



LIFT Overview and Water Reuse Opportunities

February 9, 2017



WaterReuse Webcast Series
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A Few Notes Before We Start...

- Today's webcast will be 60 minutes.
- There are no Professional Development Hours (PDHs) available for this webcast.
- A PDF of today's presentation can be downloaded when you complete the survey at the conclusion of this webcast.
- If you have questions for the presenters please send a message by typing it into the chat box located on the panel on the left side of your screen.



Speakers



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LIFT

LIFT is a WEF/WE&RF initiative to encourage and support innovation in water



LIFT Steering Committee



Dr. Charles Bott (Chair)
HRSD



**Jim McQuarrie
(Vice-Chair)**
MWRD (Denver)



Dr. John Barber
Eastman Chemical



Tom Kunetz
MWRDGC (Chicago)



Dr. Nancy Love
University of Michigan



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DC Water
**Water Environment
Federation**
the water quality people®



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GE Power and Water



Dr. Art Umble
MWH



**Dr. Mark LeChevalier
(Liaison)**
American Water



Jeff Lape (Liaison)
U.S. EPA



LIFT 101



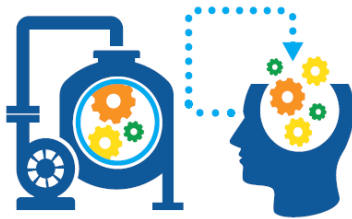
Technology Scans



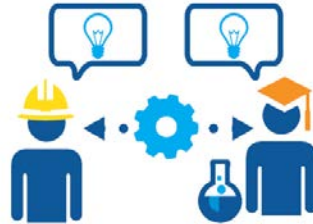
LIFT Link



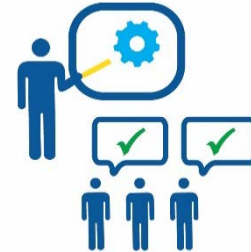
FAST Water Network



SEE IT



**University-Utility
Partnership**

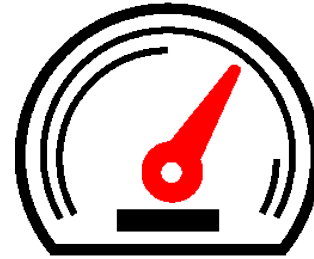


**Info Sharing and
Collaboration**

Technology Scans



Looking for innovative technologies that bring:

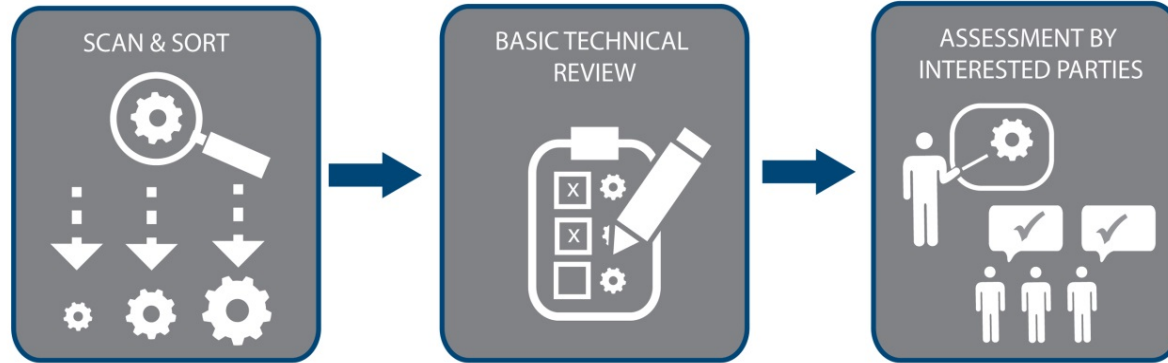


Expert panel of consultants, operators, regulators, and academics provides feedback on these criteria

Technology Scans



LIFT[®] Technology Scans 3-Step Process



LIFT

Leaders Innovation Forum
for Technology

86 Technologies
81 Companies



2017 LIFT Scan Webinar Series



<http://www.werf.org/lift/techscanpresentations>

Topic	Technologies	Date
P-Recovery	NuReSys, PEARL, and AirPrex	February 14 th
Intelligent Water Systems (Distributed)	OptiRTC, Wavelet, RT-DSS	March 7 th
Nutrients	AvN, Nereda, ABNR	April 18 th
Water Reuse/Disinfection	Reclaimed Water Pasteurization, PearlAqua	September 12 th

