Public Acceptance: How is it shaping up for Potable Reuse projects?

Mark Millan

Patricia Tennyson
Recycled Water: How Safe is It?

Putting the Risk of Recycled Water into Perspective

What is Recycled Water and Why Do We Use It?

Recycled Water Exposure Scenario

Child at Play

The child is 33-pounds and plays on the grass at a playground one day per week immediately following irrigation with tertiary-treated recycled water, which occurs six months of the year (26 days). He/she plays for one hour each day and his/her entire hands, forearms, and lower legs are wet with recycled water for the entire hour. The child indirectly ingests 10 milliliters of recycled water during each play session, which is estimated to be 1/5 the amount of water ingested by a child who swims for an hour. The exposures evaluated include absorption through the skin and incidental ingestion.

This is a high estimation of the amount of water to which a typical child at play could be exposed. This is done purposely to build extra margins of safety into the risk assessments in this study (see reverse). The scenario not only represents a child on a playground, but also at the park or on a school athletic field.
The Word is Out

Source: Marsi Steirer
IPR Success

Groundwater Replenishment System

From toilets to tap: How we get tap water from sewage

The Wall Street Journal

Sewer to Spigot: Recycled Water

In an effort to replenish its groundwater supply, Los Angeles is scheduled to announce Thursday a plan that will recycle 4.9 billion gallons of treated wastewater to drinking standards by 2016. In San Diego, the city council voted in favor of a pilot project that would pump recycled sewage water into a drinking-water reservoir, despite a vote from the majority over the system’s cost. Miami-Dade County, Fla., is planning a system that would pump 35 million gallons a day of purified wastewater into the ground; the water will eventually travel to a supply well and be reclaimed for drinking use.

Source: Marsi Steirer
WASTEWATER COULD BECOME MAIN WATER SOURCE
NEW NUMBERS SHOW POTENTIAL FOR SAN DIEGO
TOILET TO YOUR TAP!

Why are Sacramento & Stockton allowed to Dump their Sewage into the Delta/Aqueduct Water?

THE WATER SOURCE FOR 20 MILLION PEOPLE DOWNSTREAM!
WateReuse DPR Research

- Project 13-02 conducted in 2014
- Focus on potable reuse – IPR & DPR
- California-centric research
- Communication plans developed:

“Model Communication Plans for Increasing Awareness and Fostering Acceptance of Direct Potable Reuse”
Building Public Acceptance of Direct Potable Reuse of Recycled Water

Key Findings from Opinion Research

320-601 / 330-194

Fairbank, Maslin, Maullin, Metz & Associates - FM3
Public Opinion Research & Strategy

SANTA MONICA • OAKLAND • MADISON • MEXICO CITY
Opponents are largely concerned about potential health impacts of some kind.

Why would you **OPPOSE** indirect reuse of recycled water for drinking in your community?

- Don’t trust/Unfamiliar with filtering/Quality standards: 36%
- Unsafe/Unclean/Health concerns: 29%
- Just don’t want to drink it/Personally reuse: 11%
- Don’t want to drink sewer water: 10%
- No process is 100% effective/Some pathogens/toxins can never be removed (includes medications): 9%
- Don’t know enough about it: 7%
- Chemicals are used in treatment of water: 4%
- Possible contamination of natural water sources/groundwater/rivers: 4%
- “Human factor”; potential for human error/negligence in water treatment: 3%
- Mistrust of government: 2%
- Lack of available test/study/research results: 2%
- Will taste bad: 1%

Q12b. Open end; Responses grouped; Asked of indirect potable reuse opponents only
Verbatim Comments from Indirect Potable Reuse Opponents

I think if it is landscaping water this won’t be good because of all the minerals that are toxic in the water.

I’m not clear what their “high standards” are, and it makes me nervous.

Honestly, as soon as you said “sewer water” I was opposed. I don’t know. I just don’t want to drink sewer water.

Even though it is treated, it can never be 100% treated for germs. It can only be 99 percent free of all viruses.

Because it is not safe and it is very, very dirty. It has chlorine, pee, and other garbage in the water.

I feel the safeguards aren’t there. It would be done by the government, and wouldn’t be done very well.

12b. Why would you OPPOSE indirect reuse of recycled water for drinking in your community? Open end; Responses grouped; Asked of indirect potable reuse opponents only.
Why would you **OPPOSE** direct reuse of recycled water for drinking in your community?

- Don’t trust filtering process/system: 40%
- It would be unhealthy/unsafe to drink: 26%
- Just don’t want to/feel comfortable drinking it: 19%
- Don’t want to drink “sewer water”: 10%
- Don’t know enough about it: 7%
- Concerned of more chemicals in water (used to clean it): 3%
- “Human factor”; potential for human error/negligence in water treatment: 3%
- No process is 100% effective/Some pathogens/toxins can never be removed (includes medications): 3%
- Lack of available test/study/research results: 2%
- Will taste bad: 2%
- Too expensive: 1%
- Don’t trust city officials to ensure water quality: 1%
It’s a mental thing. The idea that it was once sewage…it’s a mental thing that you have to get over.

