

Right as Rain

Advancing Safe, Sustainable Water Reuse



Metropolitan Planning Council
and Openlands

Roundtable Discussion
December 16, 2010

What is "Water Harvesting"?

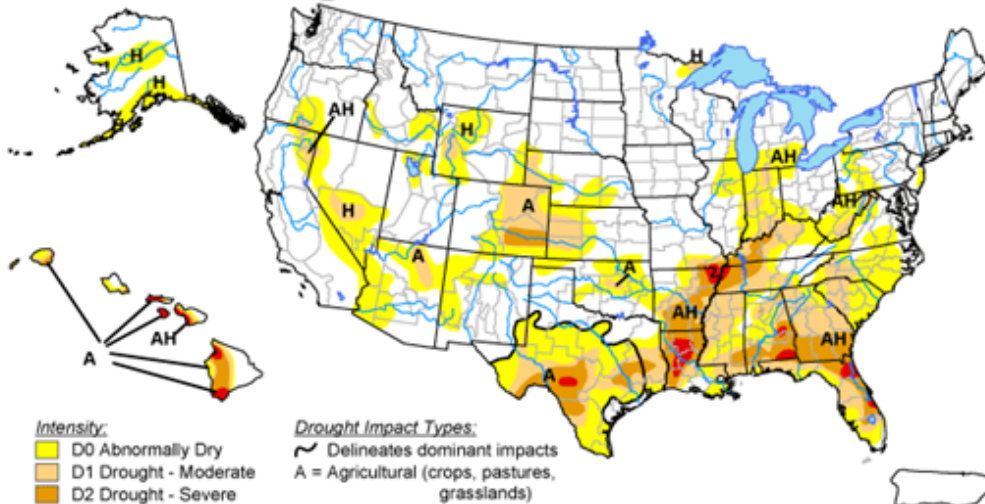
Water Harvesting is the collection, cleaning, storage and reuse of rainwater, stormwater, greywater and other sources, to replace or reduce the consumption of municipal potable water.

TERMS

Rainwater	From roofs and above-ground collectors
Stormwater	From ground surfaces – Parking lots, run-off
Greywater, Gray Water	Untreated waste water “gently used” in showers, sinks, processes
Groundwater	From below-grade sumps (around basements)
Reclaimed Water	Municipally-treated sewage for reuse
On-Site Treated Non-Potable Water	Processed water from any source ready for non-potable reuse

Potable Water Conservation Concerns

U.S. Drought Monitor November 30, 2010 Valid 7 a.m. EST



Intensity:
D0 Abnormally Dry
D1 Drought - Moderate
D2 Drought - Severe
D3 Drought - Extreme
D4 Drought - Exceptional

Drought Impact Types:
Delineates dominant impacts
A = Agricultural (crops, pastures, grasslands)
H = Hydrological (water)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>



Released Thursday, December 2, 2010
Author: Rich Tinker, NOAA/NWS/NCEP/CPC

“Water promises to be to the 21st century what oil was to the 20th.” *Fortune Magazine*

“Study Finds Water Crisis on the Horizon – Forecasts Grim for Southwest, Plains”

Reuters - July 25, 2010

“Council of Great Lakes Governors to protect Great Lakes water resource”

Water Harvesting is On-Trend!

Predicted Shortage of Fresh, Potable Water

Growing Interest in Sustainable Building Practices

Growing Concerns Regarding Stormwater Management and the Environment

Regulatory Compliance and Incentives



Why Harvest Water?

- Save money on municipal water and sewer charges
- Retain and utilize stormwater
- Protect the environment, save energy



- “Green” building certification
- Regulatory requirements, incentives
- Higher resale
- Good public relations

LEED Certification is a Trend Driver

10 or more LEED points available!

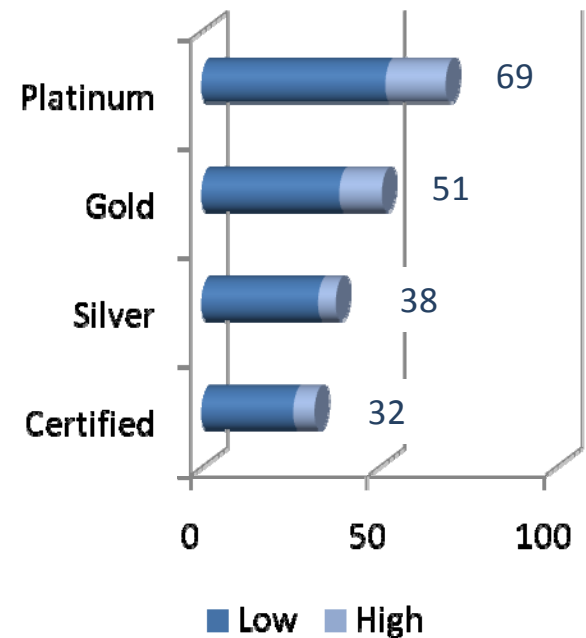
Water Use Reduction (2-4 pts)