Other topics include: Intelligent Water Systems, Collection Systems, Decentralized Systems, and Early-Stage Technologies



Discover Collaborate Connect

<http://liftlink.werf.org>

The screenshot shows the LIFTLink website with a blue header containing the logo and navigation links for 'ABOUT', 'LOGIN', and an email icon. The main banner features a large gear icon with a magnifying glass and the word 'DISCOVER' in bold. Below this, it lists 'Research & Technology Needs | Topical Experts & Solutions' and 'New Technologies | Pilot & Demonstration Sites & Data'. A section titled 'Most Followed' encourages users to 'Check out the most followed innovative technologies.' and displays four featured articles. Each article includes a thumbnail image, a title, a brief description, and 'FOLLOW' and 'COMMENTS' buttons.

LIFTLink
Discover. Connect. Collaborate.

DISCOVER
Research & Technology Needs | Topical Experts & Solutions
| New Technologies | Pilot & Demonstration Sites & Data

Most Followed
Check out the most followed innovative technologies.

- BIOLOGICAL TO REMOTE ENERGY PRODUCTION, OTHER RESOURCES RECOVERY**
KORE Infrastructure
KORE Infrastructure's technology-based biosolids management solution revolutionizes ...
FOLLOW 0 COMMENTS 0
- CARBON DIOXIDE, PRIMARY TREATMENT**
ClearCove Systems Enhanced Primary Treatment (EPT)
ClearCove Systems
ClearCove EPT performs screening, grit removal, primary clarification, and flow equalization ...
FOLLOW 4 COMMENTS 0
- RECOVERY FROM PHOSPHORUS RECOVERY, THERMAL HYDROLYSIS**
AirPhos Phosphorus Recovery
CMF Technology Water and Biosolids Corp.
AirPhos removes phosphorus in the form of Magnesium Ammonia Phosphate (MAP or Struvite) ...
FOLLOW 4 COMMENTS 0
- BIOLOGICAL SPREADING, COMPOSTION**
CAMSII Thermal Hydrolysis (THP)
Camsii, Inc.
Camsii is the worldwide leader in thermal hydrolysis (THP), a process which produces ...
FOLLOW 2 COMMENTS 0

