This presentation premiered at WaterSmart Innovations

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“The Cost of Capacity”

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Aichele

IKE + LEE


END OF EARTH 2

In Irish,
“Troy” means
“Water”

The Cost of Water and Sewer (per 100 Gallons)

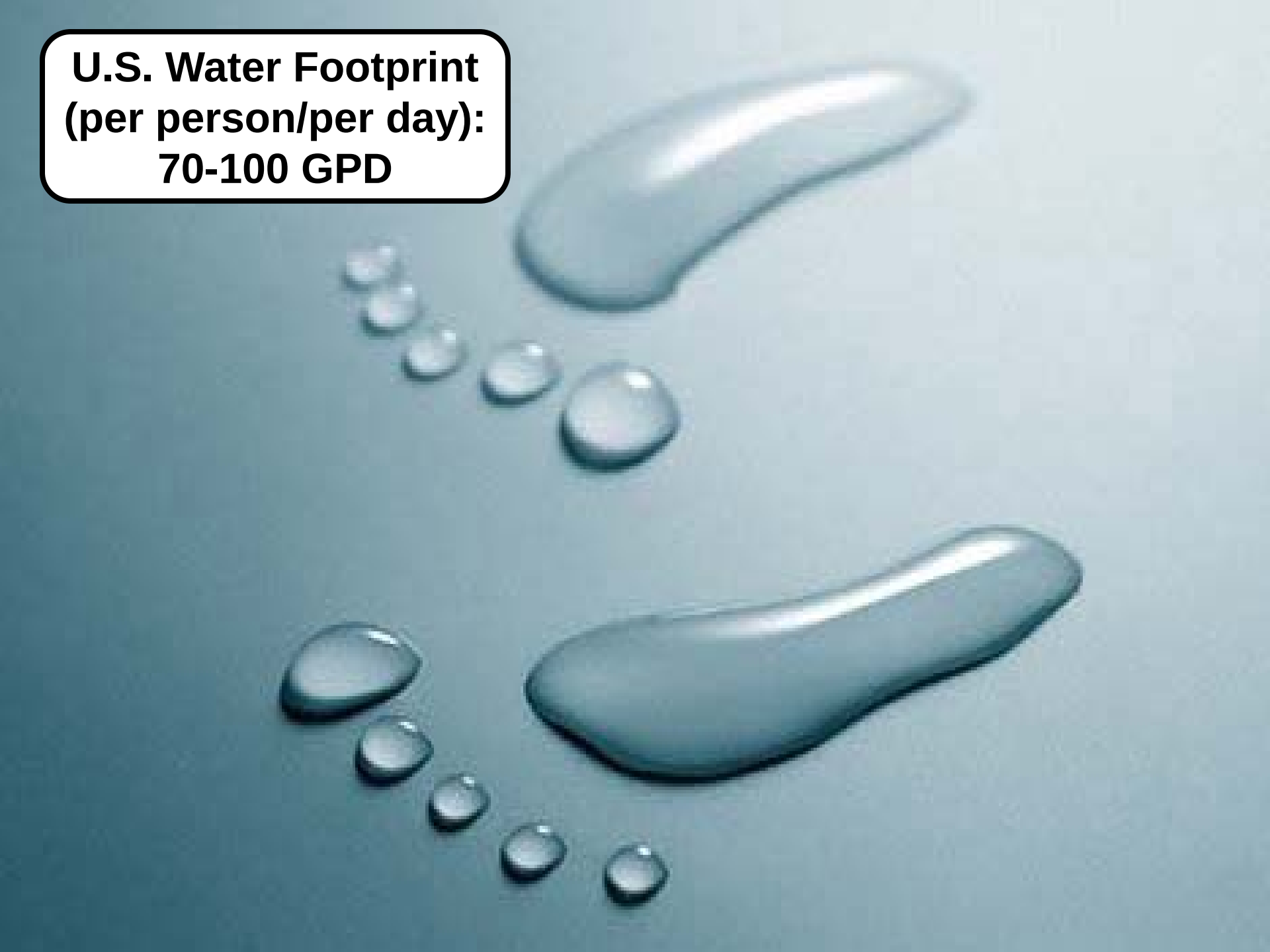
- Olympia, WA: $1.00
- El Paso, TX: $0.60
- Boston, MA: $1.05
- San Diego, CA: $1.38
- Geneva, Switzerland: $1.95
- Glasgow, UK: $2.86

