



REIMAGINING THE

# Cadillac Desert

THURSDAY, SEPT. 15, 2016

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BEST BEST & KRIEGER LLP

## INNOVATION@AWK

**Paul Gagliardo**

*American Water's Innovation Program*

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## American Water History and Operations

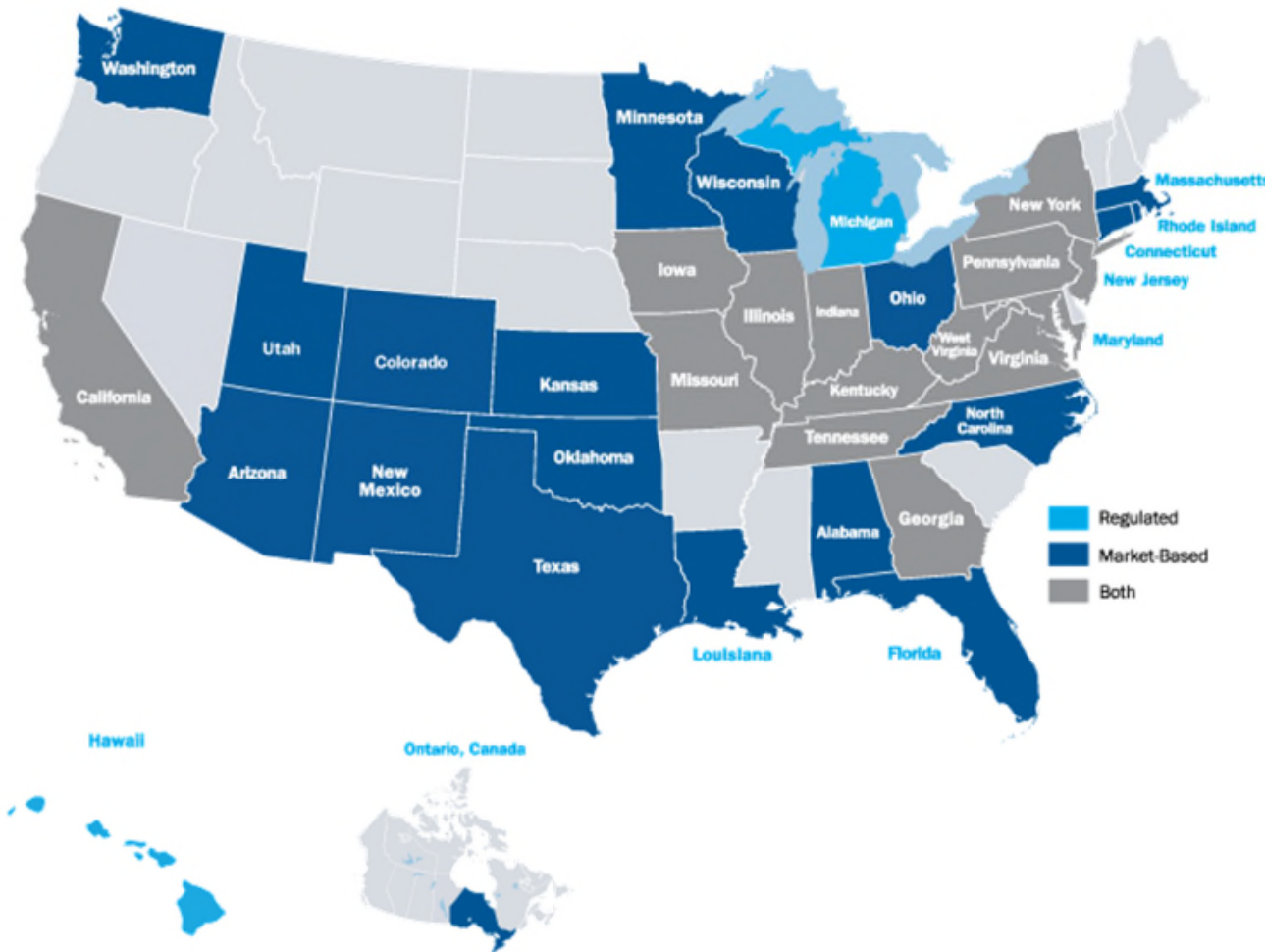
American Water is the largest water and wastewater services provider in North America, headquartered in Voorhees, NJ.