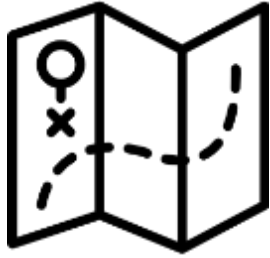
Home for the Test Bed Network



www.werf.org/testbednetwork



Activities



guidance



matchmaking

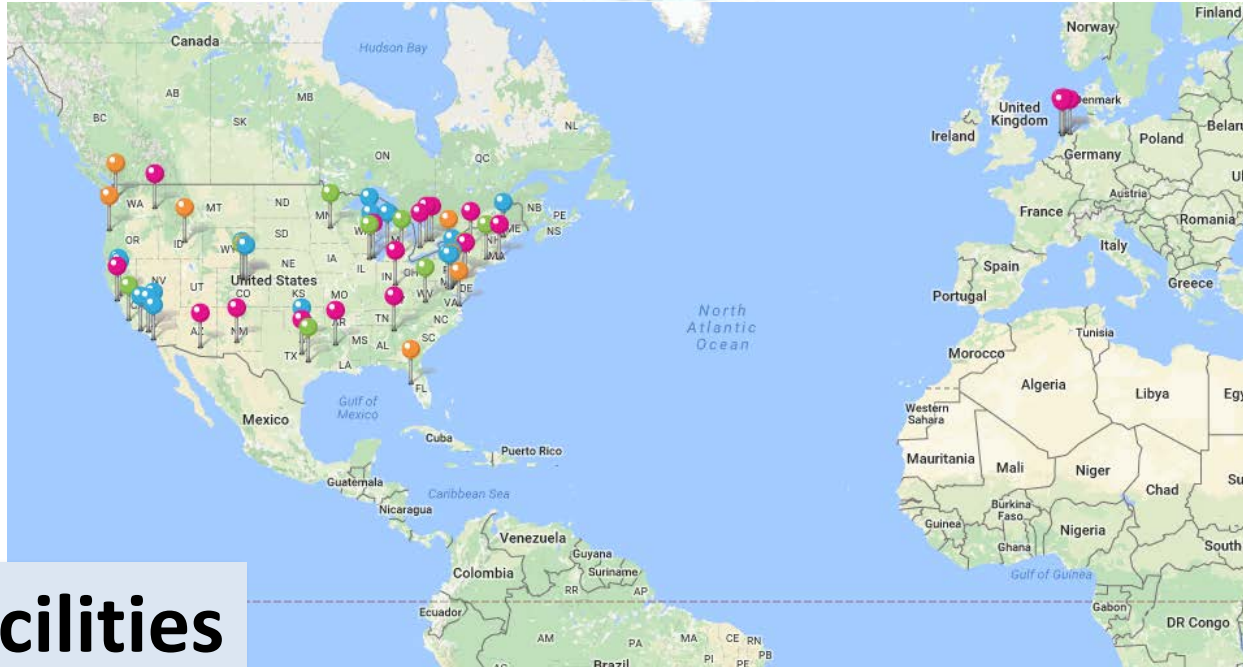


validation



data library

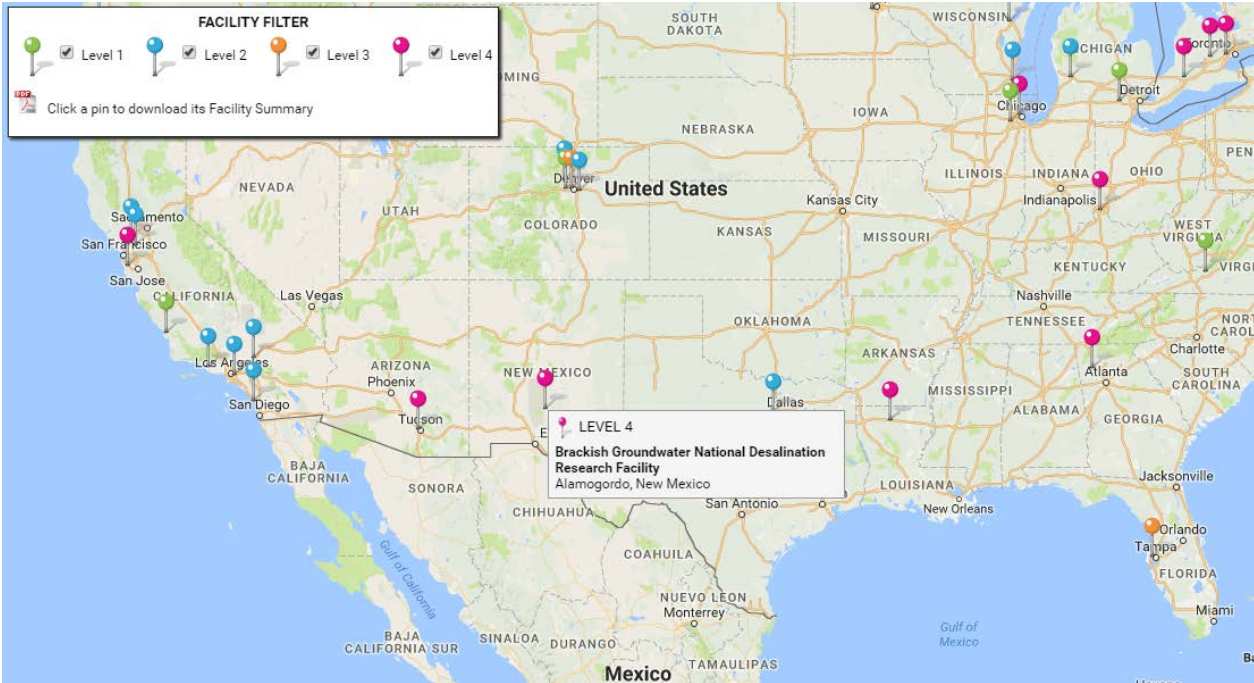
Test Bed Directory



- Level 1
- Level 2
- Level 3
- Level 4

60 Facilities

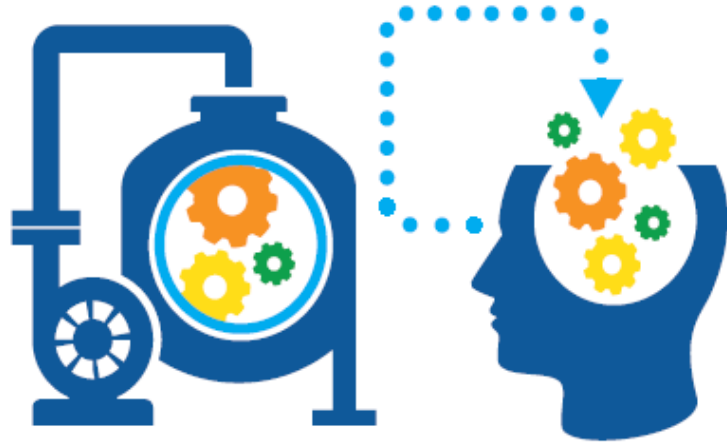
Facility Details



Brackish Groundwater National Desalination Research Facility Bureau of Reclamation

Type of Facility	Level 4: A staffed facility dedicated solely to R&D/piloting of new technologies (can be housed at a functioning WRRF)
Facility Contact	Randy Shaw, PE Facility Manager (575) 443-6553 rshaw@usbr.gov http://www.usbr.gov/research/AWT/BGNDRF/index.html
Facility Address	500 LaVelle Road Alamogordo, NM 88310 United States
Facility Partners	
Description of Test Facility	The Brackish Groundwater National Desalination Research Facility (BGNDRF) is a 43 acre complex comprised of a central research building, outdoor test pads, 5-acre agricultural research area, renewable