Direct Potable Reuse
Observations and Lessons Learned

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Evolution of Potable Reuse

Montebello Forebay

Water Factory 21

San Diego Reservoir Augmentation
Observation – Surface water discharge regulations provide driver for DPR

- State Board policy prompts potable reuse

- IPR limitations
  - Regulatory requirements associated with surface water discharges
  - Conveyance and retreatment infrastructure requirements ($)

[Images of water treatment facilities]
Observation: Full advanced treatment provides sufficient level of barriers

- Microfiltration/Ultrafiltration
- Reverse Osmosis
- Ultraviolet Light / Hydrogen Peroxide

_Issue is “infallible reliability”_
Observation—There is no such thing as “infallible reliability”

<table>
<thead>
<tr>
<th>Organism</th>
<th>Log Reduction Required</th>
<th>Log Reduction Obtained</th>
<th>Secondary/Tertiary Treatment</th>
<th>Membrane Filtration</th>
<th>Reverse Osmosis</th>
<th>UV Disinfection</th>
<th>Advanced Oxidation</th>
<th>Surface Water Augmentation</th>
<th>Treatment at Drinking Water Plant</th>
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<tbody>
<tr>
<td>Cryptosporidium</td>
<td>10</td>
<td>18</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>6</td>
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<tr>
<td>Giardia</td>
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<td>19</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>6</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Viruses</td>
<td>12</td>
<td>16</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>6</td>
<td></td>
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</table>
Observation - Incremental approach helps bring public along
Observation – Gain support of business and environmental community and leverage

Friends of Infrastructure
Observation – Rate impact is last, toughest question
Observation – DPR will require some amount of salt removal (RO)

Full advanced treatment

Alternative treatment (no RO)

RO provides tool in salt/nutrient management
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Inland Empire WateReuse Chapter