

# **Status of Expert Panel Efforts DPR - Potable Reuse**

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Panel Co-Chairs**

***April 8, 2016  
Advisory Group Meeting***

# Topics Covered

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- ***March Panel Meeting Focus***
  - ***Status of Briefing Papers/Chapters***
  - ***Reliability Briefing Paper/Chapter Review***
  - ***Chemical Monitoring Briefing Paper/Chapter***
  - ***Panel Feasibility Report Outline***
- ***Approach for Evaluating Feasibility of DPR Criteria***
- ***Panel Schedule***

# DPR Briefing Paper Topics & Status

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- ***Expert Panel Feasibility Report Outline – well underway***
- ***Briefing paper topics (Internal):***
  - ***Bioassays (Bioanalytical Tools) – NEARING COMPLETION***
  - ***Quantifying Treatment Facility Reliability – Well Underway***
  - ***Analytical Methods/Tools – Well Underway***
  - ***Molecular and Other Pathogen Monitoring Methods - outline***
  - ***Antibiotic Resistant Bacteria (ARB) and Antibiotic Resistant Genes (ARG) in water – NEARING COMPLETION***
  - ***Comparative Health Risks – Well Underway***
  - ***Public Health Surveillance – Underway (rely on WRRF 14-14)***

# Panel Feasibility Report -Chapters

- **Executive Summary**
- **1 – Introduction**
  - Overview of Potable Reuse
  - Public Health Considerations as a Condition of Potable reuse
  - NRC report on Potable Reuse
  - Defining Tolerable Level of Public Health Risk
  - Recycled Water as a Potable Water Source/Supply
- **2 – Potential Hazards for Potable Reuse**
  - Potential Hazards
  - Public Health Surveillance Tools

# Panel Feasibility Report -Chapters

- **3 – Monitoring Potential Hazards**
  - Analytical methods and tools for measuring chemical water quality
  - Application of bioanalytical tools (i.e., *in vitro* bioassays) to water
  - Molecular and other methods for monitoring pathogens in water.
  - Antibiotic resistant bacteria and antibiotic resistant genes.
- **4 - DPR System Performance:**
  - Description of the DPR alternative treatment systems.
  - Quantifying treatment facility reliability (i.e., performance and mechanical).
  - Feasibility Analysis (Approach & Example)
  - Source Control

# Panel Feasibility Report -Chapters

- **5 – Management Controls**
  - operation and maintenance, operator training and certification, and financial/institutional requirements and challenges
- **6 - Panel Findings and Recommendations.**
  - Overall Panel Findings Relative to Charge
  - Recommendations (Feasibility, Implementation and Research Needs)

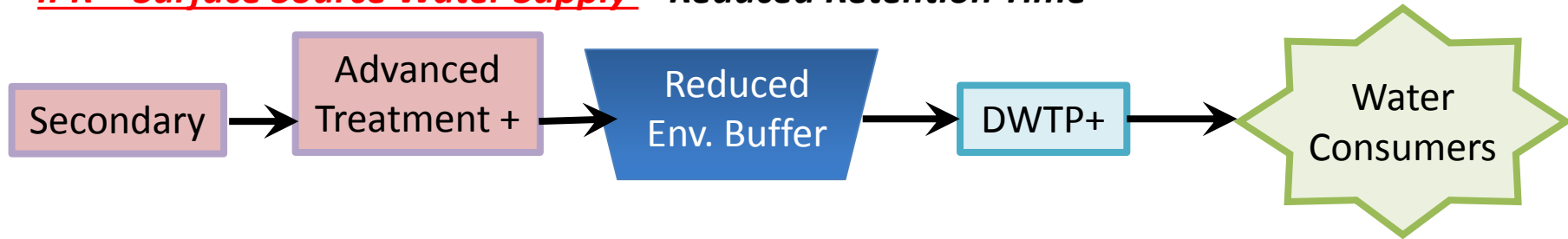
# Feasibility Analysis

## Potable Reuse Configurations - Example

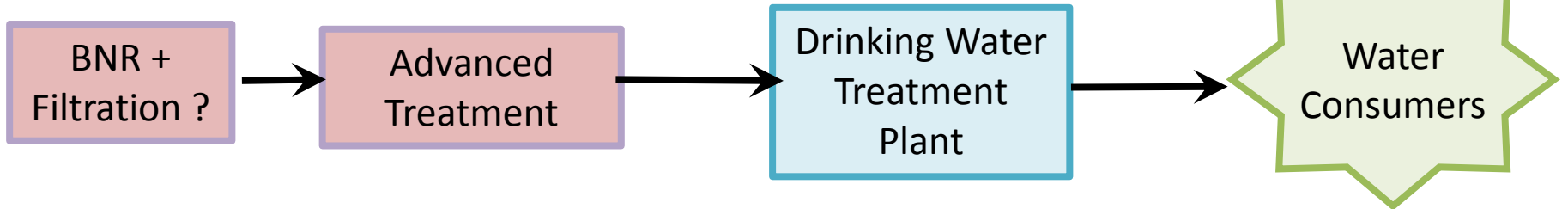
- **Comparative Approach –**
  - **Tolerable Goal:**  $10^{-4}$  ppy, annual risk of infection
  - **Relative comparison:**
    - Baseline - Sacramento-San Joaquin River (Delta) and IPR alternatives (GWR and Surface Water Augmentation)
    - Source Water Supply – Reduced Environmental Buffer
    - DPR Alternatives (several)
  - **Probabilistic approach :**
    - LRV criteria for *Cryptosporidium* relative to DPR Performance
    - Unit process performance and mechanical reliability