energy test areas and 4 brackish water wells including a storage and source water delivery system. Research, development and demonstration work are conducted by a variety of organizations including universities, private sector companies, entrepreneurs, and government agencies. Facility use fees are being waived through September 2017.
The BGNDRF staff operate and maintain the facility. The Water Treatment Group in the Denver Reclamation office provide desalination technical assistance upon request. The	

LIFT SEE IT



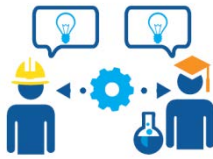
- Scholarship Exchange
Experience for Innovation and
Technology
- WEF, NACWA, WE&RF
Partnership
- \$30,000 in Travel Scholarship
Funds
- 11 Utilities Awarded in 2017

LIFT SEE IT

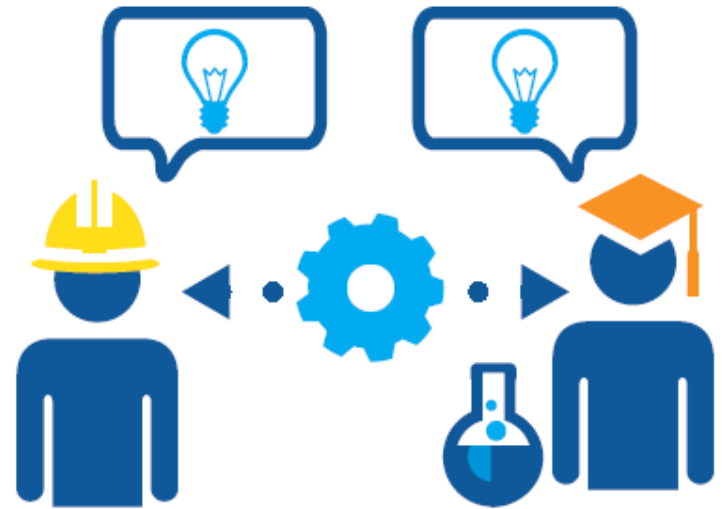


- Recipient Spotlight: Washoe County Community Services visiting HRSD
- Technology: Ozone-biological activated carbon and advanced oxidation (ultra-violet), membrane-based treatment systems, soil aquifer treatment processes and expertise to achieve potable reuse

