



Improving  
Plant  
Performance

Case  
Studies &  
Pilots

Filtering  
the Water  
for  
Tomorrow

Applications

FILTRALITE®



## Who We Are



Head Office, Engineering & Sales  
Calgary, AB

Systems Manufacturing  
Watson, SK

Automation and Electrical  
Humboldt, SK

### Sapphire Water International

Canadian experts in the design and implementation of leading-edge, water and wastewater treatment systems for small and remote communities

- Privately-held company formed in 2007
- Fully-integrated manufacturer of advanced, environmentally-friendly water and wastewater treatment solutions
- Over 70 years' combined experience in the water and wastewater treatment field



Capabilities

1

Drinking Water

1

Wastewater

1

# Our Capabilities

- Potable, Process, Industrial, Commercial & Residential
- Water Purification Technologies
- Membrane filtration (UF, RO)
- Biological Filtration
- Manganese Greensand
- Moving Bed Bio-Reactor (MBBR)
- Membrane Bio-Reactors (MBR)
- Media filtration



# Membrane Systems



# Moving Bed Bio Reactor

Over 2000 installations throughout 18 countries



East Coulee, AB 99 m<sup>3</sup>/day (26,150 gpd)



Oyen CO-OP Gas Station, AB 15 m<sup>3</sup>/day (3,963 gpd)



Queen Charlotte Lodge, BC, 75 & 2.8 m<sup>3</sup>/day (19,810 gpd)



Crossfield, AB 20 m<sup>3</sup>/day (5,283 gpd)





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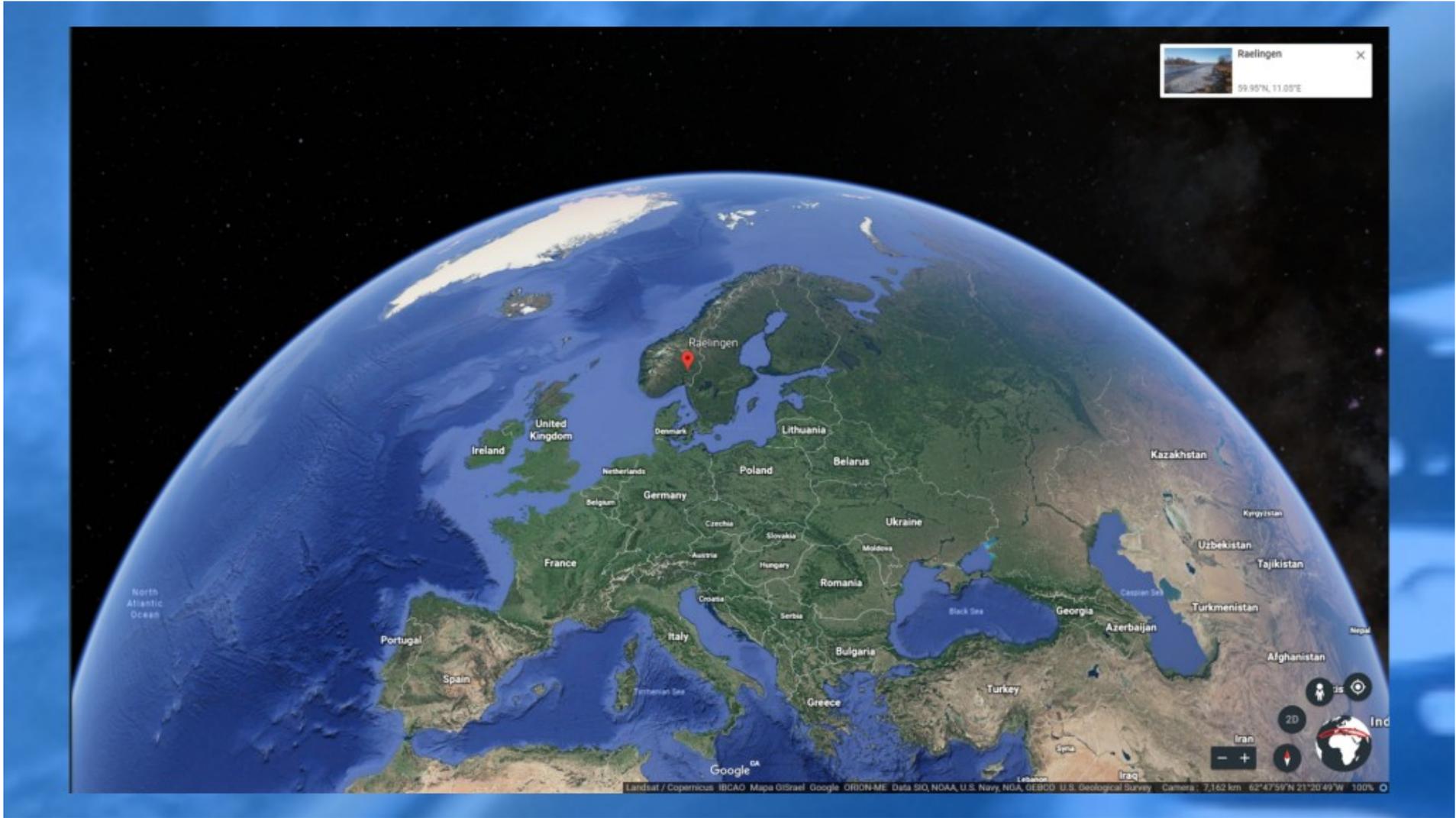