# Potable Reuse – Potential Water Supply Options

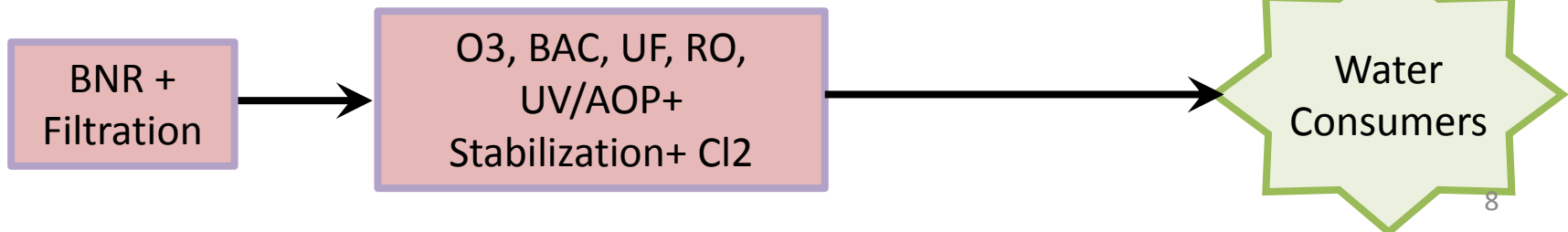
## IPR – Surface Source Water Supply – Reduced Retention Time