University and Utility Partnerships



- Program to Better Connect Universities and Utilities
- Embed Students at Utilities
- Targeted RDD&D
- Workforce Training



Information Sharing and Collaboration



- Utility Working Group and Focus Groups
- Targeted Collaborative Research (TCR)
- Fostering Research & Innovation within Water Utilities
- Technology Surveys
- LIFT Technology Scan Webinars
- In-Person Meetings
 - IR² Forum 2017, Aug. 10-12, 2017, Manhattan College
- LIFT Notes e-Newsletter

Utility Technology Focus Groups



1 Biological Nutrient Removal

2 P-Recovery

3 Digestion Enhancements

4 Biosolids to Energy

5 Energy from Wastewater

6 Collection Systems

7 Green Infrastructure

8 Small Facilities

9 Odor Control

10 Disinfection

11 Water Reuse

12 Intelligent Water Systems



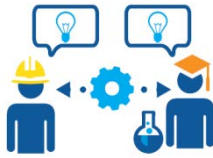
← New in 2017

Water Reuse Focus Area



- New focus area in 2017
- Focus on technologies of most interest to participants
- May include multiple subgroups
- A chair for the focus area is needed

Potential Water Reuse Subgroups



- Membrane treatment technologies
- Non-membrane treatment technologies
- Concentrate Management

