
QWi
WATER IS OUR CONCERN
Produced Water Society
Middle East
PRODUCED WATER
MIDDLE EAST 2019
23 - 24 October, 2019
Sheraton Oman Hotel | Muscat, Oman
www.producedwatermiddleeast.com

TECHNOLOGY
Identify | Develop | Pilot | Deploy

OMV

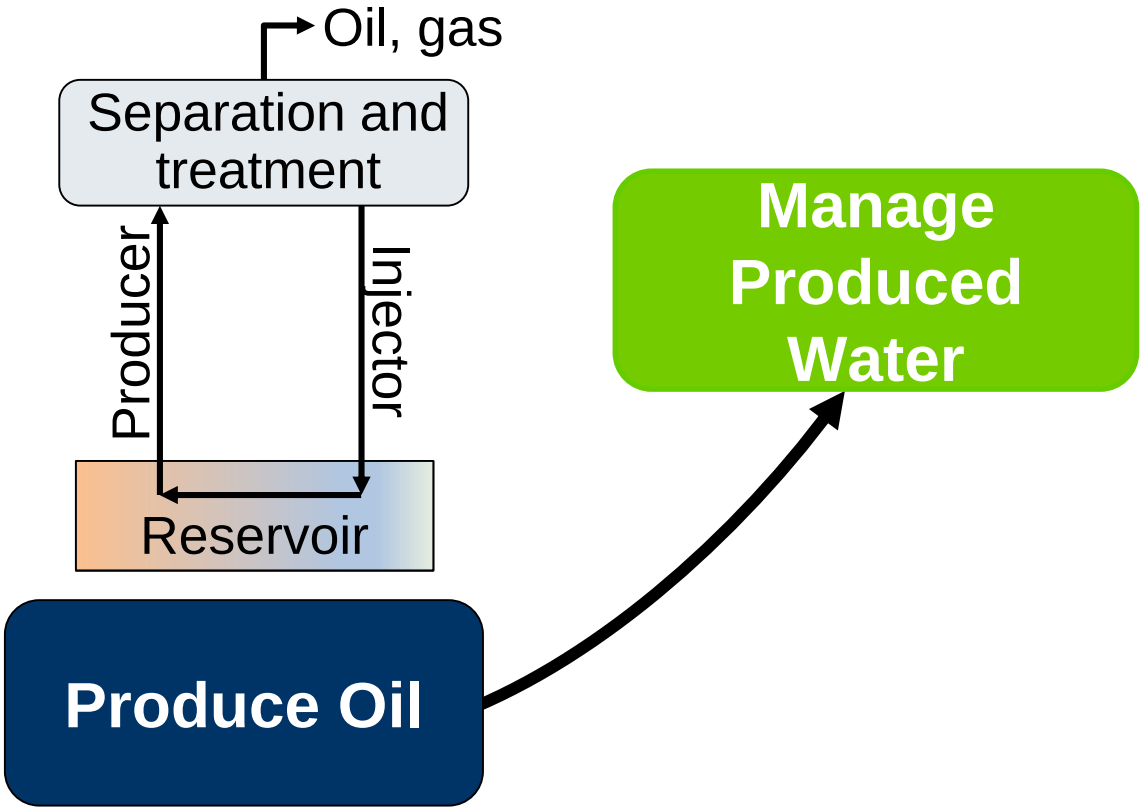
Limits & Strengths of the NSF-Technology Revealed by a Long Term Field Test