# Who is FILTRALITE®?



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# What is FILTRALITE® ?

- Direct replacement for sand & anthracite in filtration applications
- Superior Performance
- Requires zero capital investment



Highly

1

Porous

1

Durable

1

Clay

1

Based

1

Ceramic

2

Media

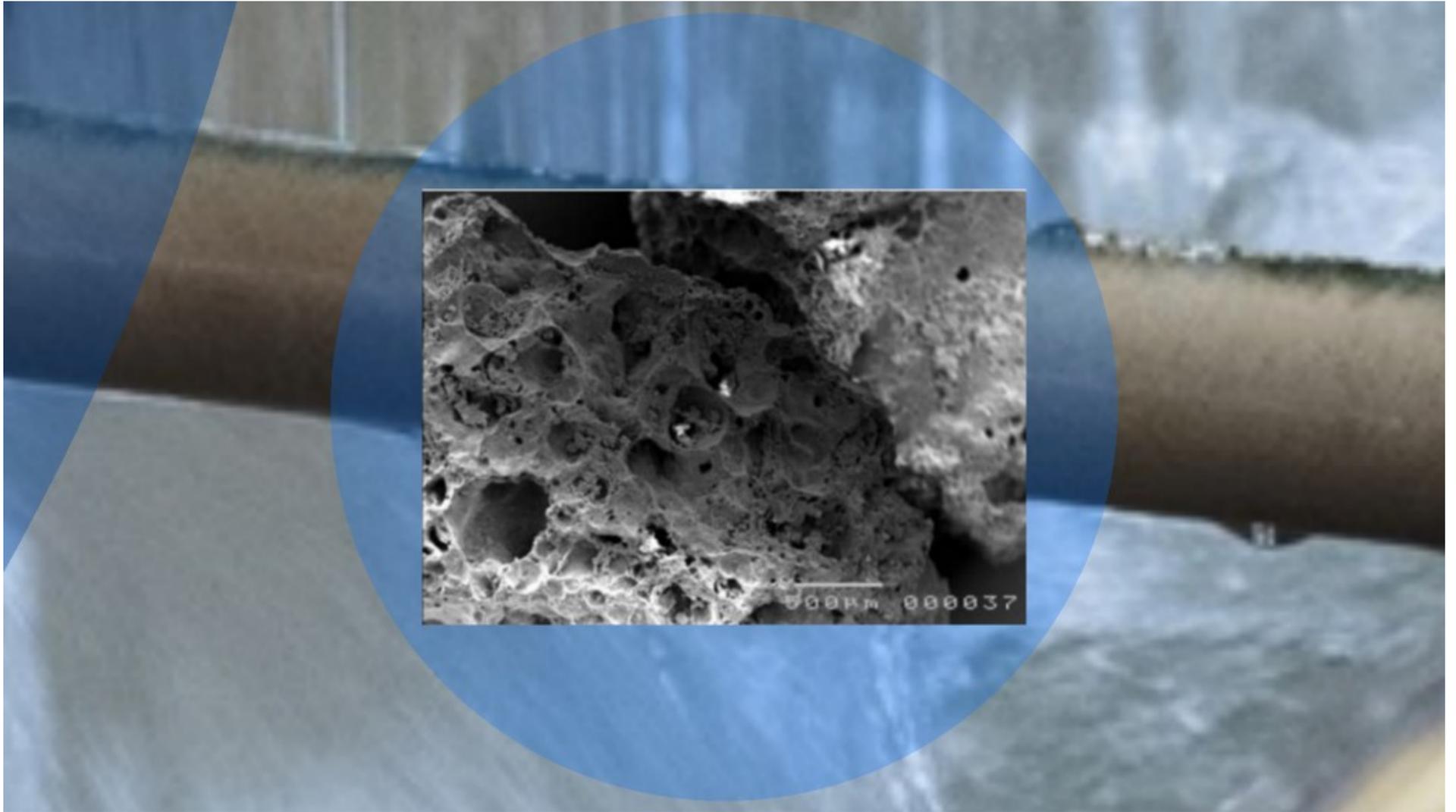
3















<iframe width="560" height="315" src="https://www.youtube.com/embed/8ZoQaE\_1UPo?rel=0&start=116" frameborder="0" allow="autoplay; encrypted-media" allowfullscreen></iframe>



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- Direct Sand / Anthracite Replacement
  - Gravity Beds
  - Rapid Sand
  - Multimedia filters
- Biological Pretreatment



