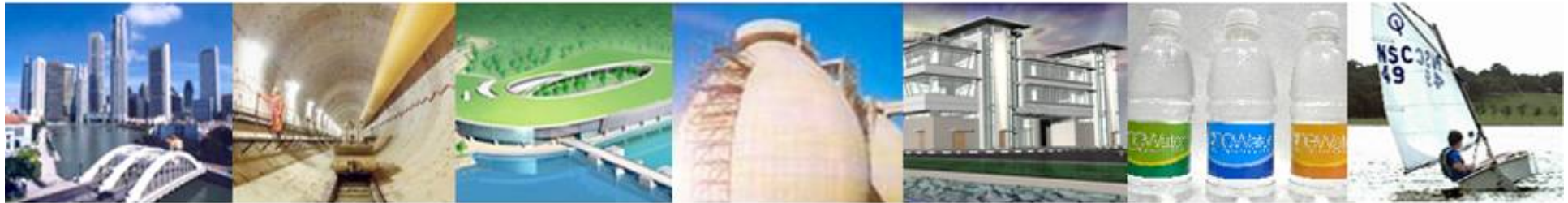


Water for All
Conserve, Value, Enjoy



Beyond Tap Water: NEWater wins Public Confidence in Singapore

George Madhavan
Director, 3P Network
PUB, the national water agency of Singapore

FOUR NATIONAL TAPS



Water for All: Conserve, Value, Enjoy



Water Recycling: Bane or Boon?

- Cost-effective and sustainable source of water
 - Multiplies the water supply
 - More reliable than conventional sources
- Yet, not widely embraced as a source of water supply
- Public confidence and acceptance key to a successful water recycling programme

Overview of NEWater

- Singapore's own brand of high-grade reclaimed water introduced in 2002
- Pillar of Singapore's water sustainability
- Supplied primarily for non-domestic use
- Small percentage put into reservoirs before being treated for drinking water
- NEWater currently meets 30% of Singapore's water supply



Quality Assurance

- Comprehensive water sampling and analysis programme
- Extensive physical, chemical and microbiological tests over a two-year period
- 190 parameters incorporated and more than 25,000 analyses carried out to date
- Panel of international water experts provide independent advice
- Regular audits and review of results and plant operations by internal and external audit panel

Key Challenges



Overturing public's psychological fear and stigma



Focus on treatment process, which involves using advanced, state-of-the-art membrane technology, instead of source

Translate technical information in a simple, layman manner through use of simple diagrams and familiar objects ▶



Present terminology had negative connotation



Replace terms that would better reflect the process or its value as a resource

Eg. **used water** instead of wastewater and sewage

Water reclamation plants instead of Sewerage treatment plants



Mindset change needed to get public to understand that water recycling was part of nature



NEWater process was to speed up the natural water cycle

Unplanned Indirect Potable Use practised in Europe for centuries (eg Thames River in London)

- In contrast, planned indirect potable use offers more reliability and quality assurance as water managers typically employ more advanced technology

Engaging the stakeholders

Communications with stakeholders is key to success of campaign

- Key messages:
 - NEWater is a safe and sustainable source of water supply for Singapore and meets WHO drinking water guidelines
 - NEWater will make the overall water supply system more resilient

Media

Opinion leaders

Public

Other tools for the promotion of NEWater and tapwater

PUB's Tagline & Mascot



Water for All: Conserve, Value, Enjoy

- Ensured a diversified and sustainable supply of water for Singapore with the Four National Taps
- Calls on all Singaporeans to conserve water, keep our waters clean & build a relationship with water so we can enjoy our water resources

Water Wally

- Shaped like a water droplet with an infectious grin, Water Wally is a personification of water and of PUB
- Convey important water messages such as enjoying our waters in a fun & hip way
- Winner of the IWA Best Promoted Water Protection Activity / Programme