Innovative Wastewater Technologies (2 Pts)

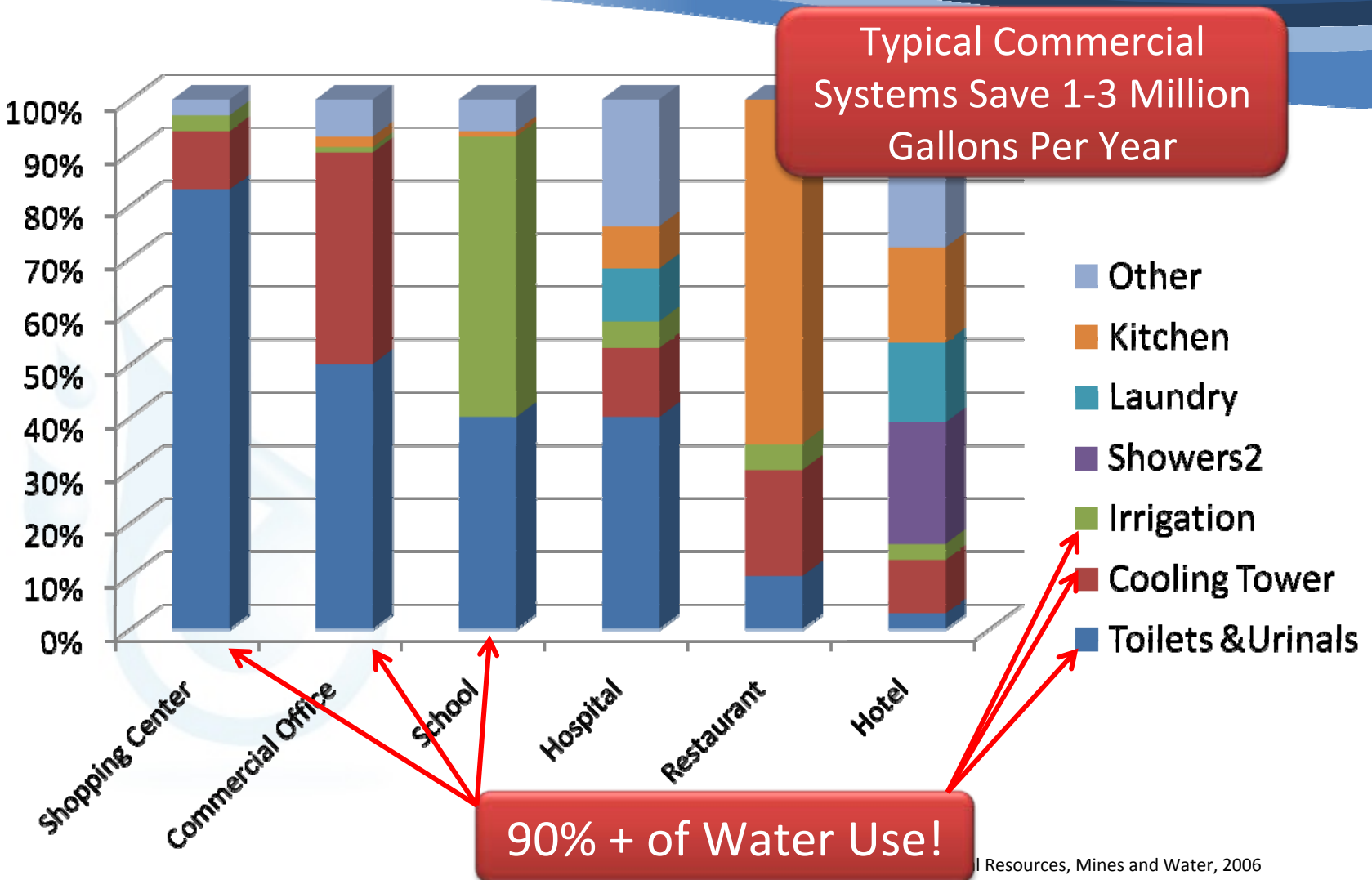
Water-Efficient Landscaping (2-4* Pts)