Source: “The World’s Water 2008-2009” by Peter H. Gleick

U.S. / World Population

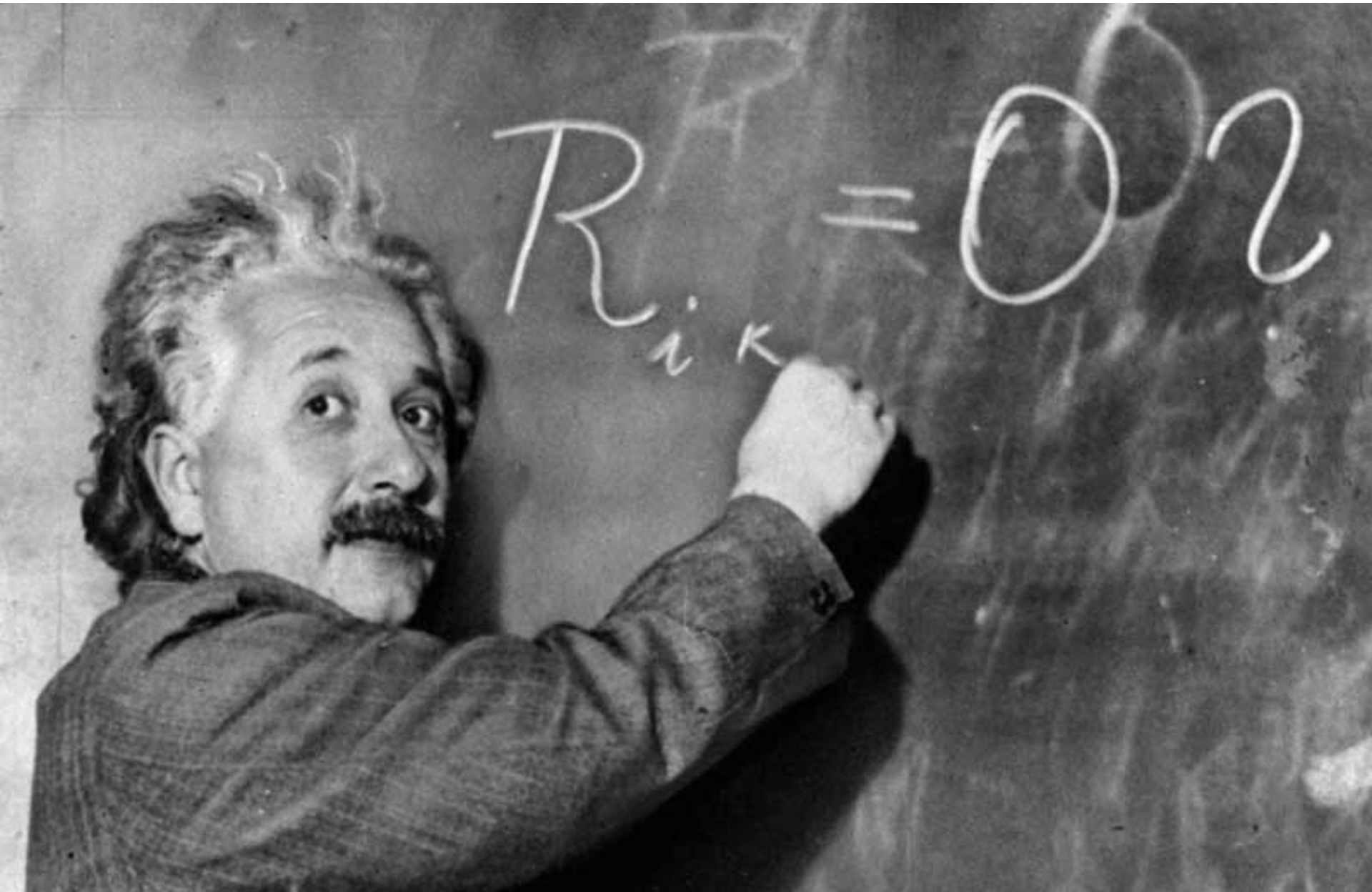
1960: 179 Million / 3.04 Billion

2010: 308 Million / 6.80 Billion

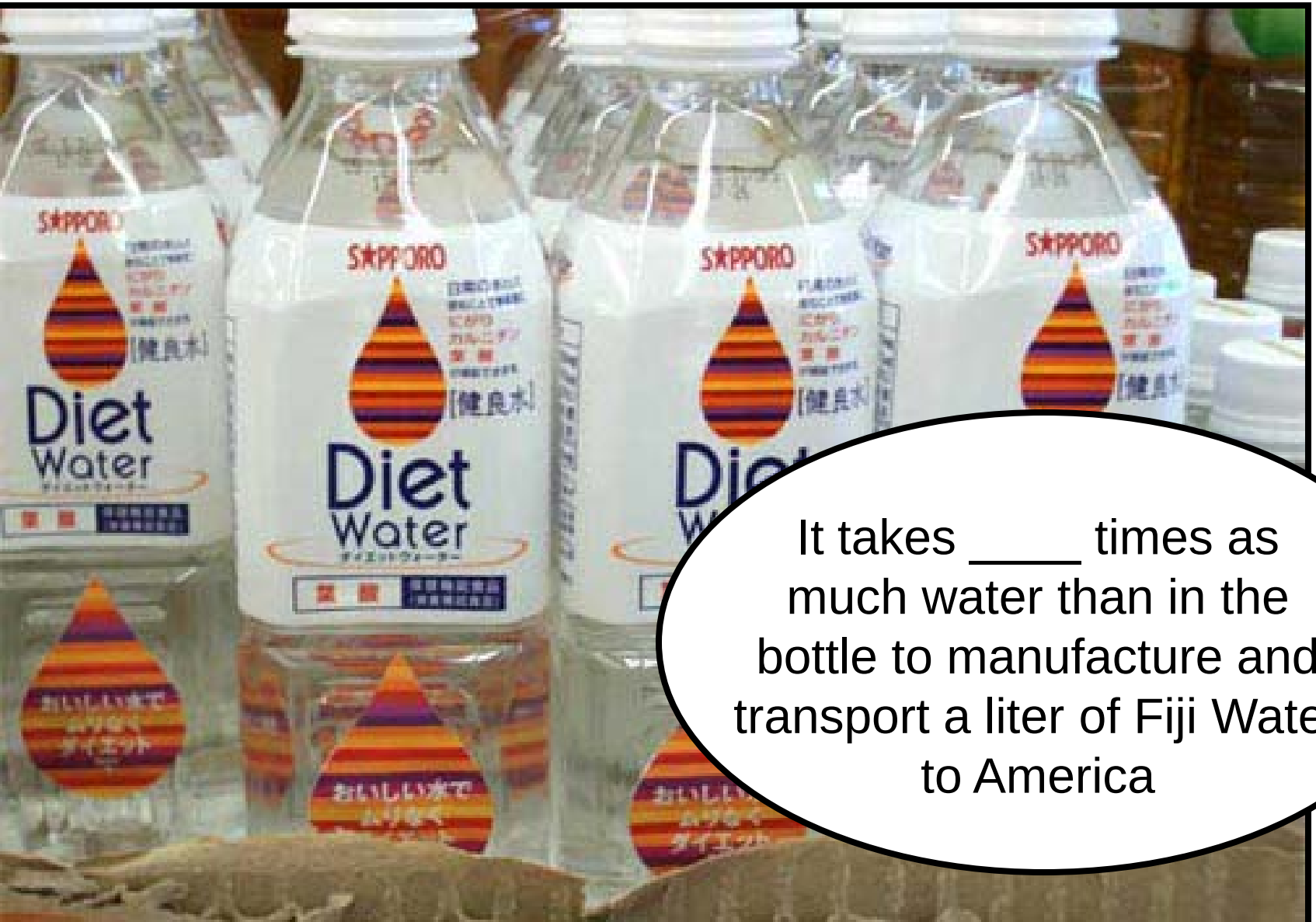

U.S. Water Footprint
(per person/per day):
70-100 GPD

The Cost of Capacity

How is Cost of Capacity Calculated?