Sibrom

Biological

Pre-Treatment

Remove Fe,  
As, Mn,  
Ammonia

# Sapphire Intregrated Biological Reverse Osmosis Membrane System



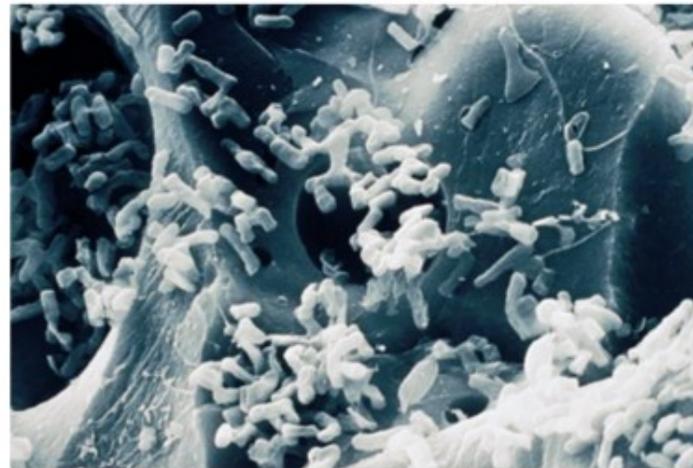


*filtralite*

***"5 Star Hotel Rooms" for  
bio-film forming bacteria***



*Bacteria Attached to filtration material*





10 lps ground water unit



## Goodbye Greensand

Parameter of Interest	Raw Water	Permeate	Guidelines
Ammonium	4.7 mg/L	<0.05 mg/L	<0.1 mg/L *
Arsenic	0.017 mg/L	0.017 mg/L	<10 ug/L
Dissolved Org. Carbon	11 mg/L	<0.5 mg/L	*
Iron	8.49 mg/L	0.032 mg/L	<0.3 mg/L
Hardness	1086 mg/L	76 mg/L	<800 mg/L (Sk)
Manganese	0.25 mg/L	0.006 mg/L	<0.05 mg/L
Turbidity	102 NTU	<0.005 NTU	<0.1 NTU
TDS	2130 mg/L	90 mg/L	AO: <500 mg/L