There is a chance of unintentional violations of the process that might cause contamination.

I just want to be sure that the water district filters it enough to drink. I don’t trust the water district to do that correctly.

I oppose direct reuse of recycled water. Chemicals from industry can leave toxins in the water.

I think there are educational barriers which will put people back to drinking bottled water, which is bad for the environment.

I would like to see other cities in the U.S. implement it first. At this time, I don’t think it is 100% safe.

I would only oppose it for drinking. I don’t think science has the right answers for purifying it for drinking at this time.
Safety concerns drive reservations about direct potable reuse.

I am going to read you a list of concerns some members of the public have expressed about direct reuse of recycled water for drinking. Please tell me whether you personally agree or disagree with that concern.

<table>
<thead>
<tr>
<th>Concern</th>
<th>Total Agree</th>
<th>Total Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recycled water may include contaminants</td>
<td>72%</td>
<td>24%</td>
</tr>
<tr>
<td>Recycled water may fail to meet water safety standards</td>
<td>66%</td>
<td>30%</td>
</tr>
<tr>
<td>Recycled water may taste bad</td>
<td>52%</td>
<td>38%</td>
</tr>
<tr>
<td>The concept of recycled water just makes me uncomfortable</td>
<td>49%</td>
<td>49%</td>
</tr>
</tbody>
</table>
OCT 08 2013

To the Members of the California State Senate:

I am signing SB 322 which requires the Department of Public Health in consultation with the State Water Resources Control Board, to investigate the feasibility of developing uniform water recycling criteria for direct potable reuse by September 2016.

This information is past due. In an effort to enhance the use of recycled water, I have proposed the consolidation of the management of the drinking water program and all other water quality programs, including recycled water, under the State Water Board.

I am directing the Water Board to ensure that this work is completed expeditiously. The 3-year time frame mandated in this bill is too slow. California needs more high quality water and recycling is key to getting there.

Sincerely,

[Signature]

Edmund G. Brown Jr.
Potable Reuse Benchmarks in the U.S.

Source: Daniel Gerrity
Addressing health and safety concerns (water quality, PPCPs/CECs, exposure to diseases)

Costs to ratepayers

“Yuck” factor/toilet-to-tap

Building trust with community members

Regulations/regulators

Inconsistent language
More environmentally responsible
- Familiarity results in support/less fear
- With little knowledge: casually supportive or strongly opposed
- Brine disposal is an area of great concern
- Other concerns: safety and cost
Majority support IPR (62%)
Initially most oppose DPR – but support goes to 56% with information about safety
Treatment steps alone build support
Testing/monitoring influence support
Environmental message next most effective
Chemicals in Water Alter Gender of Fish

Pollution Brings Worrying Signs for Fish Populations; Worse, Most U.S. Drinking Water Comes from the Same Sources

Tap water contaminant 'castrates' frogs

By Liz Szabo, USA TODAY

Urine for a Surprise

A recent Michigan State University study indicates that hormone-laden human urine, not industrial chemicals, could be triggering reproductive abnormalities in male fish near Lake Mead, Nevada. Researchers testing the waters of

The Washington Post

Six years later, gender-bending fish in our water supply remain a mystery

Source: Shane Snyder
### Table 2 - SAMPLING RESULTS FOR SODIUM AND HARDNESS

<table>
<thead>
<tr>
<th>Chemical or Constituent (and reporting unit)</th>
<th>Sample Date</th>
<th>Level Detected</th>
<th>Range of Detections</th>
<th>MCL</th>
<th>PHG (MCLG)</th>
<th>Typical Source of Contaminant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium (ppm)</td>
<td>2/25/03</td>
<td>19.49</td>
<td>7.1 - 37</td>
<td>no MCL</td>
<td>no PHG</td>
<td>Generally found in ground and surface water</td>
</tr>
<tr>
<td>Hardness (ppm)</td>
<td>2/25/03</td>
<td>115.58</td>
<td>58 - 100</td>
<td>no MCL</td>
<td>no PHG</td>
<td>Generally found in ground and surface water</td>
</tr>
</tbody>
</table>