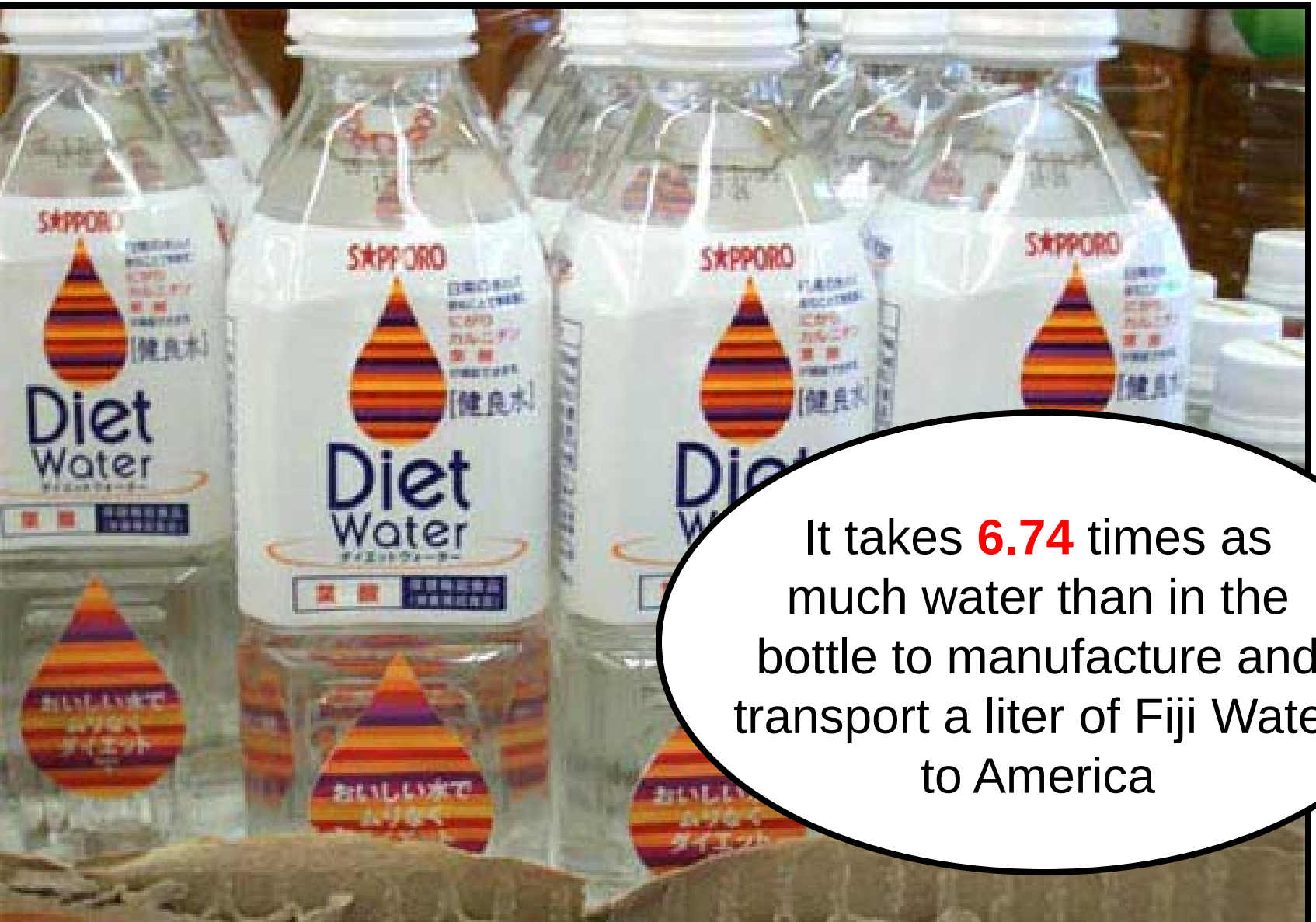


WATER FODDER



It takes ____ times as much water than in the bottle to manufacture and transport a liter of Fiji Water to America

WATER FODDER



It takes **6.74** times as much water than in the bottle to manufacture and transport a liter of Fiji Water to America

Cost of Creating:

- New Water Capacity
- New Water Treatment Capacity
- New Nega-Gallon / Conservation Capacity