## Many WW Applications...

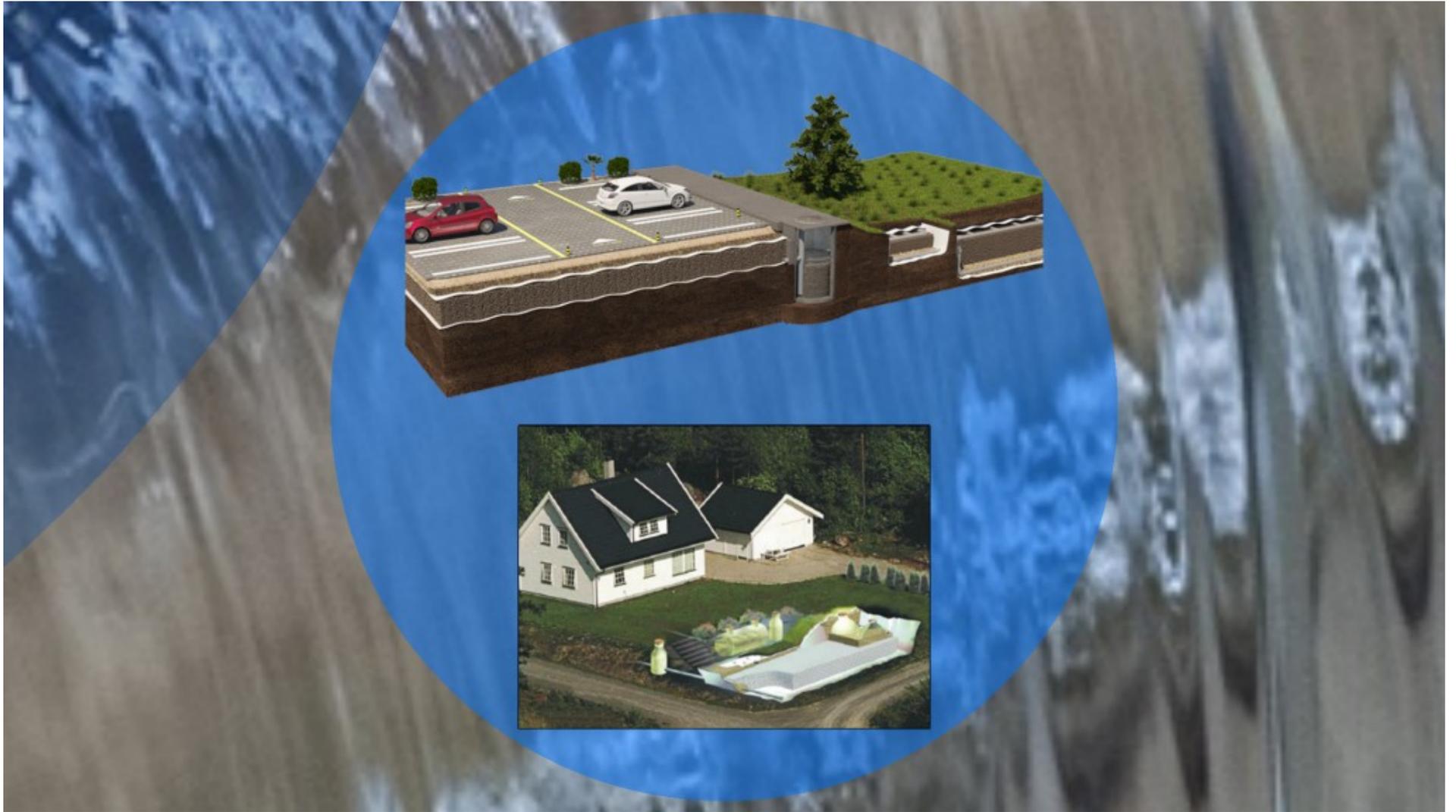
- Nitrification
- Denitrification
- Tertiary Filtration



FILTRALITE® CLEAN  
HC 2,5-5



FILTRALITE® CLEAN  
HR 3-6





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# Improving Plant Performance