American Water provide services to approximately 15 million people in more than 1,600 communities in more than 45 states and in Canada; and employs about 6,500 water professionals.

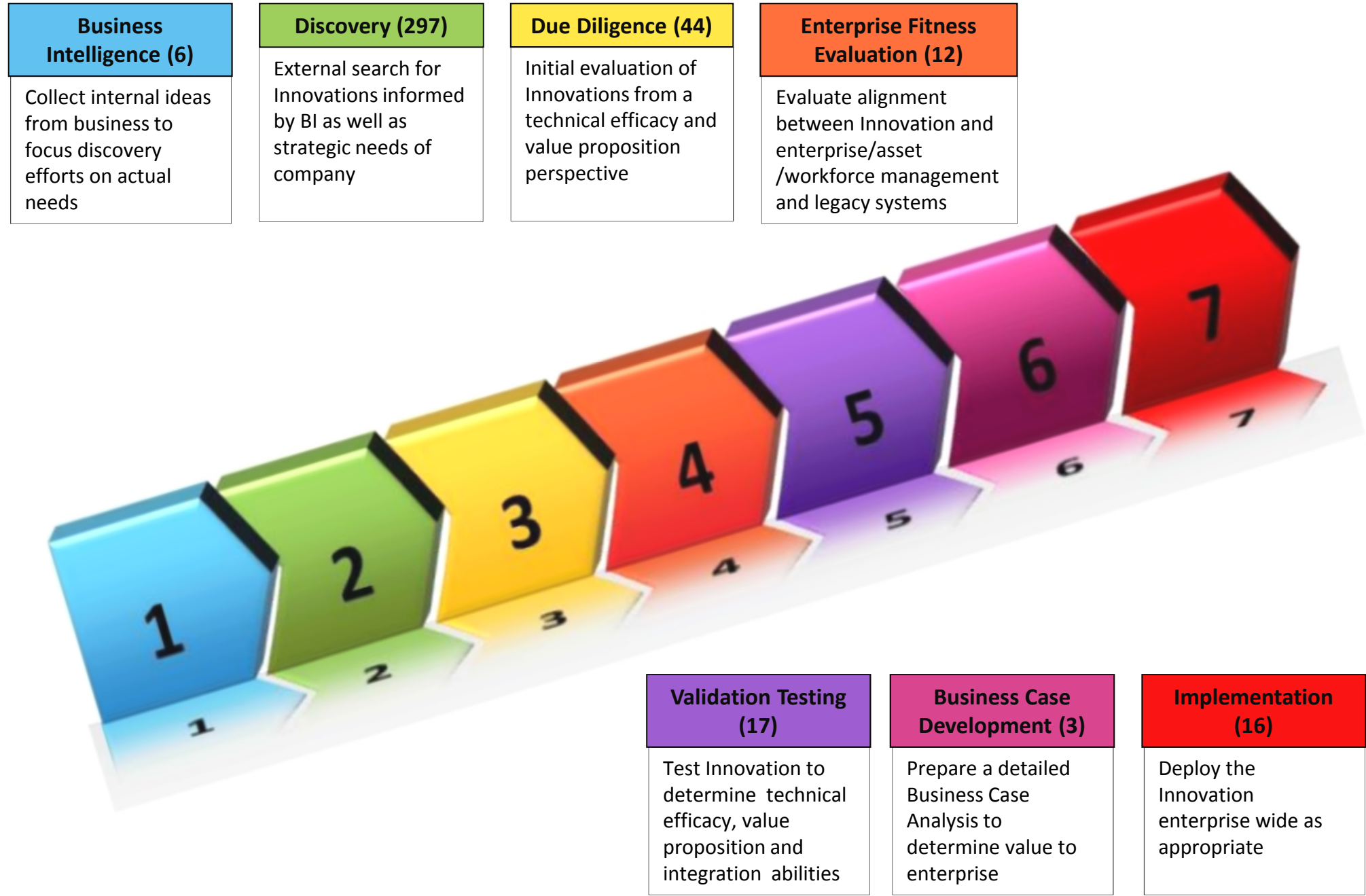
American Water owns or operates over 300 drinking water systems, 200 wastewater facilities and 46,000 miles of transmission and distribution mains.