Outreach Programmes

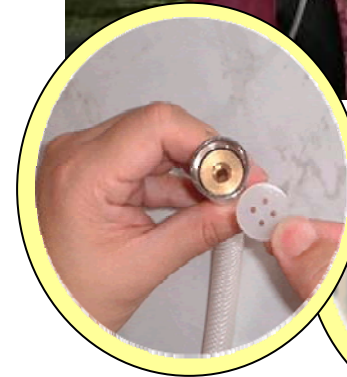
Public Education Programme

School talks, Water Wally shows, Water Detective Programme



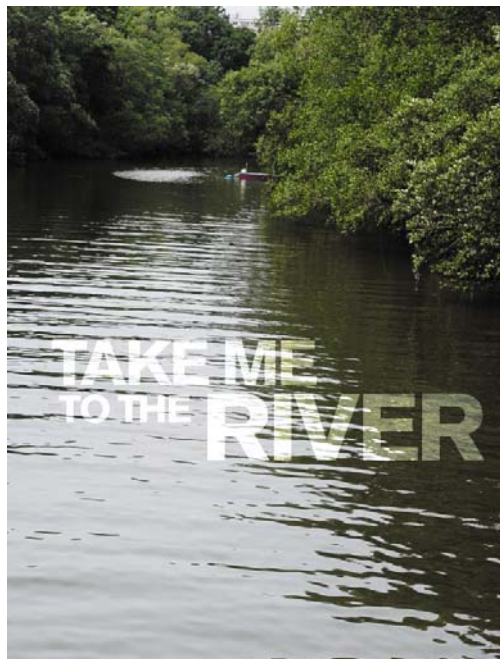
Water Efficient Homes

- launched in all constituencies
- installation of water thimbles & cistern water saving bag
- achieve up to 5% in water savings



Reaching out to the young

PURE, a lifestyle street magazine on water was launched to reach out to the youth and get them interested in water issues



From zero to hero

- Public confidence and acceptance key to success of any water reuse programme
- NEWater has put Singapore on world map for water reclamation
 - Award of Excellence” , National Water Research Institute, USA, May 2002
 - Environmental Contribution of the Year, Global Water Awards 2008





Sustainable Water Solutions for a Changing Urban Environment

Date: 4 to 8 July 2011

Venue: Suntec Singapore

- The **global platform for water solutions**
 - Brings together **policymakers, industry leaders, experts and practitioners**
 - Address challenges, showcase technologies, discover opportunities & celebrate achievements
- **Key highlights** include **Lee Kuan Yew Water Prize, Water Leaders Summit (by invitation only), Water Convention, Water Expo & Business Forums**

Year	No. of attendees	No. of countries participated	Value of deals, tenders & investments announced	No. of co-located events	No. of participating companies in Water Expo
2008	8,500	79	S\$380m	42	350
2009	10,000	82	S\$2.2b	76	420
2010	14,000	112	S\$2.8b	120	514



Thank You

Reverse Osmosis Pore Size \times 100 Million Times = Size of Tennis Balls



Engaging media as partners

- Briefings and visits to NEWater demo plant
- Media familiarisation trip to USA (eg Orange County, California and Scottsdale, Arizona)
- News features expounded on the use of reclaimed water in these cities
- Television documentary ‘Thirsting for new sources’ broadcast in four languages



The Straits Times, 18 July 2002

This story was printed from channelnewsasia.com

channelnewsasia.com

Title : US residents in Orange County drinking reclaimed water for 27 years
 By :
 Date : 17 July 2002 21:04 hrs (SST)
 URL : <http://www.channelnewsasia.com/stories/americas/view13678/11.html>

The idea of drinking NEWater, or reclaimed water, may be new to Singaporeans, but residents in some US cities have been drinking such water for 27 years!

Channel NewsAsia covered a PUB study trip to Orange County, California. Reclaimed water isn't used just to water plants and wash pots in Orange County. Millions of people in the city have been drinking it since 1975.

Mr John Collins, Resident of Orange County, said: "I believe the water is safe. It's been purified, it's gone through a strict standard. I feel very comfortable drinking the water."