### Table 3 - DETECTION OF CONTAMINANTS WITH A PRIMARY DRINKING WATER STANDARD

<table>
<thead>
<tr>
<th>Chemical or Constituent (and reporting unit)</th>
<th>Sample Date</th>
<th>Level Detected</th>
<th>Range of Detentions</th>
<th>MCL</th>
<th>PHG (MCLG)</th>
<th>Typical Source of Contaminant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barium (ppm)</td>
<td>2/25/03</td>
<td>.067</td>
<td>ND .2</td>
<td>1 ppm</td>
<td>2 ppm</td>
<td>Discharges of oil drilling wastes and from metal smelting; erosion of natural deposits</td>
</tr>
<tr>
<td>Nitrate (ppm)</td>
<td>2/25/03</td>
<td>1.87</td>
<td>ND - 5.6</td>
<td>45 as nitrogen</td>
<td>10 as N</td>
<td>Runoff and leaching from fertilizer use; leaching from sanitary wastes and sewage commingling with natural deposits</td>
</tr>
<tr>
<td>Fluoride (mg/L)</td>
<td>2/25/03</td>
<td>.10</td>
<td>ND - .21</td>
<td>2.0 mg/L</td>
<td>1.0 mg/L</td>
<td>Fluoride of natural deposits; runoff from agricultural and urban areas</td>
</tr>
<tr>
<td>Arsenic (mg/L)</td>
<td>2/25/03</td>
<td>7.33</td>
<td>ND - .22</td>
<td>50 ug/L</td>
<td>N/A</td>
<td>Fluoride of natural deposits; runoff from agricultural and urban areas</td>
</tr>
<tr>
<td>TTHMs (ug/L)</td>
<td>11/23/01</td>
<td>14.65</td>
<td>4.3 - 28.0</td>
<td>60 ug/L</td>
<td>N/A</td>
<td>Byproduct of drinking water chlorination</td>
</tr>
<tr>
<td>Haloacetic Acids (ug/L)</td>
<td>11/23/01</td>
<td>4.7</td>
<td>1.3 - 9.2</td>
<td>60 ug/L</td>
<td>N/A</td>
<td>Byproduct of drinking water disinfection</td>
</tr>
</tbody>
</table>

### Table 4 - DETECTION OF CONTAMINANTS - SECONDARY DRINKING WATER STANDARD

<table>
<thead>
<tr>
<th>Chemical or Constituent (and reporting unit)</th>
<th>Sample Date</th>
<th>Level Detected</th>
<th>Range of Detentions</th>
<th>MCL</th>
<th>Typical Source of Contaminant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfate (mg/L)</td>
<td>2/25/03</td>
<td>10.88</td>
<td>2.9 - 18.0</td>
<td>500 mg/L</td>
<td>Runoff/leaching from natural deposits and industrial waste</td>
</tr>
<tr>
<td>Chloride (mg/L)</td>
<td>2/25/03</td>
<td>13.93</td>
<td>5.4 - 21.0</td>
<td>500 mg/L</td>
<td>Runoff/leaching from natural deposits and seawater influence</td>
</tr>
<tr>
<td>Specific Conductance (millisiemens/cm)</td>
<td>2/25/03</td>
<td>399.17</td>
<td>230 - 560</td>
<td>1,600 millisiemens/cm</td>
<td>Substances that form from the water's natural weathering and leaching from natural deposits</td>
</tr>
<tr>
<td>Total Dissolved Solids (mg/L)</td>
<td>2/25/03</td>
<td>200.3</td>
<td>120 - 250</td>
<td>1000 mg/L</td>
<td>Runoff/leaching from natural deposits</td>
</tr>
<tr>
<td>Color (units)</td>
<td>2/25/03</td>
<td>2.58</td>
<td>ND - 5.0</td>
<td>15 units</td>
<td>Naturally-occurring organic materials</td>
</tr>
<tr>
<td>Color Threshold (units)</td>
<td>2/25/03</td>
<td>.33</td>
<td>ND - 1.0</td>
<td>3 units</td>
<td>Naturally-occurring organic materials</td>
</tr>
<tr>
<td>Turbidity (units)</td>
<td>2/25/03</td>
<td>.46</td>
<td>.02 - .05</td>
<td>5 units</td>
<td>Soil runoff</td>
</tr>
</tbody>
</table>

### Table 5 - DETECTION OF UNREGULATED CONTAMINANTS

<table>
<thead>
<tr>
<th>Chemical or Constituent (and reporting unit)</th>
<th>Sample Date</th>
<th>Level Detected</th>
<th>Action Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bromo (ug/L)</td>
<td>1/15/03, 2/25/03, 6/25/00</td>
<td>158.3 ug/L</td>
<td>1,000 ug/L</td>
</tr>
</tbody>
</table>
Voters are confident that it is possible to treat recycled water to drinking water quality standards.

Do you believe that it is possible to further treat recycled water used for irrigation to make the water pure and safe for drinking?
... but even those who believe that do not necessarily accept the idea of potable reuse.

Acceptability of Recycled Water for Drinking by Belief in its Feasibility

- Total Acceptable
- Total Unacceptable
- Neutral/DK/NA

- Think it is Possible to Recycle Water for Drinking: 47% (65% of Sample)
- Do Not Think it is Possible: 89% (22% of Sample)
- Don't Know/NA: 63% (13% of Sample)

9e. I am going to read you a list of potential uses for recycled water. Please indicate whether you consider each item to be a completely acceptable, somewhat acceptable, somewhat unacceptable, or completely unacceptable use for recycled water. Drinking Water
Potable Reuse Challenges

“Toilet to Tap”

Environmental Justice

CECs, Unknown Contaminants

Political Cycles

Competing Water Supplies
Those Opposed
Women express a higher degree of discomfort with DPR than do men.