We treat and deliver over a billion gallons of water daily

The company conducts over one million water quality tests each year for over 100 regulated parameters, and up to 50 types of water-related tests each day.



# 7 Step Innovation Process



# Smart Metering Systems



- Consolidation of data from 3.1 million water meters
- Commoditization of meters
- Reduction in acquisition costs
- Data analytics for stopped meters, continuous running meters, backflow
- Integrated customer service
- Improved customer interface

# New Pipe Formulations

- Korean PPI PYUNGWHA CO., LTD.
- Ductile Iron strength
- Corrosion resistance of PVC



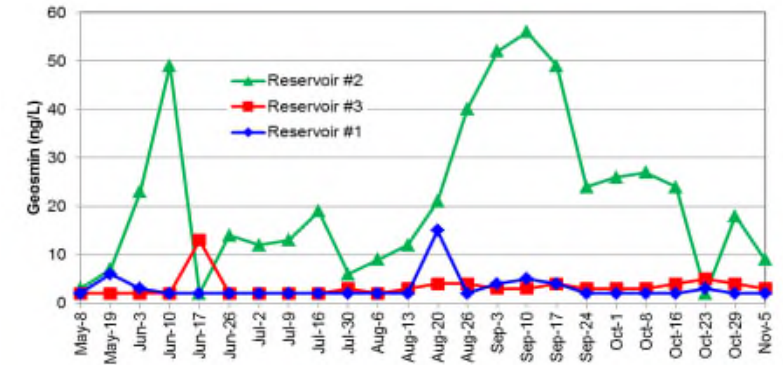
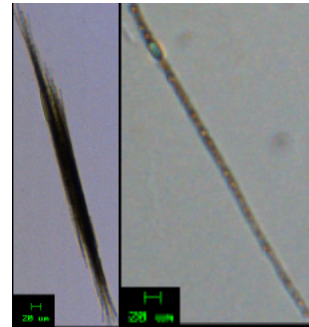
Tests	AWWA Requirements	iPVC
Impact Load (for 10" pipe)	100 foot-pounds	390 foot-pounds *
Tensile Strength at 73° F	7,000 psi	7,780 psi
Modulus of Elasticity	400,000 psi (Cell 5) 440,000 psi (Cell 6)	485,000 psi
Long Term Pressure	500 psi	500 psi
Hydrostatic proof test pressure (235 psi pipe)	600 psi	755 psi
Weight (pounds/foot) – 8" SDR 14	11.5	10.6