Orange County currently imports its water from several neighbouring American cities. But this is not without problems. In a drought, Orange County is last in the queue.

Mr Ron Wildermuth, Public Information Officer of Orange County Water District, said: "We see imported water supply becoming more politically challenged while our population grows, and it's not people immigrating but our own families having families. So we gotta deal with it."

So, to give itself an additional source of reliable water supply, Orange County puts its reclaimed water into a massive underground reservoir.

And like what Singapore plans to do, the reclaimed water is mixed with other sources, including the Santa Ana River.

Water Factory 21, as the plant is called, has been in operation since 1975.

This means that the residents in the area have been using reclaimed wastewater for the past 27 years.

Currently the plant can treat about 50,000 cubic metres of water every day - enough to fill about 26 Olympic-sized swimming pools.

And that supply will go up by five times, when a new, more advanced treatment plant is opened in four years.

The new plant, called the Groundwater Replenishment System, will purify treated waste water by passing it through membranes and filters before disinfecting it with ultraviolet light.

The new plant will adopt the same purification techniques currently used at Singapore's water reclamation plant.

And like Singapore, Orange County conducts regular tests to ensure the water is safe to drink.

Another state in the east of the US is also using reclaimed water.

It has been mixing reclaimed water into its surface reservoirs since the early 70s.

The water is treated before it is piped to homes.

Channel NewsAsia, 17 July 2002



Endorsement by leaders

- Top government officials including the then Prime Minister of Singapore showed their support by drinking NEWater publicly



Expert Opinion

- Endorsement by water experts helped to lend credibility

Business Times,
12 July 2002

NEWater gets panel's clearance

2-year study clears flow of reclaimed water into reservoirs

By Ching Poh Ming
[SINGAPORE] After two years of study, a panel of international experts has submitted a report that is likely to provide the signal for Singapore to go full steam ahead to produce recycled water as an additional source of water for consumption.

According to the Public Utilities Board yesterday, the panel has concluded that the reclaimed water, or NEWater, that Singapore has been producing so far on a limited basis is a "safe and sustainable source of water for Singapore."

"It has also supported the prudent potable use of NEWater in Singapore. This means first storing and mixing NEWater with the water in our reservoirs and subsequently further treating it to become drinking water," said the PUB, which is currently evaluating the panel's report. The panel is led by Professor Ong Choon Nam, director of the National University of Singapore's Centre for Environmental and Occupational Health Research.

In recommending NEWater for indirect potable use, the panel noted that this has been practised in the United States for over two decades.

There, reclaimed water is used to recharge reservoirs and aquifers, which are bodies of underground water.

"The purified water surpasses the stringent conventional water treatment to produce drinking water. Singapore's move to produce reclaimed water is expected to reduce its water dependence on Malaysia, which has been a source of friction between the two neighbours.

Signalling the new strategic direction in April, Prime Minister Goh Chok Tong told Parliament: "It is not healthy to always have Duterte's sword hanging over our heads. It breeds mistrust and suspicion, and does not make for a productive relationship.

"It may be better for bilateral relations if we start to move a little away from our reliance on Malaysia's water."

The PUB will be making its recommendations, based on the report, to the government in two months.

It said that under the supervision of the panel, the Centre for Advanced Water Technology and the NUS Microbiology Laboratory have conducted comprehensive physical, chemical and microbiological analyses on NEWater over a period of two years.

"The Panel of Experts found that NEWater is produced here in Singapore with stringent purification and treatment processes using advanced dual-membrane (micro-filtration and reverse osmosis) and ultra-violet technologies," the PUB said.

"It concluded that NEWater is consistently of high quality, well within the requirements of the United States Environmental Protection Agency's National Primary and Secondary Drinking Water Standards and World Health Organisation's Drinking Water Quality Guidelines," the PUB added.

Among the panel members are Professor Joan Rose, an international specialist in water pollution microbiology, and William Lester, a pioneer in water reclamation projects. Both are Americans.