Additional coordination with ongoing research

Collaborations for RDD&D



Utilities

Universities

Consultants

NGOs

Others

Federal
Agencies

Financers

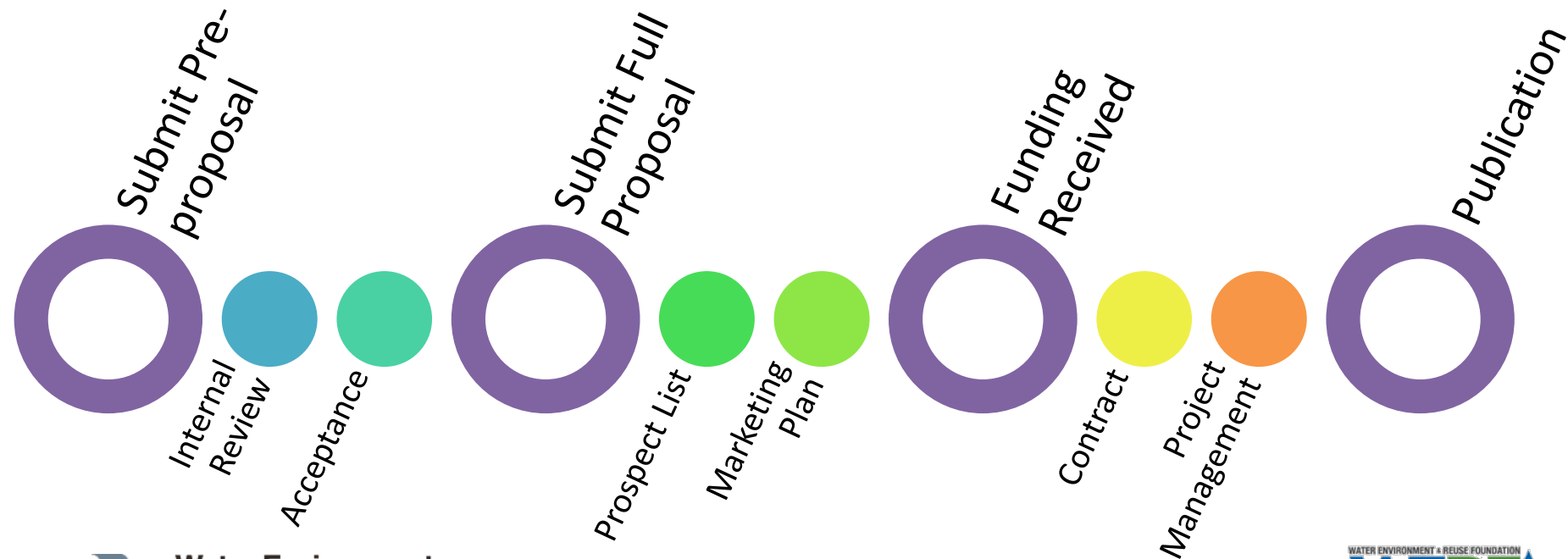
Technology
Providers



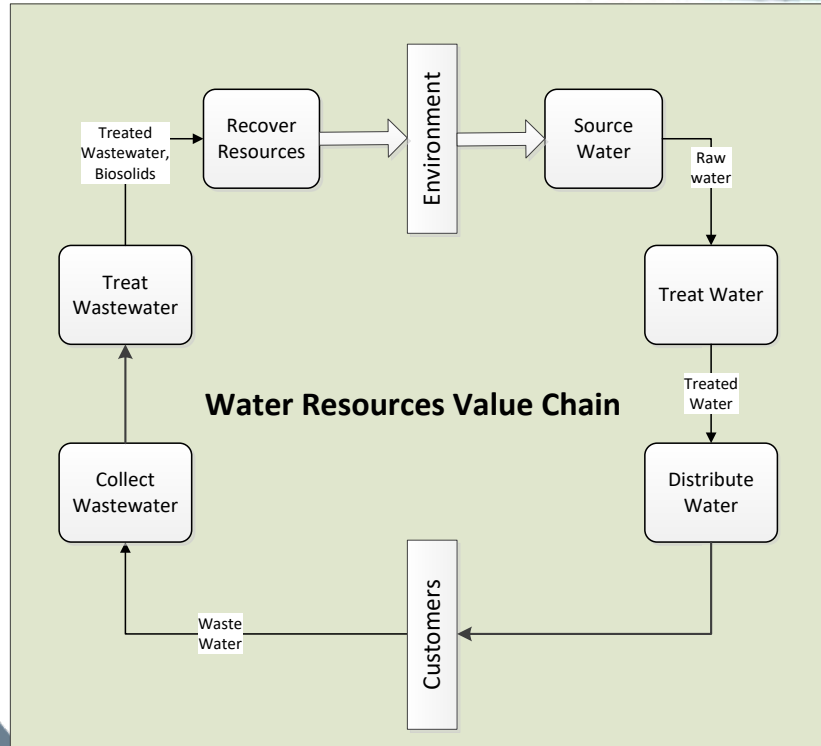
Example Collaboration – Hydrothermal Processing Technology



Tailored Collaborative Research Process



LIFT for Utility Management



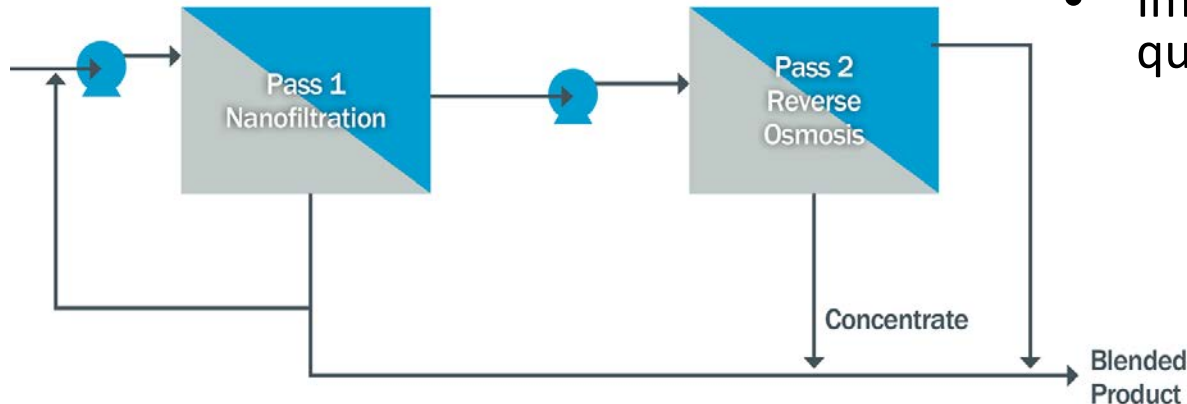
Utility Steering Committee

San Francisco PUC
DC Water
Clean Water Services
Toho Water Authority
Hampton Roads VA
Charlotte NC
Orange County FL
MCES (Minneapolis/St. Paul)
King County WA
Alexandria Renew
Louisville and Jefferson County
Grand Rapids
Avon Lake Water District