### Initial DPR Support by Gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Total Support</th>
<th>Total Oppose</th>
<th>Don't Know/NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>44%</td>
<td>49%</td>
<td>7%</td>
</tr>
<tr>
<td>Women</td>
<td>36%</td>
<td>57%</td>
<td>7%</td>
</tr>
</tbody>
</table>

(48% of Sample)

13 Total. Would you support or oppose the *direct* reuse of recycled water in your community?
The youngest voters are comfortable with DPR, but support declines with age.

**Initial DPR Support by Age**

- **Total Support**
- **Total Oppose**
- **Don't Know/NA**

<table>
<thead>
<tr>
<th>Age</th>
<th>Total Support</th>
<th>Total Oppose</th>
<th>Don't Know/NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-29</td>
<td>58%</td>
<td>5%</td>
<td>16%</td>
</tr>
<tr>
<td>30-39</td>
<td>45%</td>
<td>7%</td>
<td>18%</td>
</tr>
<tr>
<td>40-49</td>
<td>34%</td>
<td>7%</td>
<td>21%</td>
</tr>
<tr>
<td>50-64</td>
<td>35%</td>
<td>7%</td>
<td>11%</td>
</tr>
<tr>
<td>65-74</td>
<td>38%</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>75+</td>
<td>54%</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>18-49</td>
<td>45%</td>
<td>6%</td>
<td>50%</td>
</tr>
<tr>
<td>50+</td>
<td>34%</td>
<td>7%</td>
<td>50%</td>
</tr>
<tr>
<td>65+</td>
<td>34%</td>
<td>7%</td>
<td>21%</td>
</tr>
</tbody>
</table>

13. Total. Would you support or oppose the direct reuse of recycled water in your community?
Combining these variables, women over 50 stand out as key opponents.

*Initial DPR Support by Gender by Age*

- **Men**
  - 18-49: 47% Support, 6% Oppose, 8% Don't Know/NA
  - 50+: 41% Support, 12% Oppose, 6% Don't Know/NA

- **Women**
  - 18-49: 43% Support, 29% Oppose, 6% Don't Know/NA
  - 50+: 64% Support, 7% Oppose, 6% Don't Know/NA

13 Total. Would you support or oppose the direct reuse of recycled water in your community?
GOP voters also have significant initial reservations.

Initial DPR Support by Party

- **Democrats**: 41% Support, 51% Oppose, 7% Don't Know/NA
- **Independents**: 45% Support, 49% Oppose, 6% Don't Know/NA
- **Republicans**: 31% Support, 63% Oppose, 6% Don't Know/NA

13 Total. Would you support or oppose the direct reuse of recycled water in your community?
Though a small sub-sample, African Americans have more reservations than others.

Initial DPR Support by Ethnicity

- **Latinos**
  - Total Support: 39%
  - Total Oppose: 53%
  - Don't Know/NA: 8%
  - (% of Sample): (16%)

- **African-Americans**
  - Total Support: 33%
  - Total Oppose: 63%
  - Don't Know/NA: 3%
  - (% of Sample): (6%)

- **Asians/Pacific Islanders**
  - Total Support: 39%
  - Total Oppose: 56%
  - Don't Know/NA: 5%
  - (% of Sample): (12%)

- **Whites**
  - Total Support: 41%
  - Total Oppose: 51%
  - Don't Know/NA: 7%
  - (% of Sample): (56%)

- **Voters of Color**
  - Total Support: 40%
  - Total Oppose: 54%
  - Don't Know/NA: 6%
  - (% of Sample): (39%)

13 Total. Would you support or oppose the direct reuse of recycled water in your community?
Though support for DPR increases with education, even highly-educated voters are opposed…

Initial DPR Support by Education

13 Total. Would you support or oppose the direct reuse of recycled water in your community?
Parents have more concerns about DPR than do those without children at home.

Initial DPR Support by Children at Home

- **Total Support**
  - Have Kids at Home: 34%
  - No Kids at Home: 42%

- **Total Oppose**
  - Have Kids at Home: 57%
  - No Kids at Home: 52%

- **Don't Know/NA**
  - Have Kids at Home: 8%
  - No Kids at Home: 6%

13. Total. Would you support or oppose the direct reuse of recycled water in your community?
Identifying Persuadables
Though they are initially opposed, voters quickly become more comfortable with direct potable reuse after information about safety.

Do you support or oppose direct reuse of recycled water in your community for all household purposes, including drinking?

<table>
<thead>
<tr>
<th></th>
<th>Initial Support</th>
<th>After Safety Information</th>
<th>After Messages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Oppose</strong></td>
<td>54%</td>
<td>56%</td>
<td>59%</td>
</tr>
<tr>
<td><strong>Total Support</strong></td>
<td>40%</td>
<td>39%</td>
<td>36%</td>
</tr>
<tr>
<td><strong>Don’t Know/NA</strong></td>
<td>7%</td>
<td>5%</td>
<td>5%</td>
</tr>
</tbody>
</table>
Segmenting the Population by Consistency of Support for DPR

- **Consistent Support**: Voters who consistently indicated they would support direct potable reuse of recycled water.