The other members are Professor Ng Wun Jern, dean of NUS Faculty of Engineering; Dr Chew Shook Kai, director of the Health Ministry's Epidemiology and Disease Control Division; Professor James Tam, dean of Nanyang Technological University's School of Biological Sciences; Associate Professor Mulkil Singh, deputy director, infrastructure management, health science authority; and Professor Lee Han Kee, deputy head of NUS Department of Chemistry.

channelnewsasia.com
Singapore News . . .



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Last modified: 11 July 2002 2050 hrs (SST) 1250 hrs (GMT)

Experts endorse NEWater as safe for drinking

By Hasnita A. Majid

After two years of tests, an international panel of experts has endorsed NEWater as a sustainable source of water for Singapore.

channelnewsasia.com
Singapore News . . .



First created: 16 July 2002 2100 hrs (SST) 1300 hrs (GMT)
Last modified: 16 July 2002 2117 hrs (SST) 1317 hrs (GMT)

NEWater of higher quality than most drinking water in the world - expert

By Hasnita A. Majid

NEWater is of a higher quality than most drinking water throughout the world - even in the United States!

A foreign expert with more than 20 years of experience said NEWater far surpassed the standards used by international bodies.

This is as good as it gets....the expert panel that did the study and PUB Chairman Tan Gee Paw drinking NEWater straight from the factory....to show it's indeed safe.

NEWater went through 191 water quality parameters, more than the 118 needed by the World Health Organisation and 86, by the US Drinking Water Standards.

Professor Joan Rose, Microbiologist and Member of Expert Panel of NEWater Study, said: "The study done here in Singapore was a two-year intensive study and really it's more exhaustive that I've ever been involved with in terms of the number of types of contaminants.

"It's of a higher quality than most drinking water throughout the world and drinking water even throughout the US. It compares very, very favourably with other indirect potable-used projects in the US in that they do use drinking water guidelines as their yardstick."

Professor Rose is an international expert in water pollution microbiology, waterborne disease and public health issues with more than 20 years of experience in the field.

Professor Ong Choon Nam, Chairman of Expert Panel of NEWater Study, said the two-year study at the Centre for Advanced Water Technology and NUS Microbiology laboratories include testing for contaminants like endocrine disruptors.

This is a compound similar to hormones that affect human reproduction.

Tests were also done on mice and fish.

Channel NewsAsia,
16 July 2002

'Channel NewsAsia, 11 July 2002

NEWater Visitor Centre

- Pillar of public education campaign
- Officially opened in Feb 2003
- State-of-the-art water museum that explains the concept and technology behind NEWater and how it plays a part in Singapore's water strategy
- Multimedia animations and interactive touch-screens
- NEWater plant incorporated as part of the centre to enhance learning experience



Engaging the public

- Briefings for Members of Parliament, grassroots leaders and business groups to garner feedback
- Exhibitions held at community and school levels



Public Sampling

- NEWater bottled in attractive packaging for public sampling
- Distributed at grassroots and national events, and at NEWater Visitor Centre
- 1 million bottles reached in 100 days
- More than 20 million bottles distributed to date



Public support for NEWater

- Strong acceptance of NEWater by the public
- 60,000 Singaporeans toasted to NEWater at 2002 National Day Parade.
- Independent survey by Forbes Research at the end of 2002 confirmed the success of the programme.
 - 98 per cent acceptance rate, with 82 per cent of respondents indicating that they would drink NEWater directly and another 16 per cent would drink it mixed with reservoir water.



Sustained Public Education on NEWater

- NEWater Visitor Centre continues to be main vehicle for sustained public education on NEWater
- 800,000 visitors to date
- Accolades:
 - Highly recommended award under the International Water Association (IWA) – Marketing and Communication Award for School Information Programme (2005)
 - Best Sightseeing/Leisure/Educational Programme at Singapore's 20th Tourism Awards 2005