## *DPR - Advanced Treated Water as Approved Raw Water Supply*

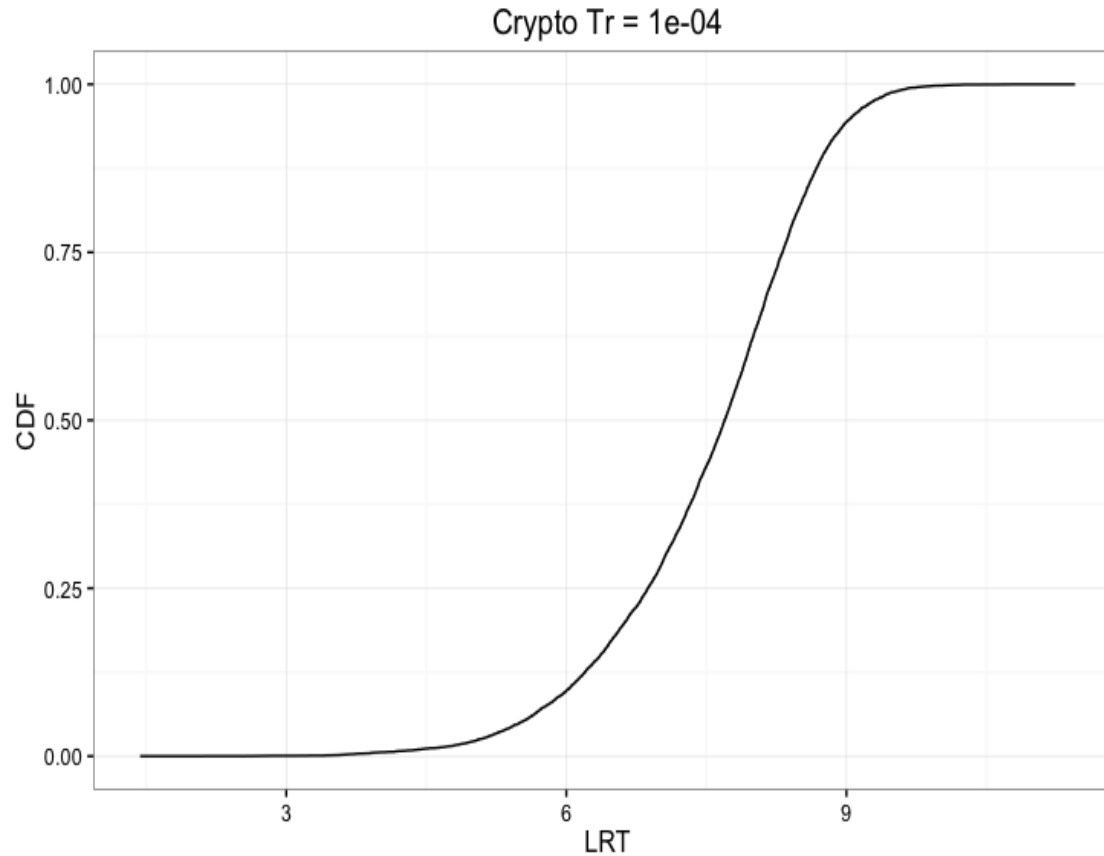


## *DPR - Advanced Treated Water as Approved Finished Drinking Water*





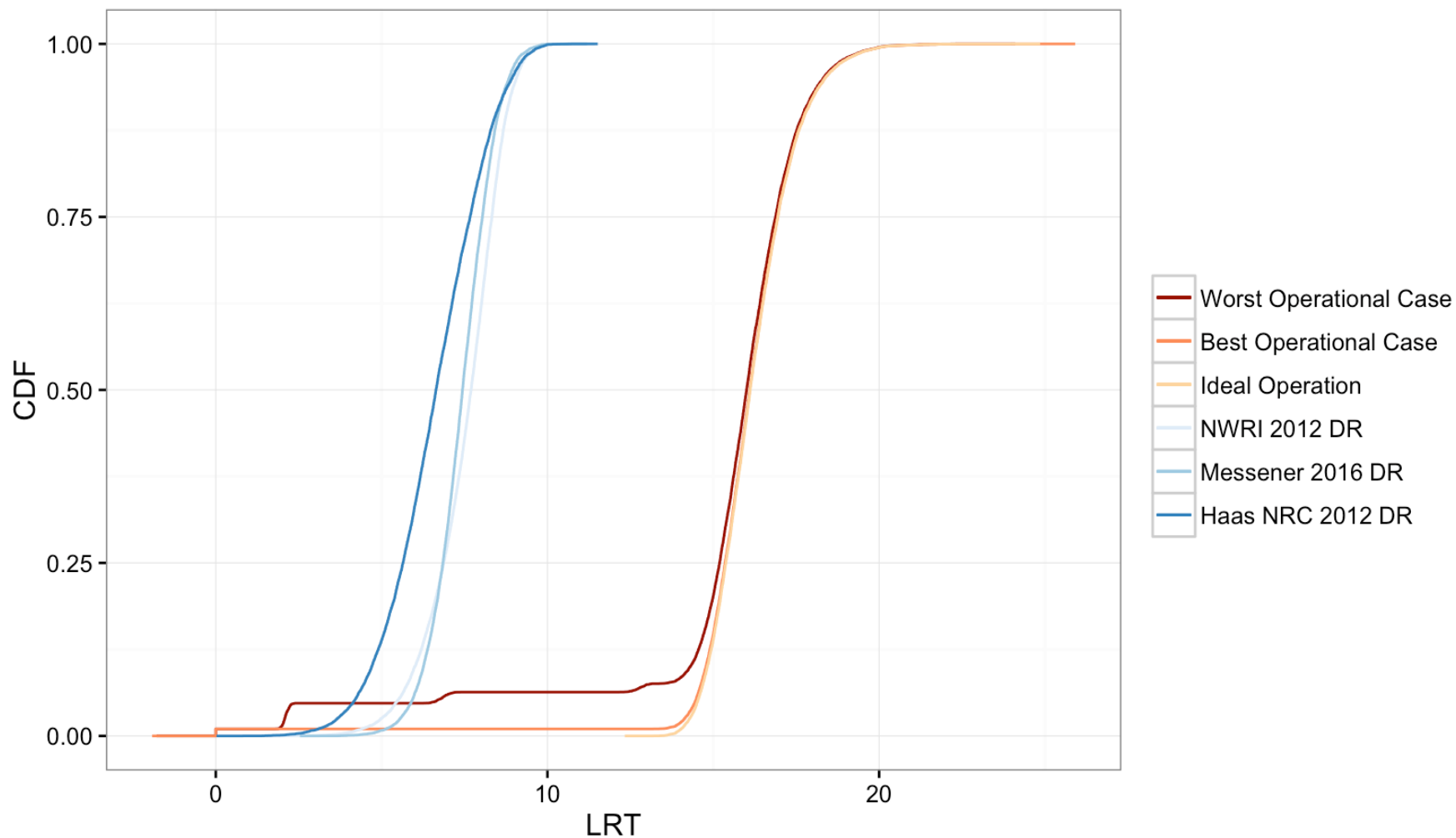
# Cumulative Density Plot – Estimated Log Removals to Meet Tolerable Risk of Infection



# Operational Analysis vs LRTargets

for *Cryptosporidium* to meet  $10^{-4}$  ppy risk of infection

EXAMPLE - DPR Treatment ( $O_3$ , BAF, MF,  $RO_{TOC}$ , UV-AOP,  $Cl_2$ )



# Update on Meeting Schedule & DPR Feasibility Report

- *Feb 23-24 (DONE) - Bioassay; Reliability; ARB/ARG; Outline*
- *March 30-31 (DONE) -Reliability; Intro. & Comparative Risk (approach)*
- April 13-14 -Chemical & Molecular (pathogen) monitoring
- May 11-12 -Prelim. Research Recommendations; Comparative Risks; Public Health Surveillance (draft notes)
- June (early) -Draft Panel Report; Public Health Surveillance (small workgroup)
- June 29-30 -Final Draft Report
- July (mid) -Final Draft to SWB DDW staff

QUESTIONS ?