- **Consistent Oppose**: Voters who consistently indicated they would oppose direct potable reuse of recycled water.

- **Swing**: Voters who do not fall into any of the other categories – remaining consistently undecided or switching positions.

The following slide shows demographic groups that disproportionately fall into one category or the other.
# Demographic Profiles of the Segments

<table>
<thead>
<tr>
<th>Consistent Support</th>
<th>Swing</th>
<th>Consistent Oppose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>38% of the Electorate</strong></td>
<td><strong>31% of the Electorate</strong></td>
<td><strong>32% of the Electorate</strong></td>
</tr>
<tr>
<td>Ages 18-29</td>
<td>Ages 75+</td>
<td>Interviewed in Spanish</td>
</tr>
<tr>
<td>Independents Ages 18-49</td>
<td>Women Ages 50+</td>
<td>African-Americans</td>
</tr>
<tr>
<td>Independent Men</td>
<td>Non-College Educated Women</td>
<td>High School Educated</td>
</tr>
<tr>
<td>College-Educated Men</td>
<td>Whites</td>
<td>Republicans</td>
</tr>
<tr>
<td>Men Ages 18-49</td>
<td>Santa Clara</td>
<td>Republicans Ages 50+</td>
</tr>
<tr>
<td>Democrats Ages 18-49</td>
<td>Democratic Women</td>
<td>Republican Women</td>
</tr>
<tr>
<td>Democratic Men</td>
<td>Republican Women</td>
<td>Republican Men</td>
</tr>
<tr>
<td>Ages 18-49</td>
<td>Interviewed in English</td>
<td>Republicans Ages 18-49</td>
</tr>
<tr>
<td>Use All/Mostly Cell Phone</td>
<td>Women</td>
<td>Women Ages 50+</td>
</tr>
<tr>
<td>Men</td>
<td>Ages 50+</td>
<td>Latinos</td>
</tr>
<tr>
<td>Interviewed on Cell Phone</td>
<td>College-Educated Women</td>
<td>Voters of Color</td>
</tr>
<tr>
<td>Renters</td>
<td>Ages 50-64</td>
<td>Use All/Mostly Landline</td>
</tr>
<tr>
<td>HH Income $50,000-$100,000</td>
<td>Have Children at Home</td>
<td>Have Children at Home</td>
</tr>
<tr>
<td>San Diego</td>
<td>Post-Graduate Educated</td>
<td>Ages 65+</td>
</tr>
</tbody>
</table>
Those with positive attitudes toward their water agency are more accepting of DPR.

Initial DPR Support by Water Agency Favorability

- Total Favorable: 43% Total Support, 50% Total Oppose, 7% Don't Know/NA
- Total Unfavorable: 29% Total Support, 69% Total Oppose, 2% Don't Know/NA
- Neutral/DK/NA: 40% Total Support, 53% Total Oppose, 7% Don't Know/NA

13 Total. Would you support or oppose the direct reuse of recycled water in your community?
Most voters do not drink water straight from the tap.

Thinking about the water that you drink at home, do you most often drink?

- **Tap water that is filtered in your home, either at the sink, through the refrigerator, or through a pitcher**: 45%
- **Unfiltered water straight from the tap**: 21%
- **Bottled water**: 31%
- **Other/DK/NA**: 3%

**Total Not Tap Water**: 76%
Interestingly, those who actually drink unfiltered tap water are more accepting of DPR.

Initial DPR Support by Primary Source of Water at Home

13 Total. Would you support or oppose the direct reuse of recycled water in your community?
Top messengers are generally those with scientific expertise.

I am going to read you a list of people and organizations that may provide information about recycled water. Please tell me if you would generally trust that person’s or organization’s opinion on this issue, or if you would be suspicious of it.

<table>
<thead>
<tr>
<th>Organization</th>
<th>Total Trust</th>
<th>Total Suspicious</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Department of Public Health</td>
<td>77%</td>
<td>19%</td>
<td>+58%</td>
</tr>
<tr>
<td>Medical researchers</td>
<td>74%</td>
<td>20%</td>
<td>+54%</td>
</tr>
<tr>
<td>Medical doctors</td>
<td>72%</td>
<td>22%</td>
<td>+50%</td>
</tr>
<tr>
<td>Scientists</td>
<td>71%</td>
<td>23%</td>
<td>+48%</td>
</tr>
<tr>
<td>Nutritionists</td>
<td>67%</td>
<td>20%</td>
<td>+47%</td>
</tr>
<tr>
<td>The Environmental Protection Agency</td>
<td>71%</td>
<td>24%</td>
<td>+47%</td>
</tr>
<tr>
<td>Residents of community that already have potable reuse</td>
<td>65%</td>
<td>22%</td>
<td>+43%</td>
</tr>
</tbody>
</table>

Q22. *Not Part of Split Sample*
• Potable reuse provides a safe, reliable and sustainable drinking water supply.