Stormwater Design (2 Pts)

LEED Certification Levels



Most Water Use in Public Buildings can be Replaced with Harvested Rainwater and Stormwater



Water Harvesting is Good Business

- **Architects, Engineers and System Designers**
- **Manufacturers**
 - Piping, tanks, filters, sterilizers, controls
 - System fabricators
- **Plumbing Trade**
 - Additional plumbing supply runs, waste runs
 - System installations and service
- **Electrical Trade**
 - Power supplies to systems

Industry Challenges

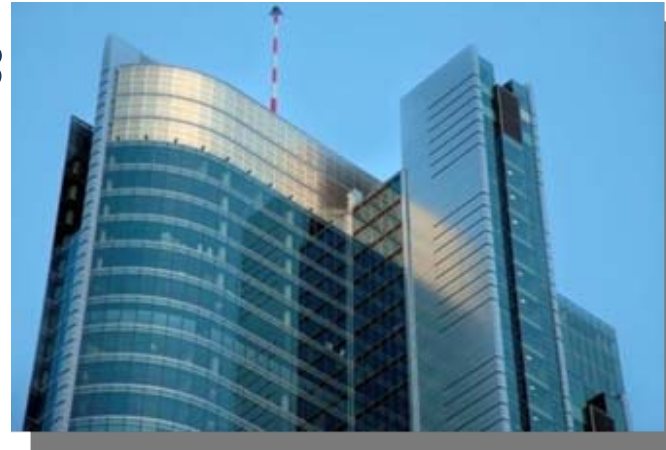
- Inconsistent and restrictive codes across communities and states
 - Good intentions but standing code that is outdated
- Inconsistent terminology
 - Misunderstandings and undue restrictions
- Emerging national guidelines from plumbing and building associations
 - Still a lack of consensus on sanitation, particulates
 - Many details still left to municipalities
- New industry with untested system approaches
 - High relative costs

Most Collection & Reuse Must Be Integrated into Building Design

2011



2013



2050?

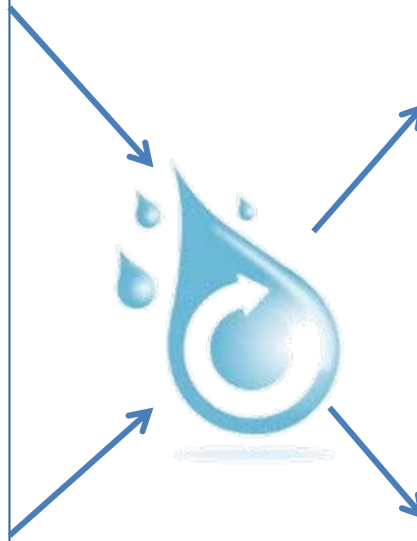
Typical Water Savings Using Harvested Water to Flush Toilets

- *Annually: 500,000 gallons*
- *Building Life Savings: 20 million gallons! (40 Years)*