Calculation Parameters

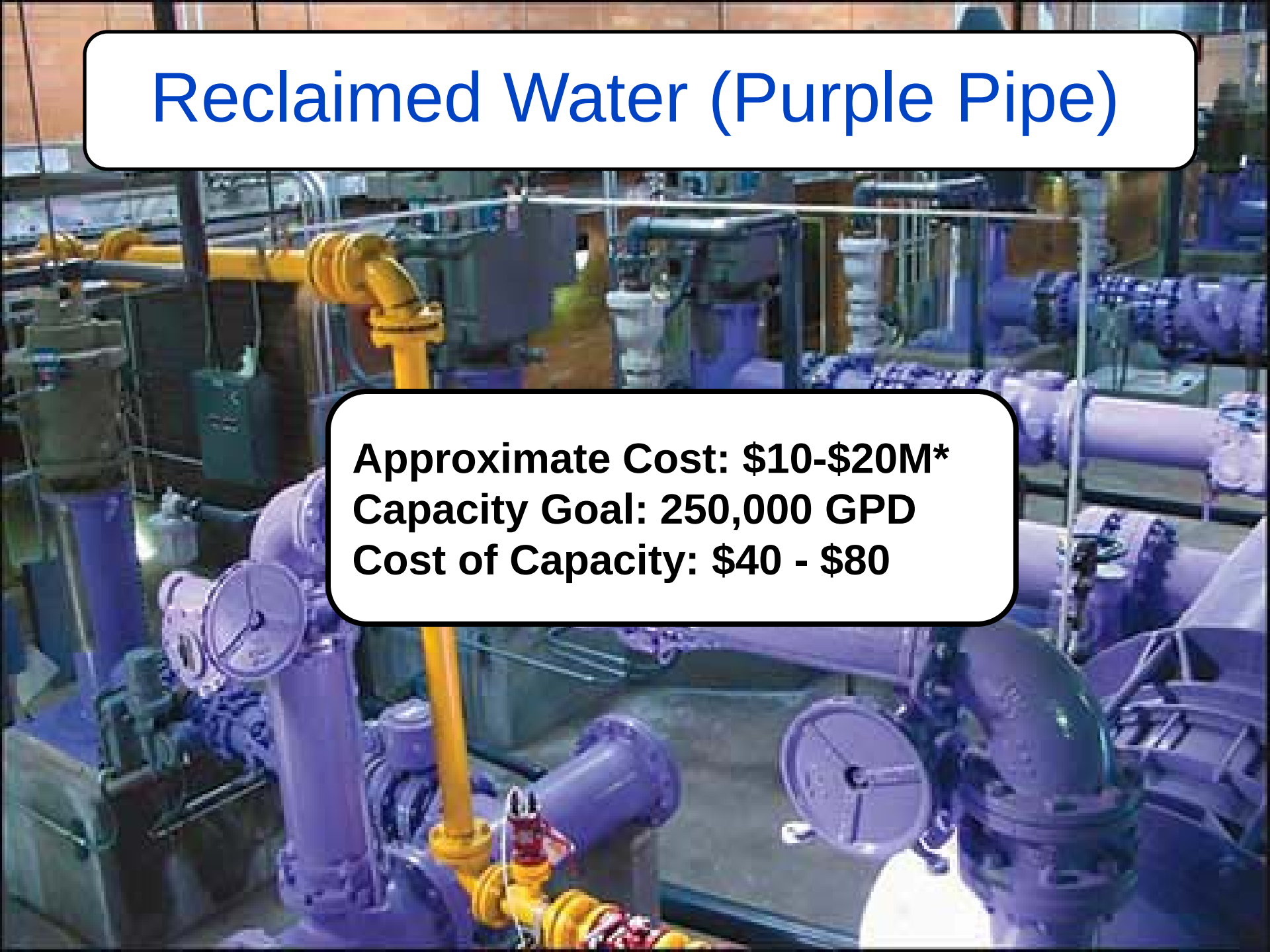
- Cost comparisons are for illustration purposes only to demonstrate the concept of capacity cost relativity. Case-by-case cost comparisons will need to be made in your area for all presented alternatives as costs can vary drastically region by region.

- We are only comparing costs (per gallon/day) of:
  - **New** water creation capacity
  - **New** water treatment capacity
  - **New** nega-gallon / conservation capacity

Drilling New Water Wells

Cowlitz County, WA
Cost: $38.7 Million*
Capacity: 10-20 Million GPD
Cost of Capacity: $1.93 - $3.87

Reclaimed Water (Purple Pipe)

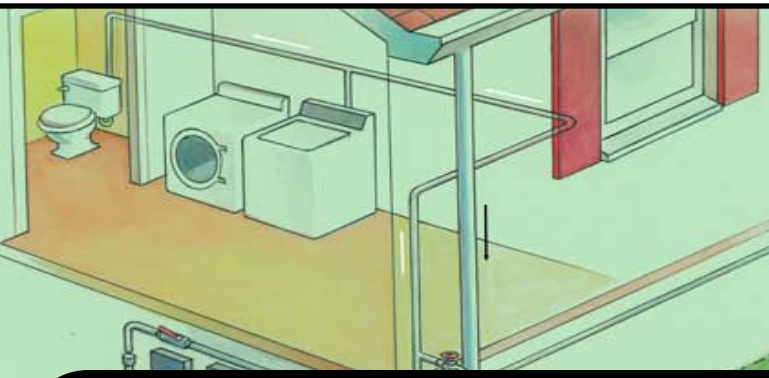


Approximate Cost: $10-$20M*
Capacity Goal: 250,000 GPD
Cost of Capacity: $40 - $80

Rainwater Collection

Illustrated is an example of how a rainwater harvesting system could be used in a residential application.

Harvested rainwater can be used for:
- Toilets
- Irrigation
- Laundries or
- Other non-potable uses.



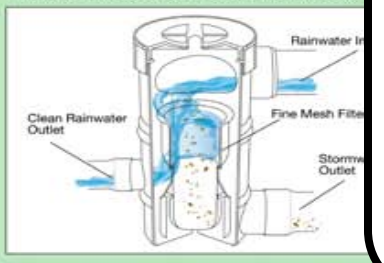
Residential

Cost: $10,000

Capacity: 180 GPD

Cost of Capacity: $55.55

How the Vortex Rainwater Filter Works



Storage Tank Floating Filter and Hose
Fig. #RH9532C

3 The floating filter and pump extracts the harvested rainwater from the cleanest part of the tank, just below the water surface for use in the house.

Figure Number: RH9530DOK – Multi-functional Overflow Device

4 The overflow/backwater device in the tank is designed to skim floating particles from the surface of the water when the storage unit overflows.

Overflow from a rainwater system can be used for groundwater recharge, reducing stormwater runoff.

Above or Below Grade Applications
Figure Number: RH9520-06

1 At the point of discharge, the high capacity vortex rainwater filter removes large and fine debris.

Smoothing Inlet
Fig. #RH9530SI

2 From the filter, the collected water enters the storage tank or cistern through the smoothing inlet which prevents agitation of sediment and oxygenates the water.

Float Switch
Fig. #RH9542FSC – Water Feed, Normally Closed (N/C)

Pump

Tank
Water quality in the tank is maintained by removing the organic matter and by the action of incoming water which introduces oxygen. Water that is kept aerobic in this way does not become malodorous even when stored for long periods.

NOTE: During low rainfall events, an alternative make-up water source such as the city or county water system is required to replenish the storage tank. The appropriate backflow preventer assemblies, per the local jurisdiction, are required for this application.