• Using advanced purified water is good for the environment.

• Potable reuse provides a locally controlled, drought-proof water supply.
one glass at a time . . .

Helping people understand

Potable Reuse

A Flexible Communication Plan
for use by Public Information Professionals

Sample of tools being made available
Potable Reuse Summary
Commonly Referred to as Purified Water

Understanding Potable Reuse —
A Key Part of Our Water Supply Solutions

Numerous regions of the world are experiencing drought and resulting lack of water supplies. While using purified water for drinking is not new, innovative projects in Australia, Texas, California and elsewhere are living examples of advanced purification practices being used to increase scarce water supplies.

Water Reuse Happens Naturally

The term “potable” water means “suitable for drinking.” Water reuse, including potable reuse, happens naturally all over our planet — on rivers and water bodies everywhere. If your community is downstream from another, chances are you are reusing its water and likewise communities downstream from you are most likely reusing your water.

Reused or recycled water is water used more than one time before it passes back into the natural water cycle. It is waste water, including sewage, which has been treated or purified to a level that allows for reuse for beneficial purposes.

Potable Reuse — Direct and Indirect

Potable reuse refers to water meeting all federal and state drinking water standards and is safe for human consumption. Potable reuse may be created by indirect potable reuse (IPR) or direct potable reuse (DPR).

Water Terminology for Potable Reuse

The messages here introduce new terminology for potable reuse. Namely, “advanced purified water” or, “purified water.” This reflects the preferred terminology from the focus groups and telephone surveys conducted in the WRF-13-02 project. The research clearly demonstrates that “potable reuse” and “direct potable reuse” are not understood by the mainstream population and that, even when explained, they do not resonate well.

WaterReference direct potable reuse (DPR) and indirect potable reuse (IPR) as “potable reuse.” This is fine when talking among those in your agency and industry, but the public neither recognizes nor understands the term — we will substitute “purified water” from here forward.

To Learn More

WaterReuse is a nonprofit organization whose mission is to promote and advance the benefits of water reuse through education, outreach, research, and membership. We believe that better water management will lead to a better society. To learn more visit WaterReuse.org.
Top Three Key Messages

Potable reuse provides a safe, reliable and sustainable drinking water supply.

Using advanced purified water is good for the environment.

Potable reuse provides a locally controlled, drought-proof water supply.

Key Messages Explained

Potable reuse, or purified water as described below, uses advanced, multi-stage treatment to provide a safe, reliable and sustainable drinking water supply.

Here are some tested and useful message bullets:

- Proven engineered treatment processes are used to purify water to a level that is safe to drink.
- Purifying water is a "multi-barrier process" designed to separate water from pollutants.
- There are various treatment processes to accomplish this objective.
- Purified water is tested, in real-time, with online sensors and will be strictly monitored by the Department of Health.
- Purified water will comply with or exceed strict state and federal drinking water standards.
- The purification process produces water that is more pure than most bottled waters.
- Purified water is currently used to supplement drinking water in many communities in the United States and around the world. There have been no problems from using purified water to augment drinking water supplies.

At times it may be advantageous to include a more detailed description of the advanced technological processes used to purify recycled water. In such instances, the following language is an example of how to describe the microfiltration/reverse osmosis/ultraviolet light treatment train:

- The water first goes through microfiltration, a pretreatment process, where water is pumped through tubes filled with tiny membranes. Each membrane is made up of hollow fibers, perforated with holes 1/300th the width of a human hair! As the water moves through the tubes, solids and bacteria are caught in the fibers.
- The water then goes through reverse osmosis where it’s forced through membranes that remove salt and microorganisms, including viruses, bacteria and most chemicals of emerging concern.
- Now the water is very clean, but one more step ensures its safety: exposing the water to ultraviolet light to cause any remaining organic molecules to break down.

Using advanced purified water is good for the environment.

The more recycled water we use for whatever purpose we use it, the less we have to take out of our streams and our scarce groundwater supplies. This is good for rivers and streams.
Develop Informational Materials

The following are strategies for developing informational materials:

- Make available easy-to-understand materials highlighting key messages appropriate for target audiences and provide them in print and electronic formats; consider using QR codes and social media platform strategies;
- Develop materials tailored to the interests of specific audiences;
- Ensure all materials are responsive to multicultural, multiethnic, and age-specific audiences; translate key items into other languages as needed;
- Consistently update all materials (both electronic and print) to make sure designated audiences, including agency employees, have timely and accurate materials;
- Link to other places that provide information about purified water projects.

Menu of Informational Materials and Tools

Libraries and Databases
- Graphics “catalog”
- Quote/Cite bank
- Mailing list
- Centralized internal information station

Other
- Learning/visitor’s center at the advanced water treatment facility
- Key messages card
- Sponsor/committee cards

Speakers Bureau
- Detailed information on strategies & activities for creating your speakers bureau are available at www.waterreuse.org.