ETT-W Water Treatment Technology – Roland Albustin & Martin Datler

Muscat - Oman, 23. October 2019

PRODUCED WATER
MIDDLE EAST 2019

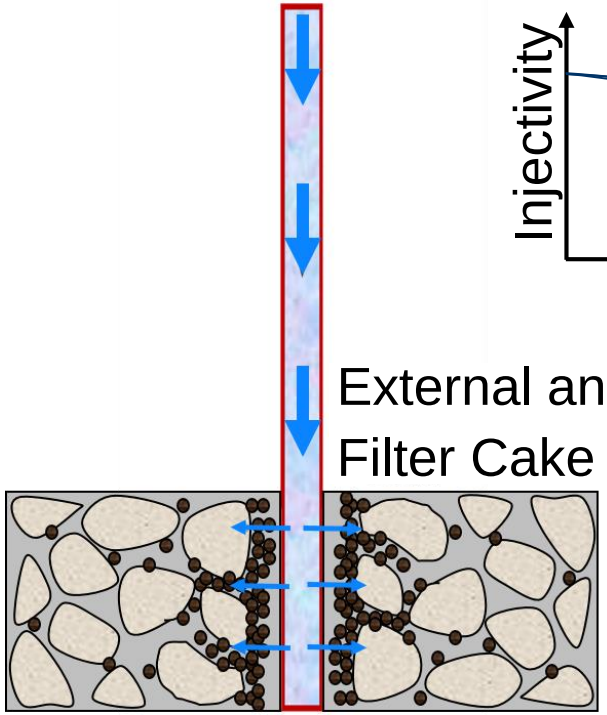
Water and Oil

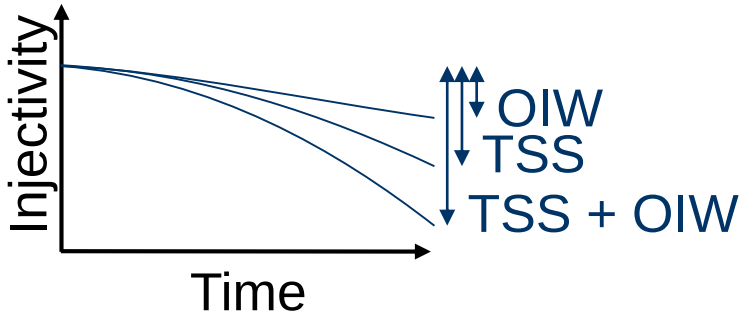


Produced Water Handling

How clean does the water need to be?

How dirty can the water be?





Produced Water Handling

How clean does the water need to be?
How dirty can the water be?

1000 ppm OIW
10 ppm TSS

→

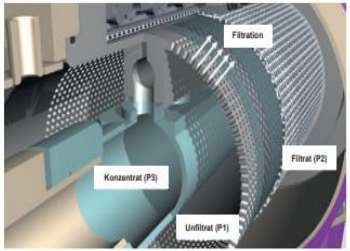
5 ppm OIW
1 ppm TSS

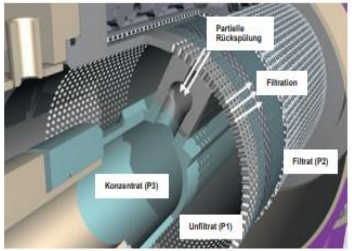
- Formation material
- Scale
- Bacteria
- Corrosion products
- Salt
- Oil
- Chemical precipitates

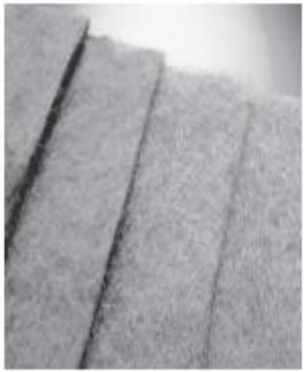
Filter Technologies (used within this project)

