GOOD START
POPULAR OPINION RULES THE DAY

• GAINING A COMMUNITY BACKING FOR A DIFFERENT SYSTEM WILL MAKE IT EASIER TO IMPLEMENT SOMETHING NEW

• EDUCATE THE COMMUNITY MEMBERS

• AGAIN ALREADY OPEN TO RECLAIMED WATER
  • SHOULDN'T BE HARD TO GAIN POPULAR SUPPORT

• SAME BENEFITS/RISKS JUST BETTER FOR THE ENVIRONMENT

• KEEP THE PUBLIC EDUCATED
IT’S ALL ABOUT THAT GREEN
IT’S ALL ABOUT THAT GREEN

• UP-FRONT COST APPEARS TO BE MORE FOR THE HOMEOWNER, SINCE THE UNIT IS ACTUALLY INSTALLED AND OWNED BY THE RESIDENTS (RATHER THAN BEING CONTROLLED BY COMPANY)

• OVER TIME, INVESTMENT COMES OUT TO BE VERY SIMILAR

• OVERCOME THE INITIAL INVESTMENT FOR LONG-TERM SUSTAINABLE BENEFIT
<table>
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<tr>
<th>Hole</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>Out</th>
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<tbody>
<tr>
<td>Blue</td>
<td>671/139</td>
<td>412/798</td>
<td>539/400</td>
<td>397/212</td>
<td>432/543</td>
<td>178/427</td>
<td>359/427</td>
<td></td>
<td></td>
<td>Total</td>
</tr>
<tr>
<td>White</td>
<td>71.9/134</td>
<td>382/490</td>
<td>379/370</td>
<td>197/413</td>
<td>511/154</td>
<td>389/328</td>
<td>6</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Green</td>
<td>68.2/126</td>
<td>352/462</td>
<td>358/343</td>
<td>182/391</td>
<td>418/130</td>
<td>151/305</td>
<td>130/</td>
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<td>Par</td>
<td>4</td>
<td>5</td>
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<td>5</td>
<td>3</td>
<td>4</td>
<td>36</td>
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<tr>
<td>Handicap</td>
<td>14</td>
<td>4</td>
<td>12</td>
<td>10</td>
<td>16</td>
<td>2</td>
<td>6</td>
<td>18</td>
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**HOW DO WE KEEP SCORE?**

**POLICY OR POLICE**
How Do We Keep Score?

POLICY OR POLICE

**POLICY**

- Incentives to remove softeners using salt
- Policy that once a softener needs replacing, no new salt softeners
- Voluntary registration of household softener units
- Incentives to install no-salt softeners

**POLICE**

- Home to home inspection and registration of salt softener systems
- Mandatory scheduled replacement of salt systems to no-salt systems
- Monetary incentive to change (fines)
How Do We Keep Score?

POLICY OR POLICE

**POLICY**
- INCENTIVES TO REMOVE SOFTENERS USING SALT
- POLICY THAT ONCE A SOFTENER NEEDS REPLACING, NO NEW SALT SOFTENERS
- VOLUNTARY REGISTRATION OF HOUSEHOLD SOFTENER UNITS
- INCENTIVES TO INSTALL NO-SALT SOFTENERS

**POLICE**
- HOME TO HOME INSPECTION AND REGISTRATION OF SALT SOFTENER SYSTEMS
- MANDATORY SCHEDULED REPLACEMENT OF SALT SYSTEMS TO NO-SALT SYSTEMS
- MONETARY INCENTIVE TO CHANGE (FINES)
CHALLENGES AND UNKNOWNNS

How many water softeners are still in the community?

Lack of usable data
From The Well Of Information
(Works Cited)


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