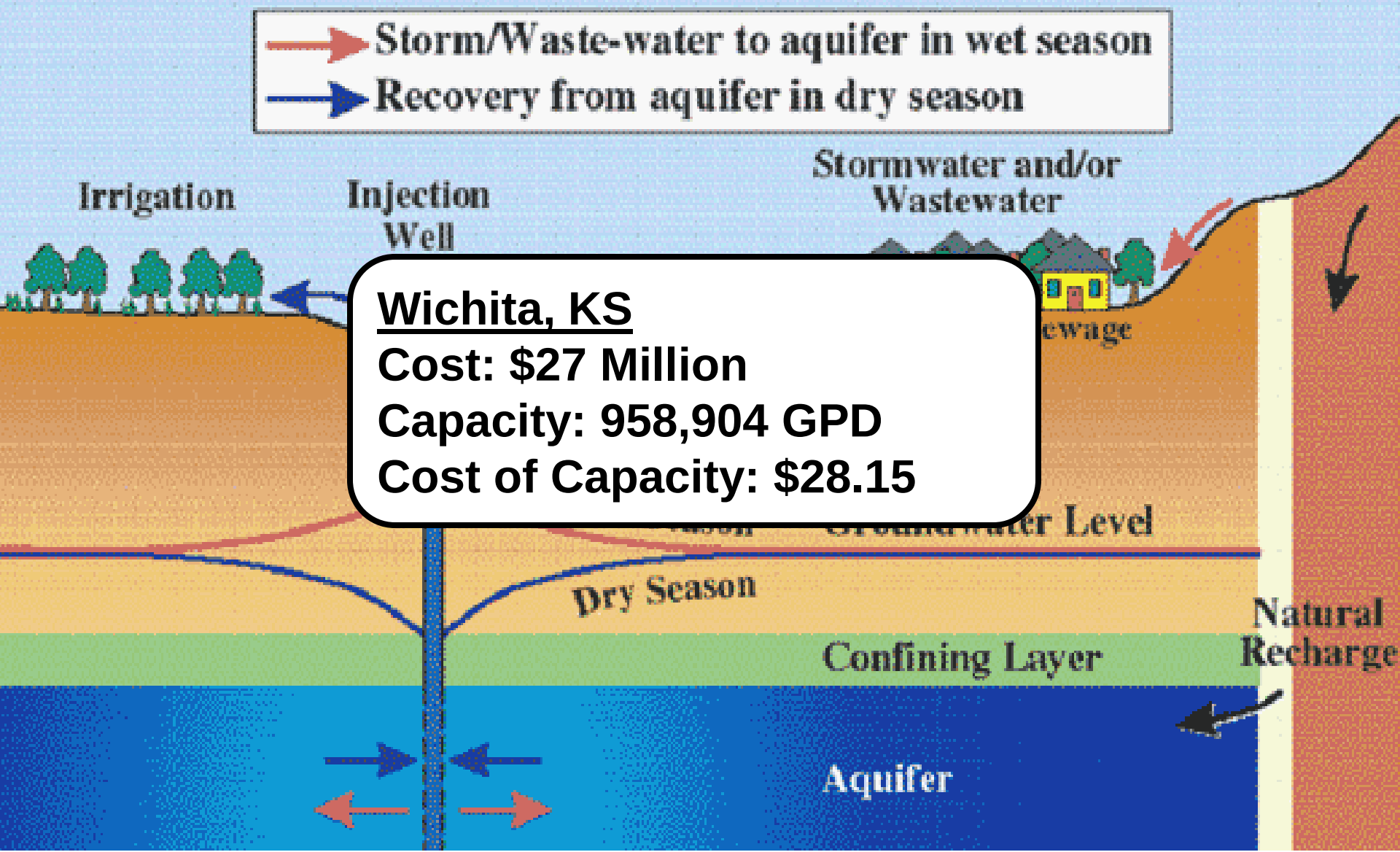
RMS WISY

A product of WISY AG in cooperation with RMS.

Member of: and

Greywater Systems

Aquifer Storage and Recovery



Wichita, KS

Cost: $27 Million

Capacity: 958,904 GPD

Cost of Capacity: $28.15

Desalination

<u>Sydney, Australia</u>
Cost: $1,495 Million
Capacity: 66 MGD
Cost of Capacity: $22.65

WATER FODDER

WATER FODDER

Cost of Creating:

- New Water Capacity
- New Water Treatment Capacity
- New Nega-Gallon / Conservation Capacity

Waste Water Treatment Plant I

Brightwater
Cost: $1.84 Billion
Capacity: 36 Million GPD
Cost of Capacity: $51.11

Waste Water Treatment Plant II

<u>Hawks Prairie Estimate</u>
Cost: $99.4 Million
Capacity: 5 Million GPD
Cost of Capacity: $19.88