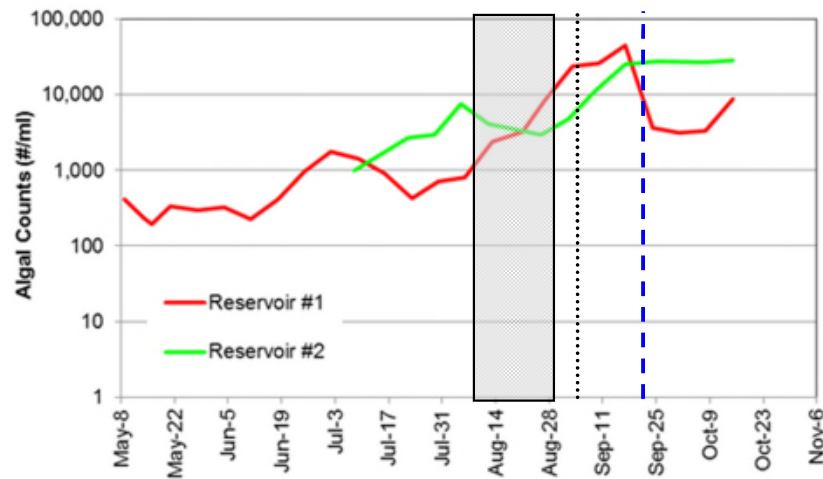
# Algae Control

Installed four LG Sonic MPC buoys in Reservoir #1 May 2014

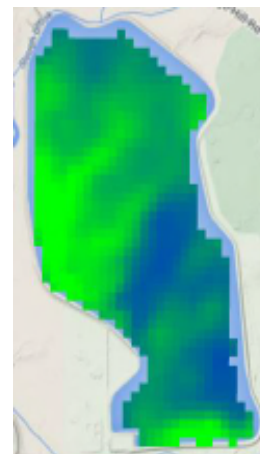
- Solar powered buoys have on-board monitors to measure algal pigments, DO, pH, Redox, turbidity
- Adjustable ultrasonic frequency to target different algae



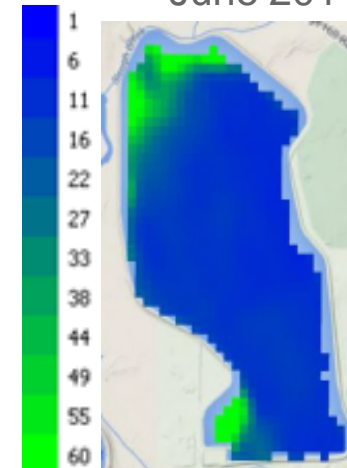
- ✓ OPEX savings of \$87,800.
- ✓ The Four LG buoys cost \$160,000
- ✓ Simple payback of 1.8 years



June 2013



June 2014



# Source Water Awareness

## WV STATE

### WV BPH

- Zones of critical concern
- Potential sources of contamination
- Public water supply infrastructure

### WV DEP

- Above ground storage tanks
- Industrial multi-sector permits
- Oil and gas permits
- Mining permits
- Hazardous waste permits
- MS4 infrastructure

### WV DOT

- Transportation infrastructure
- Emergency Response Resources

### WVOD

- Businesses

### WVGES

- Aerial imagery



## PRIVATE

### WVU

- Aerial imagery, Digital elevation model, Parcels

### Microsoft

- Aerial imagery

### Water utilities

- Potential sources of contamination
- Public water supply infrastructure

### Various

- MSDS

## FEDERAL

### USGS

- National Hydrography Dataset (NHD)
- Aerial imagery
- Topography and elevation models
- Landcover, geology and soils

### EPA

- RCRA, TRI, NPDES, CERCLIS, IRIS, OIL, PCS-ICIS, Water treatability

### DHHS

- ATSDR

### Census Bureau

- Administrative boundaries
- Demographics

### DOI

- Federal lands and facilities

### FEMA

- Floodplains and flood hazard areas

### NLM

- TOXNET

### NOAA

- CAMEO

## Energy Efficient Wastewater Treatment

- NPXpress is a unique nitrogen and phosphorous removal wastewater treatment that has been patented by American Water
- Significantly reduces the energy requirements to treat wastewater
- Reduce/eliminate the amount of additional carbon required for denitrification
- Reduces chemical requirements for phosphorous removal
- Testing ongoing at 7 sites. Projected <2 year payback
- Initial 6 sites in NJ averaging 35% energy reduction, over \$400,000 in accumulated savings over a three year period - \$0.57/m<sup>3</sup> operational cost savings