Production

1

Operations

2

Environment

3

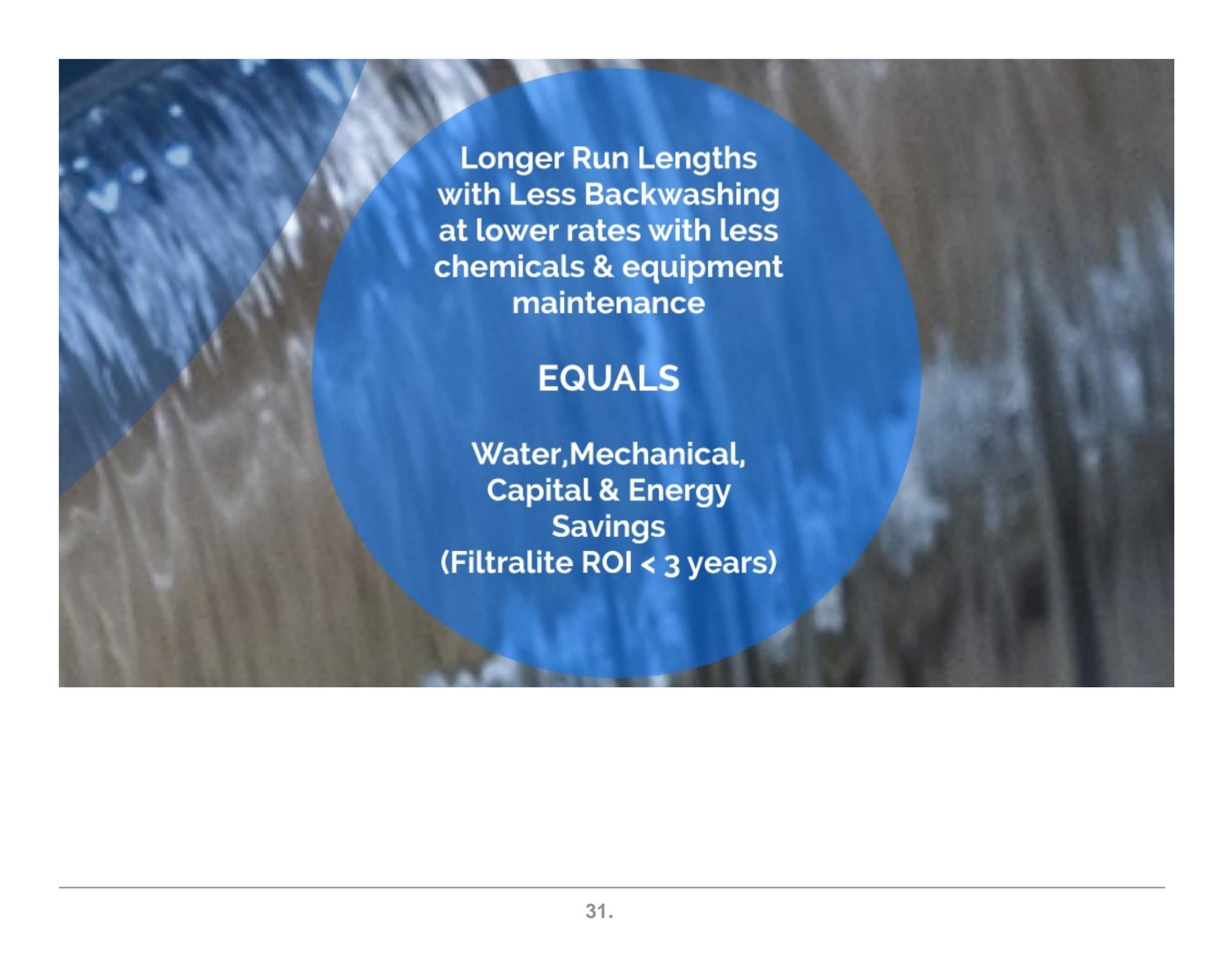
# Production

- Lower initial head loss and buildup  
= LONGER RUN LENGTHS
- Higher flow rate
- Higher particle storage capacity
- In Biofilters >90% removal of Ammonia, Arsenic, Iron, Manganese



## Operations

- Reduced Backwash frequency, flow & volume
- Time between backwashes extended by up to 500%
- Backwash rates lower by 35%
- Long service life (>20 yrs.)
- **SIBROM**
  - Eliminate & reduce chemical feeds
  - No regenerations necessary
  - Long equipment, membrane & media life
  - No CIP's or membrane changes
  - Simplicity of operation

The background of the slide is a close-up photograph of water being filtered through a mesh, creating a textured, rippling effect. A large, semi-transparent blue circle is centered on the page, containing white text. The text is arranged in three main sections: a top section describing operational benefits, a middle section with the word 'EQUALS' in large letters, and a bottom section detailing savings and ROI.

