

Nanofiltration

Presentation By: Tad
Microbots, FLL
November 2008

Water...

- It's crucial to our survival on Earth!
- 97% of Earth's water is saltwater!
- Can we drink salt water?
- Seawater cannot be used in its initial form.
- Contaminating salts must be removed.
- How can we provide everyone/ everywhere clean and "climate resilient" water?

Water's future:

- World's population predicted to more than double in next 40 years to 10 billion.
- Brisbane population to reach 6 million!
- Cary's population to reach to reach 6 million!
- Demand for fresh water by individuals, industries, and communities worldwide will be huge burden.
- Unpredictable "climate" related problems?

Can We Desalinate the Seawater?

- Can we utilize that salty 97% of earth's water?
- Desalination is an existing process that removes salt from water.
 - Any problem with desalination?
 - Yes. Desalination techniques are very pricey, not "green", and an inadequate means to provide reliable source of drinking water.
- So, what else can we do?

Nanofiltration is cool!

- Nanofiltration is an inexpensive technique that prepares climate resilient, usable, potable water!
- Cost is as low as 30-50 cents per 10,000 gallons!
- Highly effective in transforming sea water, waste, grey, other water into potable water
 - Australia is using nanofiltration to make potable water from pig-sewage waste water !
- A great option for world-wide water future.

How does Nanofiltration work?

- Tiny one-celled organisms eat contaminants present in water (this is called “bioremediation”)
- Water filtered through porous membranes, like a “sieve”.
- Holes in “sieve” are microscopic and highly effective!
- Can only be seen on “nanoscale”.
- Result is CLEAN, potable water.

Does it really work?

- Yes it really does work!
- Nanofiltration and bioremediation together use very little energy.
- Provide our world with a “green” technology for securing future generations world-wide-water.
- And guess what? Waste from nanofiltration highly calorific and can be used as fuel! Wow!

How much does it cost?

- Many types of nanofiltration systems available today.
- Residential “sink” to “whole house” models run from about \$500 to \$5000, depending on level of filtration.
- Commercial systems (2000 gallon to 10,000 +) run from \$10,000 to much more.
- You can get a nano system that filters just a few elements, or a system that filters everything, like turning sewer water into potable water!

Nanofiltration 500 GPD Model



Source: <http://www.flickr.com/photos/27766219@N05/271336524/>

So, are we doing it?

- In 2008, communities worldwide are making the connection between the value of nanotechnology and the future for water on planet earth.
- Hope to be able to very cheaply provide nanofiltration systems for individuals and communities well within decade.
- Nanofiltration units , both smaller and whole-house or commercial grade, readily available.

Education is the Key

- We need to educate our communities on the awesome ways that we can ensure **water -4-tomorrow** for our children and grandchildren!
- Nanofiltration just one promising method!
 - Desalination, water-harvesting (dew, fog, storm), greywater collection, rain barrels, and simple at-home conservation strategies are all very important!
- No amount of “water saved” is too small!

A Quote from JFK

- In the words of President John F. Kennedy,
- “If only we could competitively get fresh water from saltwater, this would be in the long range interests of humanity and could really dwarf any other scientific accomplishments!”
- September 22, 1961

Some Neat Links...

- Sources:
- http://nanosense.org/activities/finefilters/nanofiltration/FF_NanofiltrationSlides.ppt
- http://nanosense.org/activities/finefilters/watercrisis/FF_WaterCrisisSlides.ppt
- http://www.esemag.com/0902/nano_1.jpg
- www.cleanwaterproducts.com/nanofiltration
- www.lifestreamwater.com
- www.awwa.org/awwa/education