Efficient Systems Tap Multiple Water Sources for Multiple Applications

Potential Sources

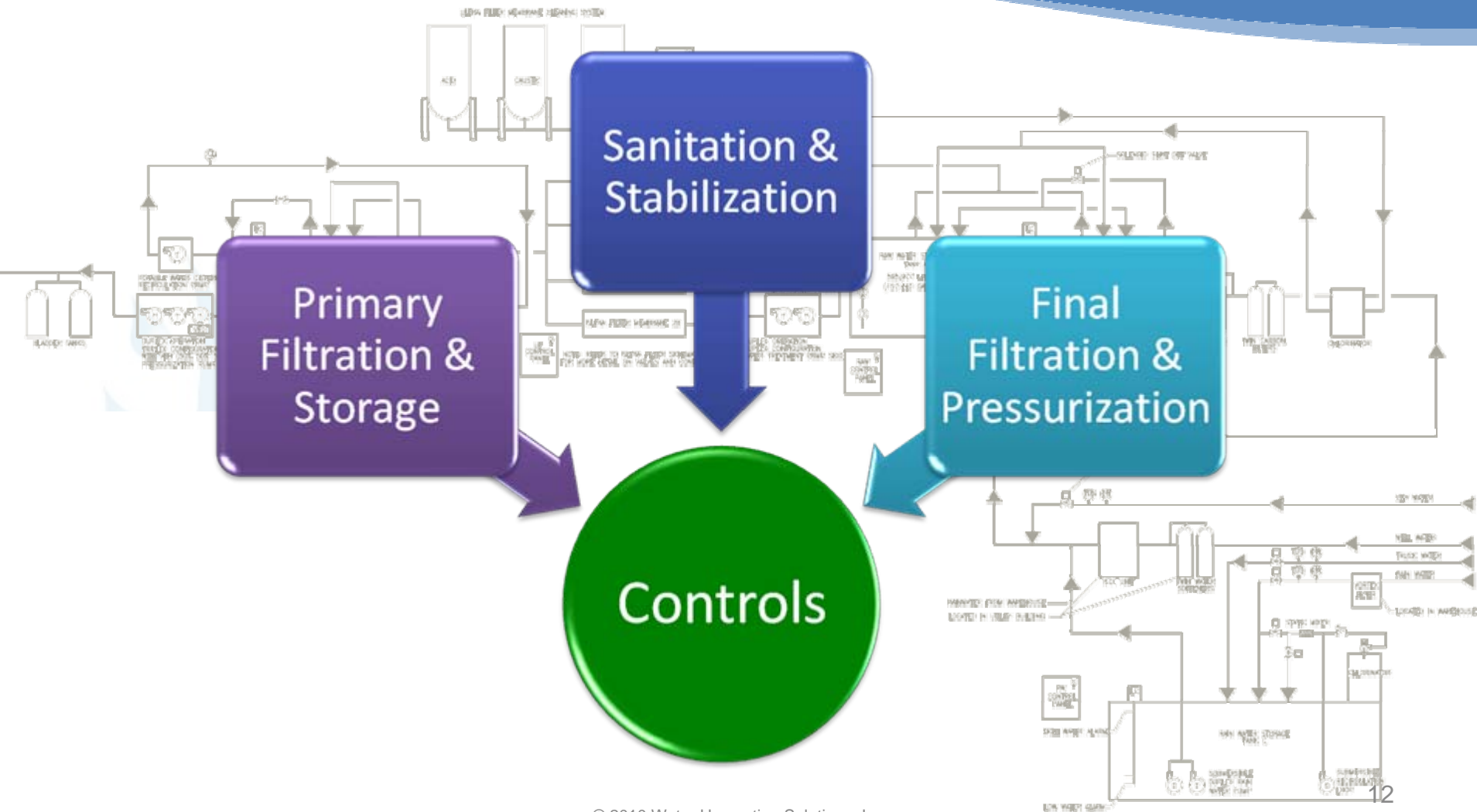
- Rooftop rainwater
- Surface stormwater
- Greywater from showers, sinks, washers
- Cooling condensate
- Steam condensate
- Groundwater ejectors
- Cooling tower “blow down”
- Process wastewater



Potential Uses

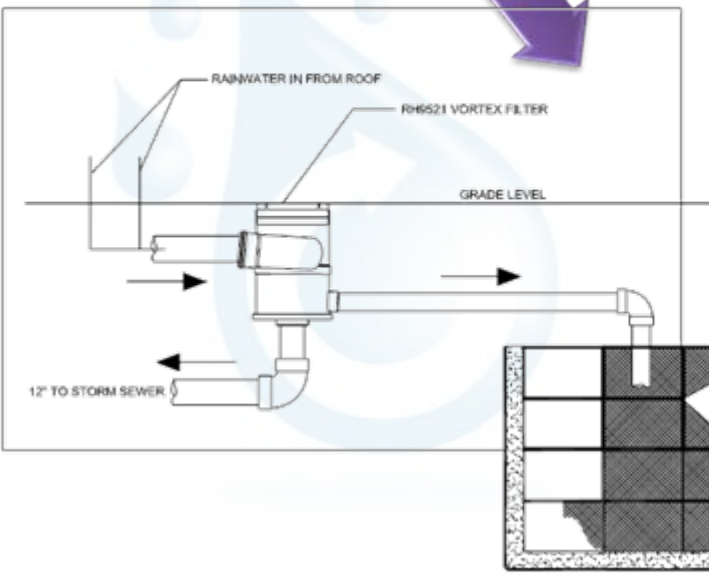
- Landscape irrigation
- Toilet flushing
- Cooling tower “make-up”
- Green roof irrigation
- Boiler “make-up”
- Truck washing
- Washing machines