On-Site Waste Water Treatment

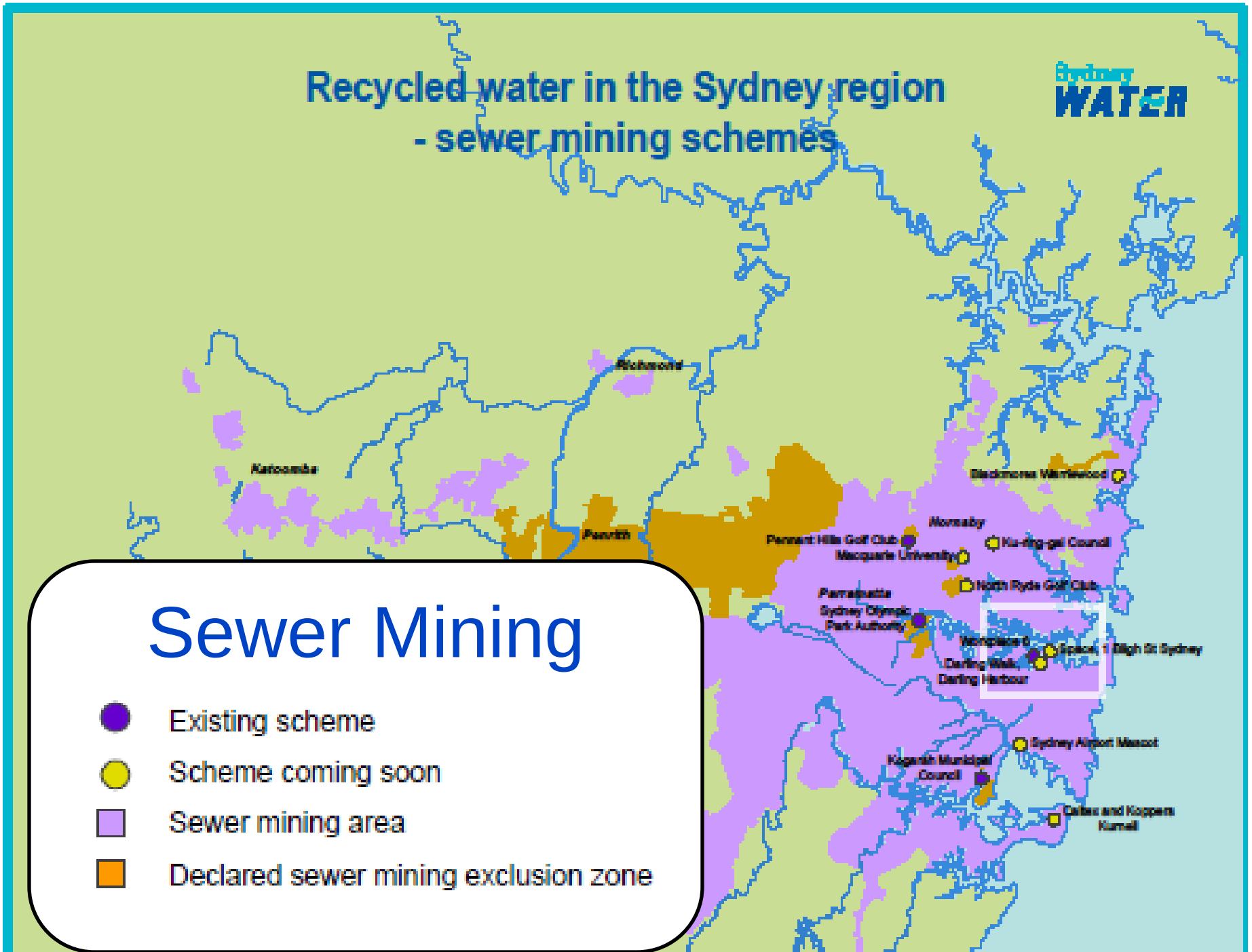
Islandwood

Cost: $100,000 - $150,000

Capacity: 3,000 GPD

Cost of Capacity: $33.00 - $50.00

Recycled water in the Sydney region - sewer mining schemes



Cost of Creating:

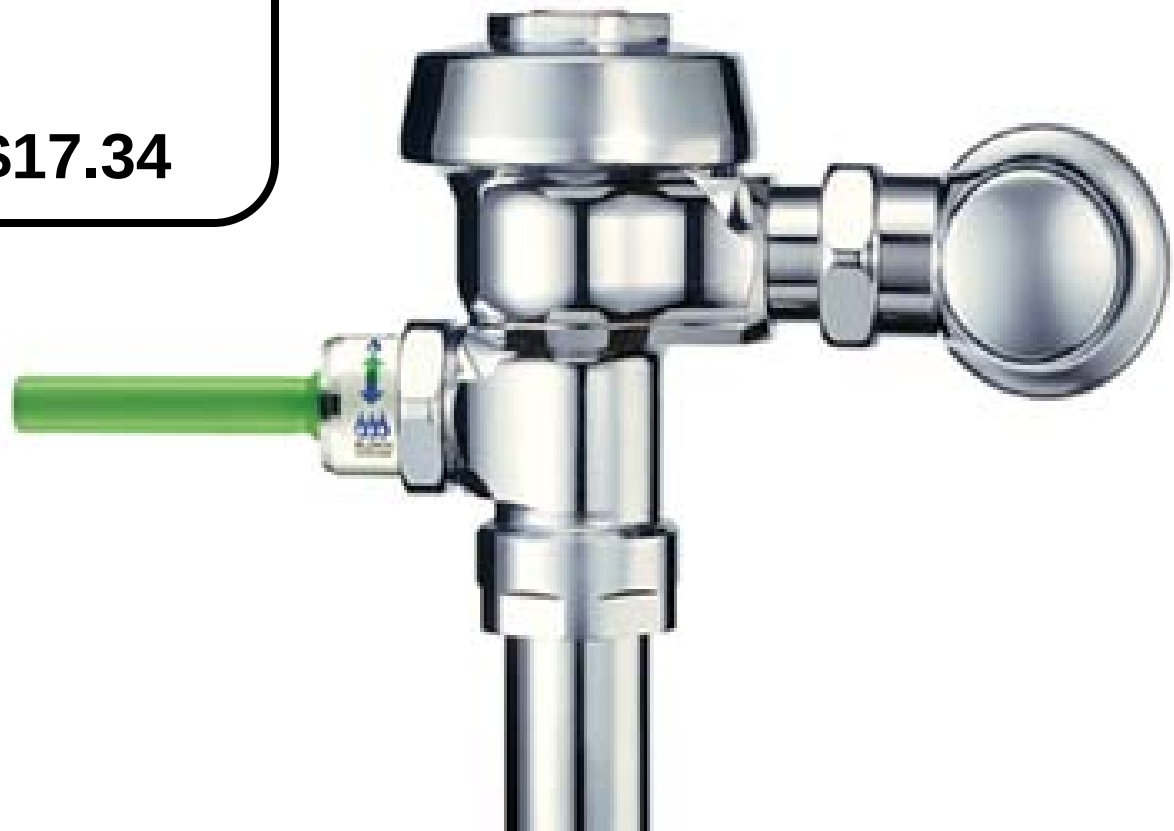
- New Water Capacity
- New Water Treatment Capacity
- New Nega-Gallon / Conservation Capacity