**Longer Run Lengths  
with Less Backwashing  
at lower rates with less  
chemicals & equipment  
maintenance**

**EQUALS**

**Water, Mechanical,  
Capital & Energy  
Savings  
(Filtralite ROI < 3 years)**



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# FILTRALITE®

- Used in over 40 countries
  - 20 Bioreactors in Canada
- 25 Years of Operating Experience
- NSF-61 Approved
- Meets AWWA Media Specifications



Palmachim Desalination plant in Israel increased production capacity by >50 %

Israel

4

Thames  
Water

1

Bedrichov

2

Saskatoon

3

Biological

4

Waste

4



- Inc. filtration velocity from 7m/h to 12m/h
- Runtime between backwashes 30hrs to 200 hrs
- Reduced fouling of RO membranes
- Switched from 20 micron filters changed 1/mnth to 5 micron 2/yr
  - filter savings alone of 300,000 euro / year!!



## How Thames Water reinvented its fast sand filters

*CELEBRATING: Thames Water has strong traditions for being in the forefront of water treatment. Our long term research into different filtering materials has been highly fruitful. Dr. Michael Chipps, head of research at Kempton Water Laboratories.*





## A farewell to sand filters

By replacing the filter sand with Filtralite, Bedrichov Water Treatment Plant reduced energy cost by 75 %, doubled the production capacity of each filter and today delivers the best drinking water ever



*CELEBRATING: "We have clearly seen the many advantages of Filtralite compared to sand as filter medium, and we will go Filtralite 100 %," says regional manager Ladislav Rainis of The North Bohemian Water Company, operating the Bedrichov water treatment plant.*



The City of  
Saskatoon



# Sibrom



## SIBROM Plants

18 full scale SIBROM Water Treatment Plants – 5 in construction

1. Yellow Quill
2. Pasqua
3. George Gordon
4. Whitecap Dakota
5. Dakota Dunes Casino
6. Saddle Lake
7. Poundmaker
8. Muskeg Lake
9. Kawacatoose
10. Witchikan Lake
11. Saulteaux
12. James Smith
13. Moosomin
14. Makwa Sahgeaiehcan
15. Shoal lake
16. Mistawasis
17. Sturgeon Lake
18. Kahkewistahaw (competitor retrofit)
19. Whitecap (System #3)
20. Mankota (1<sup>st</sup> Municipality)
21. Sandy lake (Municipality)
22. Kinistin
23. Town of Craik



FILTRALITE®



## WWTP, OSLO, Norway– 100 million m<sup>3</sup>/year *Filtralite is part of Norway's largest WWTP*

### Performances

	Water velocity	Nitrified load	Results
Nitrification	3-12 m/h	1,2-1,6 kg N-NH <sub>4</sub> /m <sup>3</sup> /j	Nitrification process: 70%
Denitrification	10-35 m/h	Denitrified load 2,5-3 kg/m <sup>3</sup> /j	Denitrification process: 90%



*" The special porosity of expanded clay enables the bio-filters to host bacteria and act as a physical filter simultaneously. "*

**Øystein Moursund**  
Advisor of Veas

>25 yrs. in Operation



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# FILTRALITE® Long Term Vision

- 75-80% of Drinking Water produced in North America uses media filtration
- Sand & Anthracite is a 200 yr. old "technology"
- Imagine one small change that could...



North  
America

Free  
Pilot  
Material

Pricing

Next  
Steps



\*picture taken from Southern Nevada Water Authority

- **Produce millions of gallons more water with less energy**
- **Save millions of gallons of water**
- **Reduce replacement of media, filters and membranes**
- **No Capital Investment!!!**

# Free Pilot Material



## Pricing

- On par with high quality sand & anthracite
- Available for delivery in
  - pails (for pilots)
  - 1-1.5 m<sup>3</sup> (35-50 ft<sup>3</sup>) Bags
  - Bulk shipments



## Contact Us

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