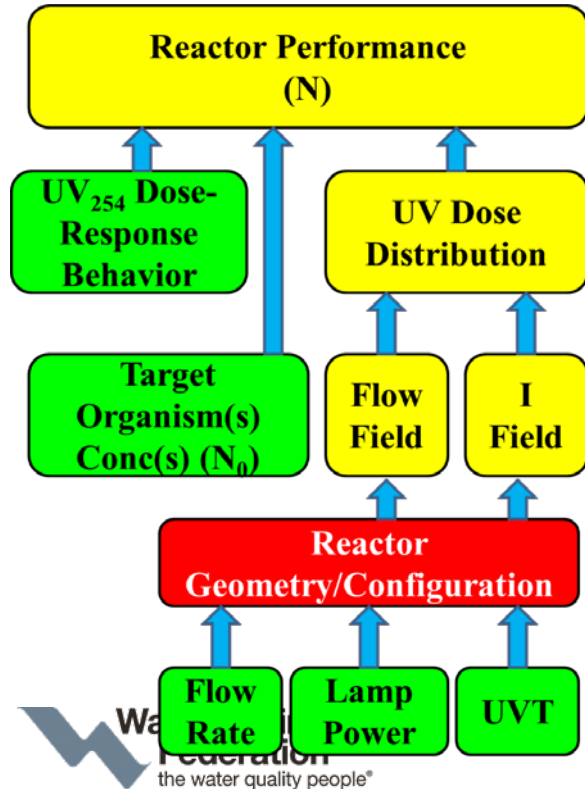
NF/RO Pilot Project



- Pilot using nanofiltration before RO unit to separate beneficial ions
- Brine reduction and lower energy costs
- Improved finished water quality



Design and Validation Protocol for UV Disinfection Systems Phase 2



Results from Phase I of this project have suggested that system designs developed by conventional methods may lead to over-design by a factor of 2 or more.

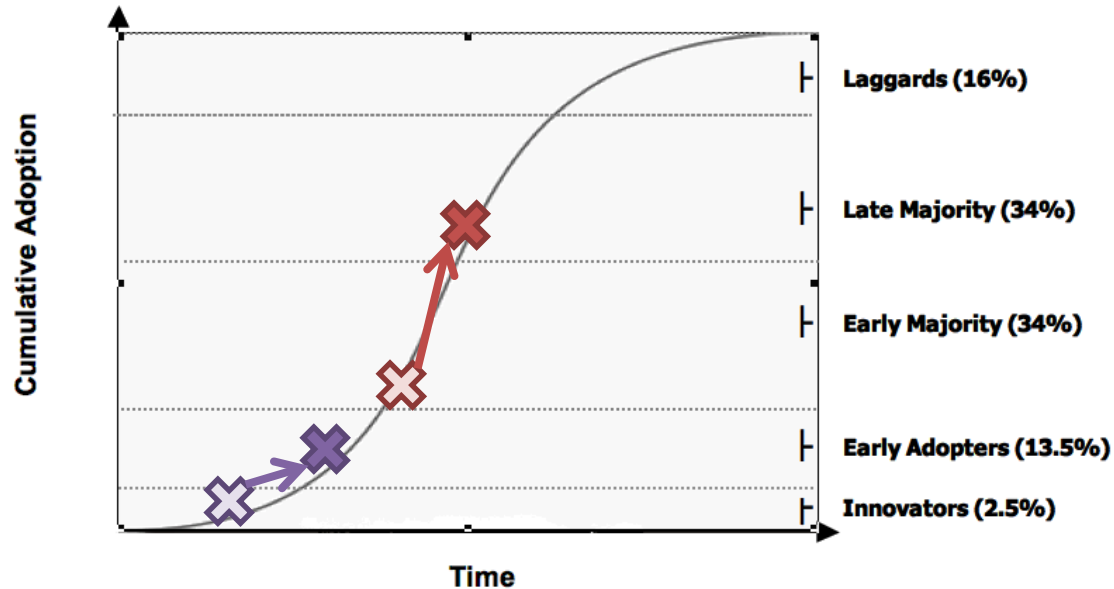
- *Apply the stochastic CFD-I tool to other wastewater treatment applications*
 - Other UV reactor types (lamp configurations)
 - Other endpoints of disinfection
- *Apply LA for measurement of dose distribution across a range of operating conditions*
 - Apply to new reactor configurations
 - Expand range of operating conditions (reuse)
 - Cross-validate with CFD-I and biodosimetry results
- *Evaluate responses of ambient viruses (phage) to UV irradiation*
 - Behavior of ambient coliphage
 - Concentrations in undisinfected effluents (N_0)
 - Variability in UV dose-response behavior
 - Identification of specific phage that are present in wastewater effluents
 - Relationship between the behavior of these phage and the behavior of human (pathogenic) viruses
- *Regulatory Guidance*