Dual Flush Flushometers

Commercial
Cost: $644
Capacity: 26.8 GPD
Cost of Capacity: $24.02

Dual-Flush Flushometer Retrofit Kits

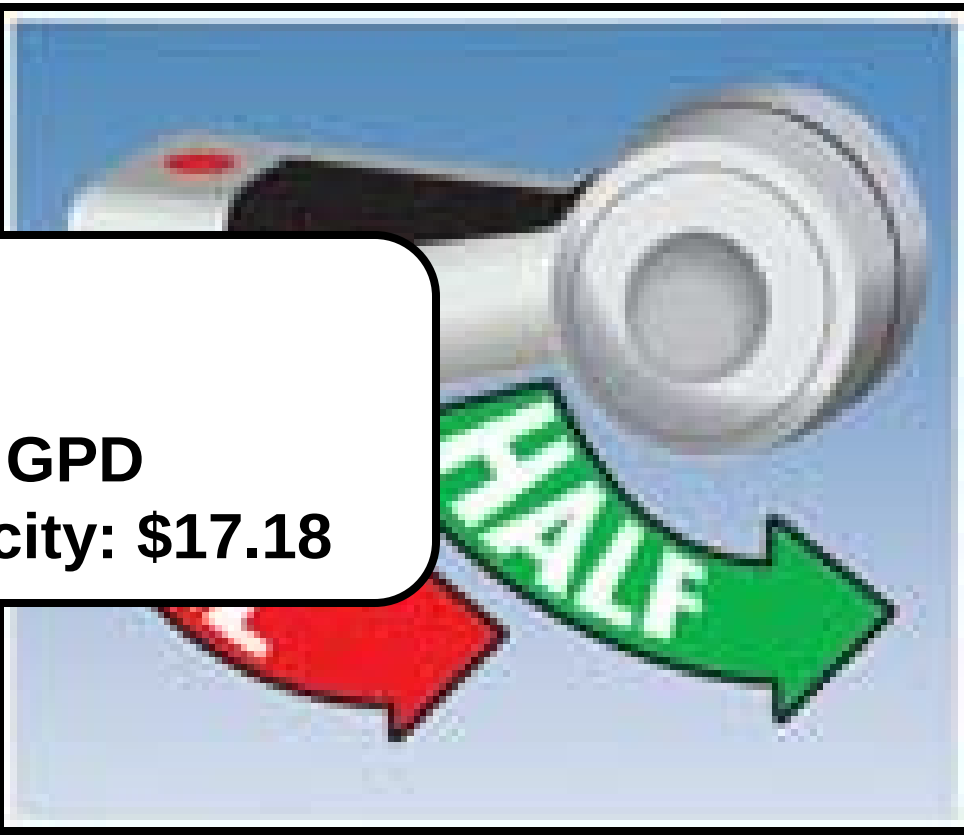
<u>Commercial</u>
Cost: $111
Capacity: 6.4 GPD
Cost of Capacity: $17.34



1.28 / 0.8 GPF Tank-Type Water Closets

<u>Commercial</u>
Cost: $658
Capacity: 30.48 GPD
Cost of Capacity: $21.60

Tank-Type Water Closet Dual Flushometer Retrofit Kits



<u>Commercial</u>
Cost: $110
Capacity: 6.4 GPD
Cost of Capacity: $17.18

Pint Urinals

<u>Commercial</u>
Cost: $1,330
Capacity: 27.4 GPD
Cost of Capacity: $48.54

High Efficiency Shower Heads

<u>Residential / Commercial:</u>
Cost: $78
Capacity: 10.0 GPD
Cost of Capacity: $7.80

High Efficiency Faucets

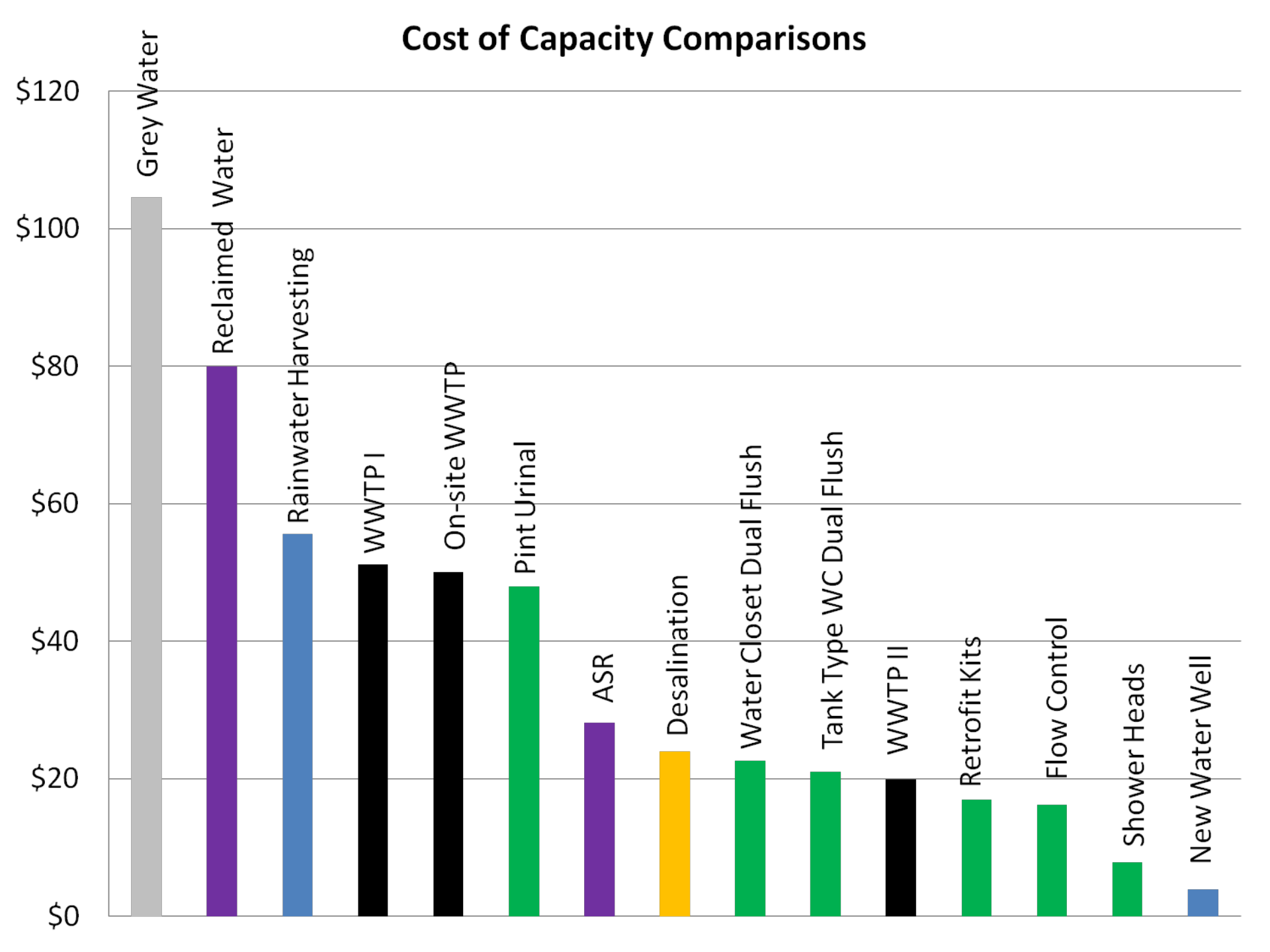
<u>Residential / Commercial:</u>
Cost: $65
Capacity: 4.0 GPD
Cost of Capacity: $16.25