System Components Must Match the Requirements of Each Site



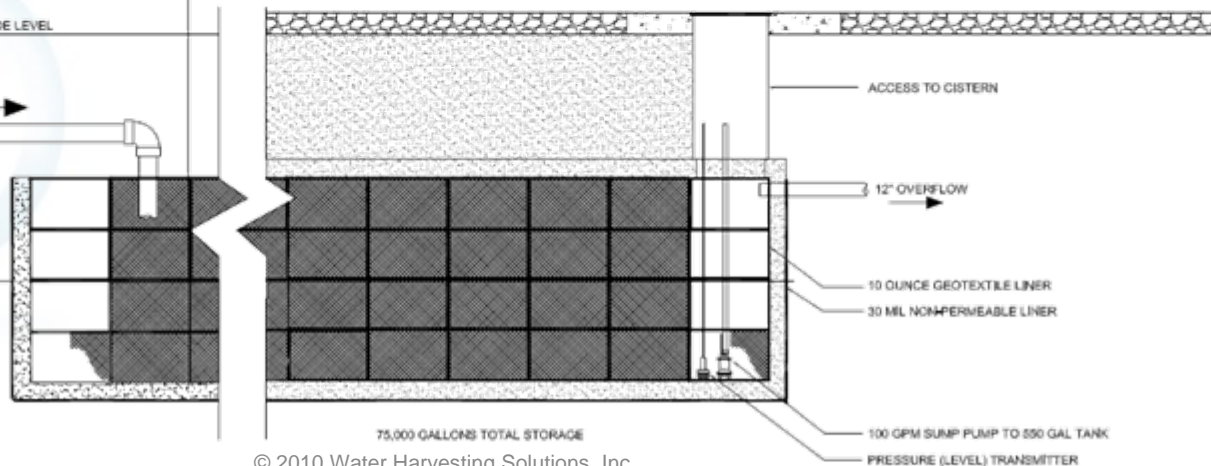
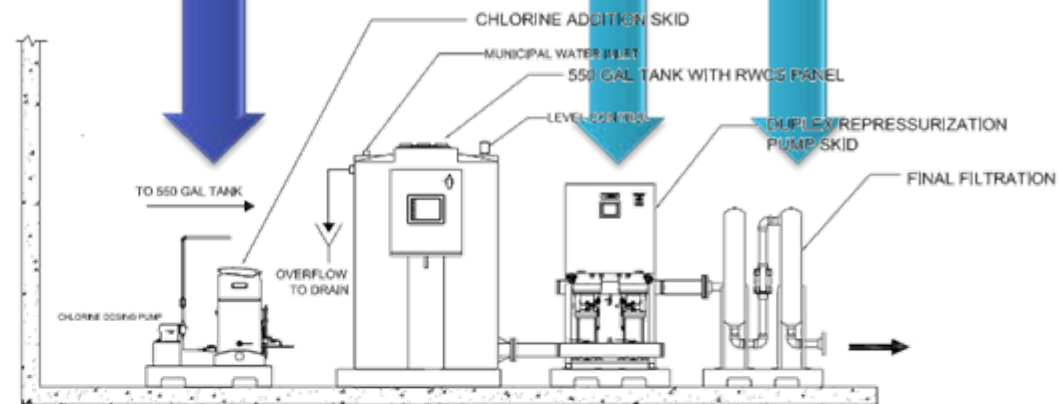
Typical System Design

Primary Filtration & Storage



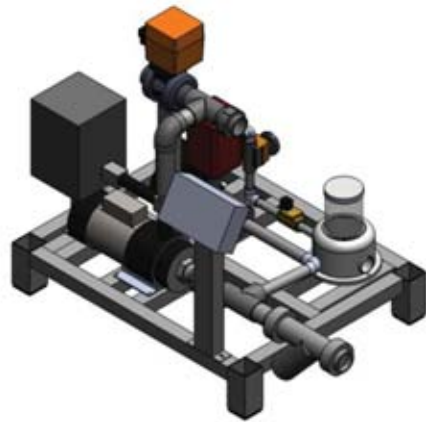
Sanitation & Stabilization

Final Filtration & Pressurization



Harvesting Systems – From Simple to Complex Commercial Grade

Simple Greywater & Rainwater Packages for Homeowners



\$2,500-\$15,000



Commercial-Grade Systems are Custom-Tailored to Each Property

\$50,000-130,000+