2017 Water Technology Survey



<http://www.surveymzmo.com/s3/2952785/LIFT-Water-Tech-Survey-2016>

- Understand industry priorities and connect interested parties
- Summary data to be publically available early Spring 2017
- 90 responses received to date



2017 Water Technology Survey



36. Tell us about your organization's interest in the following water reuse technologies or processes.

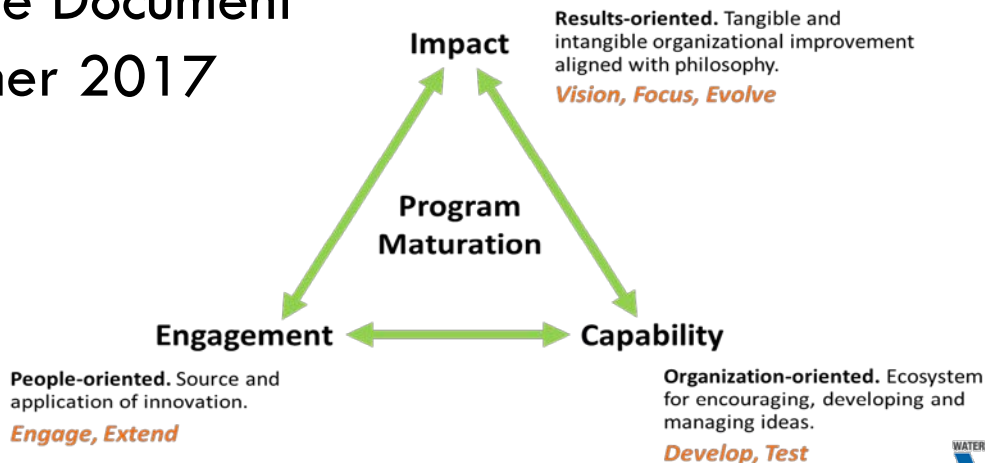
	Already Installed	Interested in installing in the next 2 years	Interested in installing in the next 5 years	Interested in installing in the next 10 years	Interested, but unsure of timing	Not interested/Not Applicable
Direct potable reuse Count	1	0	4	1	15	8
Indirect potable reuse Count	14	0	2	1	9	2
Fit-for-purpose reuse Count	10	2	2	1	7	7
Biological activated carbon Count	2	1	3	0	11	11
Granular activated carbon Count	5	1	3	0	9	10
Ozone-biologically active filtration Count	1	1	2	0	13	11
Concentrate treatment Count	1	1	2	1	11	12
Forward osmosis Count	0	1	0	2	10	15
Membrane bioreactors (MBRs) Count	5	0	2	2	8	12
Microfiltration/ultrafiltration Count	5	0	5	1	12	5
Nanofiltration Count	0	0	5	1	8	14
Nitrate control Count	6	1	0	0	10	12
Ozonation Count	2	2	2	2	9	11
Soil aquifer treatment Count	6	1	1	1	4	15
Reverse osmosis Count	2	1	2	3	10	11

Fostering Innovation within Utilities

Project LIFT11C15



- ✓ Conducted Global Utility Surveys
- ✓ Defined Key Attributes of Innovative Utilities
- ✓ Developing Self Assessment Tool
- ✓ Developing Guidance Document
- ✓ Final Products: Summer 2017



Questions / Discussion



www.werf.org/lift



Thank You

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