WATER FODDER

WATER FODDER

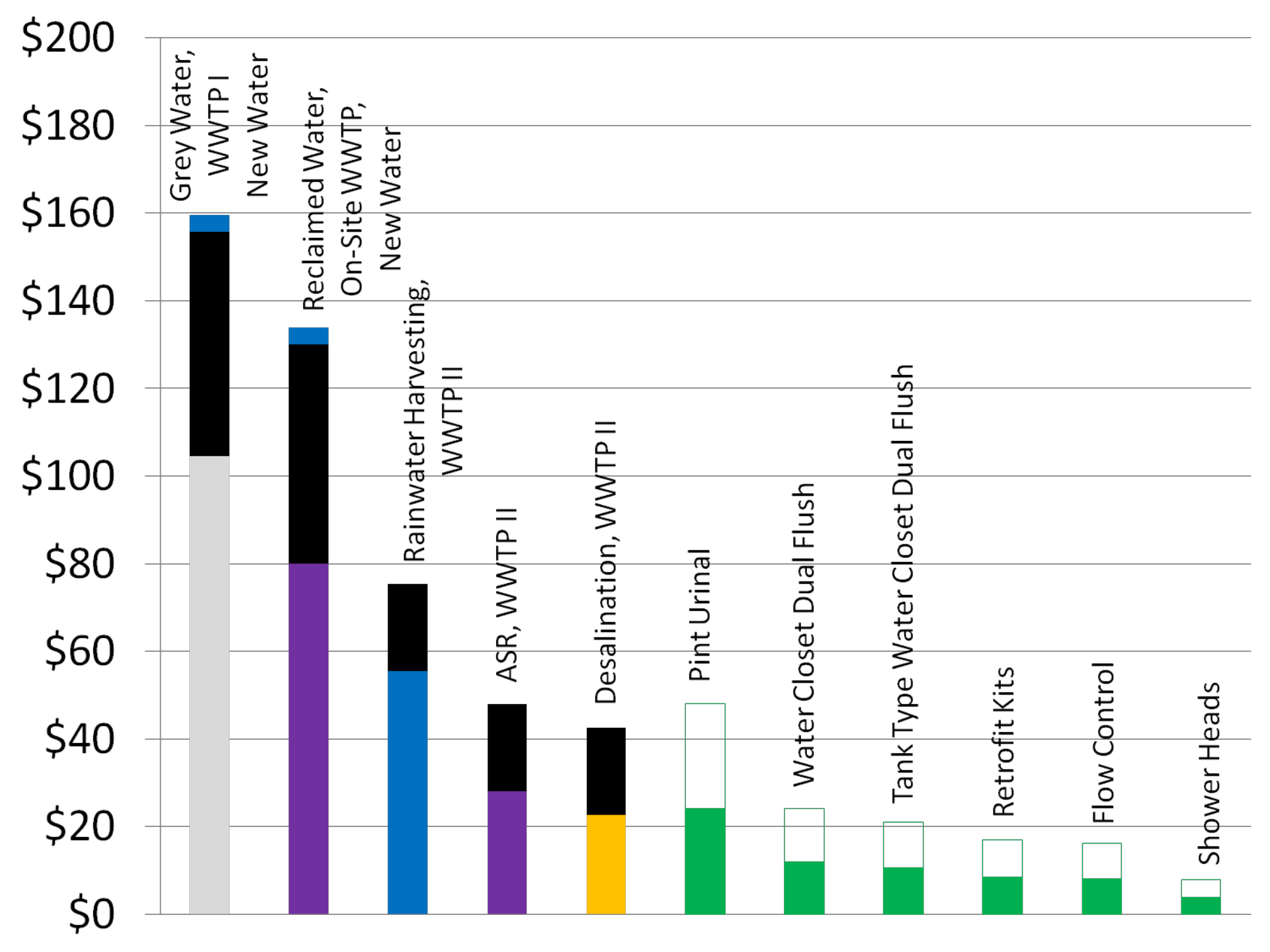
Cost of Creating:

- New Water Capacity
- New Water Treatment Capacity
- New Nega-Gallon Capacity


Cost of Capacity Comparisons
$120
$100
$80
$60
$40
$20
$0
Grey Water
Reclaimed Water
Rainwater Harvesting
WWTP I
On-site WWTP
Pint Urinal
ASR
Desalination
Water Closet Dual Flush
Tank Type WC Dual Flush
WWTP II
Retrofit Kits
Flow Control
Shower Heads
New Water Well

A better comparison:

- **(**New Water Capacity **+** New Water Treatment Capacity**) vs.**
- **_____% ** New Nega-Gallon Capacity


$200
$180
$160
$140
$120
$100
$80
$60
$40
$20
$0
Grey Water, WWTP I New Water
Reclaimed Water, On-Site WWTP, New Water
Rainwater Harvesting, WWTP II
ASR, WWTP II
Desalination, WWTP II
Pint Urinal
Water Closet Dual Flush
Tank Type Water Closet Dual Flush
Retrofit Kits
Flow Control
Shower Heads

Time Frame Considerations

- Purple Piping Systems: 6-10 Years
- WWTP: 6-10 Years
- Desalination: 6-10 Years
- Aquifer Recovery and Storage: 5 Years
- New Wells: 1-5 Years
- Nega-Gallon Construction: 1-6 Months

WATER FODDER

It takes ___ gallons
of water to make 1 pint
of beer

WATER FODDER

It takes **40** gallons
of water to make 1 pint
of beer


THANK
YOU