Web and Digital
- Website
- Presentations
- E-newsletter
- Program DVD
- Quarterly videos

For more detailed and helpful information on each of these bulleted items see section 5.10 of the WRWF 13-02 report.

Sample Timeline on reverse

What is Potable Reuse?

Potable reuse refers to purified water that you can drink. It’s highly treated to meet or exceed federal and state drinking water standards and is safe for human consumption. How purified reused water is different determined if it is called as indirect potable reuse (IPR) or direct potable reuse (DPR).
### History of Potable Reuse in California

<table>
<thead>
<tr>
<th>Phase 1: Seawater Barriers</th>
<th>Phase 2: IPR</th>
<th>Phase 3: IPR-DPR Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Actors, Projects</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seawater barriers</td>
<td>West Basin barrier, Chino Basin barrier, Opposition to IPR (L.A., San Diego, San Gabriel)</td>
<td>Pure Water San Diego, Silicon Valley Advanced Water Purification Center, Padre Dam Advanced Water Purification Center, Pure Water Monterey</td>
</tr>
<tr>
<td>Orange County Water Factory 21</td>
<td>OCWD Groundwater Replenishment System</td>
<td>DPR system</td>
</tr>
<tr>
<td></td>
<td>DPR system</td>
<td></td>
</tr>
<tr>
<td><strong>Institutions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NWRI</td>
<td>State Water Recycling Goals</td>
<td>Senate Bill 918 Expert Panel reports to CA Legislature</td>
</tr>
<tr>
<td>WRRF</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Several DPR reports (NRC, WRRF, NWRI)</td>
<td>Expert Panel draft recommendations due DPR workshop</td>
</tr>
<tr>
<td></td>
<td>Criteria and Standards for potable reuse and alternatives</td>
<td>DPR Research continues NRWI Advisory Panel submits comments to Expert Panel</td>
</tr>
<tr>
<td></td>
<td>Issues in potable reuse</td>
<td></td>
</tr>
<tr>
<td></td>
<td>WateReuse DPR initiative</td>
<td></td>
</tr>
</tbody>
</table>

#### Networks, Research

- Research Needs for the Potable Reuse of Municipal Wastewater
- NRC report: Issues in potable reuse
- Criteria and Standards for potable reuse and alternatives

#### Timeline

- 1970
- 1980
- 1990
- 2000
- 2010
- 2014
- 2016

---

**Based on chart created by Christian Bain/eawag. Modified by WRRF 2015**

**NWRI = National Water Research Institute, WRRF = WateReuse Research Foundation, IPE = Indirect Potable Reuse, DPR = Direct Potable Reuse**

---

### Recycled Water Treatment

1. Wastewater
2. Primary
3. Secondary
4. Tertiary/Advanced
5. Recycled Water

### Multi-Barrier Water Purification Steps

1. Membrane Filtration
2. Reverse Osmosis
3. UV/Advanced Oxidation
4. Aquifer/Reservoir
5. Drinking Water Treatment
6. Drinking Water Supply

---

**Water Purification Process**

- **Non-potable uses**
- **Potable Reuse**
# Key Plan Element Prioritization and Timeline

An example of a timeline you can adapt for your own public outreach planning.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>MONTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review existing communication materials (internal and external)</td>
<td></td>
</tr>
<tr>
<td>Review the literature</td>
<td></td>
</tr>
<tr>
<td>Develop draft key messages for testing</td>
<td></td>
</tr>
<tr>
<td>Identify key stakeholders</td>
<td></td>
</tr>
<tr>
<td>Build mailing list/contact database</td>
<td></td>
</tr>
<tr>
<td>Conduct in-depth interviews</td>
<td></td>
</tr>
<tr>
<td>Conduct focus groups and baseline survey</td>
<td></td>
</tr>
<tr>
<td>Finalize key messages</td>
<td></td>
</tr>
<tr>
<td>Develop or modify Community-Level Communication Plan</td>
<td></td>
</tr>
<tr>
<td>Create communication tools</td>
<td></td>
</tr>
<tr>
<td>- info materials</td>
<td></td>
</tr>
<tr>
<td>- speakers bureau and training</td>
<td></td>
</tr>
<tr>
<td>- media training</td>
<td></td>
</tr>
<tr>
<td>- webpages and social media</td>
<td></td>
</tr>
<tr>
<td>- IAP</td>
<td></td>
</tr>
<tr>
<td>Create a Rapid Response Plan</td>
<td></td>
</tr>
<tr>
<td>- identify a core team</td>
<td></td>
</tr>
<tr>
<td>- conduct spokesperson training</td>
<td></td>
</tr>
<tr>
<td>- create template articles for media</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>18</td>
</tr>
</tbody>
</table>

Ongoing

Ongoing as needed
Opinion Leader Outreach

Goals of Opinion Leader Outreach

- Establish or enhance the relationship between the opinion leader and the agency;
- Build awareness, trust, and confidence in purified water treatment technology processes;
- Inform leaders of water supply demands and shortages and how purified water can meet demands;
- Listen to their stakeholders and be responsive to concerns related to purified water project implementation;
- Secure written support of purified water projects from strategic community and opinion leaders.

Identifying Opinion Leaders

Each community will have its own unique set of influencers, which will likely change and grow as the project progresses. Keeping an accurate database of opinion leaders, contact information, preferred communication methods, and other pertinent notes is imperative to a successful outreach program.

It’s important to identify the leaders and their staff. Characteristics include: appalled or elected position, value and trust, comprehensive expertise, and social position. Opinion leaders can include, but are not limited to, the following (in alphabetical order):

- industry/education leaders
- business organizations
- civic groups
- environmental entities
- media
- medical, public health, and water quality experts
- multi-cultural and faith-based leaders and groups whose leadership/leadership groups may be found within the other audiences listed
- state and local elected officials and their staff

Relationship of opinion leaders to other target audiences

The graphic below illustrates the opinion leaders in relation to other key community members. These groups from which information emanates are other community members, opinion leaders must be made aware of the need by purifying water supply systems and should be knowledgeable about purified water as an option.

Rapid Response Plan

Rapid Response Plan Activities

Rapid Response Team

Identify a core team within the agency that is designated as the rapid response team. This team should include the board chair, the CEO, legal counsel, operations staff, communication staff, and customer service staff. This group should meet periodically to review potential scenarios and strategize responses. When a crisis occurs, convene the team immediately to develop a specific response.

Message Development

Develop three key messages in response to the situation or event and share those with key staff and board members. These are the messages that should be included in all written and verbal communication about the event.

Employee Communication

Employees are one of the most important stakeholders in a crisis or rapid response situation, and they are often forgotten because of other pressing issues, such as responding to media inquiries and ensuring the safety of the agency’s customers. An all-employee e-mail should be developed and distributed with the details of the event and the agency’s response. This communication should also include the contact information for someone at the agency who can answer employee questions. This needs to be the assigned responsibility of a designated employee.

“Dark” Web Pages and Public Notices

Create web pages and public notices for potential crisis situations and keep them ready to upload/print in the event of an actual crisis.

Phone Lists

Keep up-to-date phone lists (both hard and electronic versions) with home and cell phone numbers of board members, agency management, and elected officials, as well as staff from other local agencies.

Op-eds and Letters to the Editor

Address inaccurate news coverage by writing letters to the editor and submitting op-ed articles stating the agency’s position. Always include appropriate agency messages to leverage any opportunity for providing correct information about possible water issues.

Media Outreach

Identify one spokesperson or select spokespeople for the agency staff (the board members will likely be contacted and speak for themselves) and ensure that all employees know to direct any inquiries to that designated person or persons. The identified spokesperson/representatives should be aware of the key messages developed and should incorporate them as they respond to media questions.

Social Media

The strategy behind the Rapid Response Plan is to be a living document that provides guidelines and recommendations for how the agency should work to provide a consistent and prompt communication response.

Strategy

The strategy behind the Rapid Response Plan is to create a social media presence that provides information to the public and updates on the project's progress.
Public Acceptance: How is it shaping up for Potable Reuse projects?

Mark Millan

Phone: 707.836.0300
Email: Millan@DataInstincts.com
Any new water project can face opposition.

Robust public outreach programs:
- Increase community awareness
- Build trust
- Contribute to understanding and support
Opposition Happens

- Opposition CAN’T be totally controlled
- Opposition CAN develop at any time
- Opposition may not be able to be neutralized

You need a good “insurance policy” – an effective outreach program.
Model Communication Plans

- Basic approach: Listen, Learn, Adapt
- Local Community Level
  - Customize to meet your specific needs
  - Tailor questions to your demographics
- State Level
  - Aimed at legislators/staff
Community Level Communication Plan

- Public acceptance primary challenge
- Build awareness: need, benefits, safety, high quality water
- Messaging, terminology
- Audience-driven; opinion leader focus
- Targets, strategies, activities, measurable objectives
Three Key Guidelines

- Define purpose/need
- Identify range of community interests, understand concerns and issues
- Outreach must be consistent and sustained or no one will remember the program/project
Consistency Counts

- Orange County’s GWRS is a model
  - Leadership at board and staff level
  - Research-based messages
  - Effective multi-cultural outreach
  - Frequent briefings: policy makers/media
  - Comprehensive, sustained outreach program

“We talked to anyone who would listen to us!”
Outreach Lessons Learned

- Ensure water agency is project lead
- Emphasize importance/need for *all* local water supply sources
- Correct inaccuracies immediately
- Conduct repeated policy maker briefings
- Identify/work with strong third-party allies
More Outreach Lessons

- Emphasize the urban water cycle!
- Terminology matters
- Know your community
- Tours/tasting opportunities
- Media outreach/social media
- “Go to them” vs. “Come to us”