Deep Bed Filter – NSF

Mesh – Sieve Filter



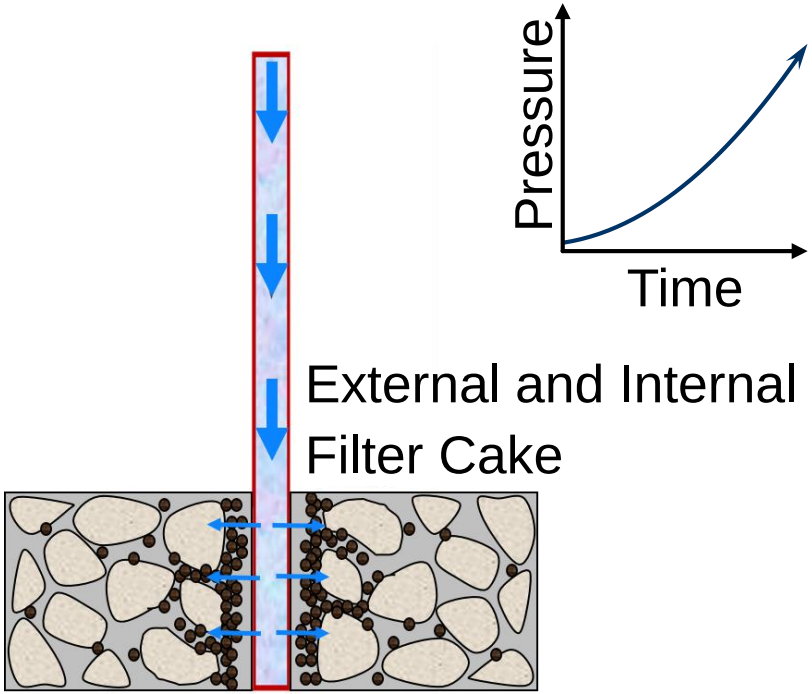




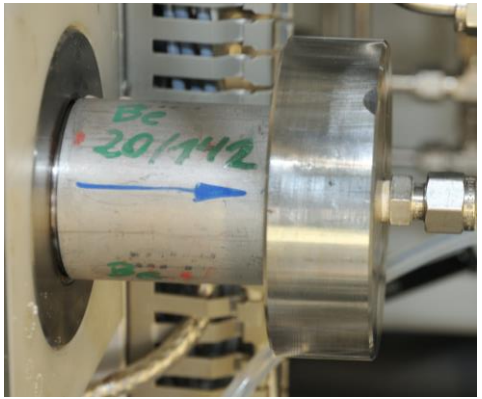
Cartridge – Absolute Filter

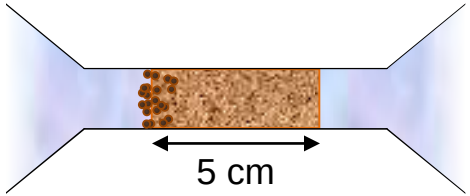
PRT – Pressure Reduction Test

Reservoir

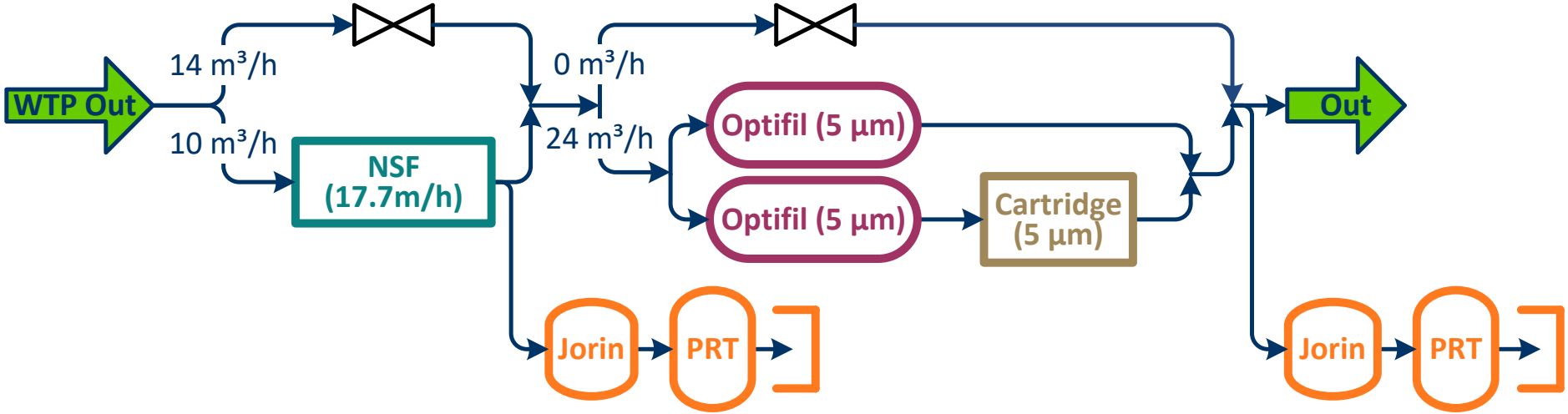


PRT

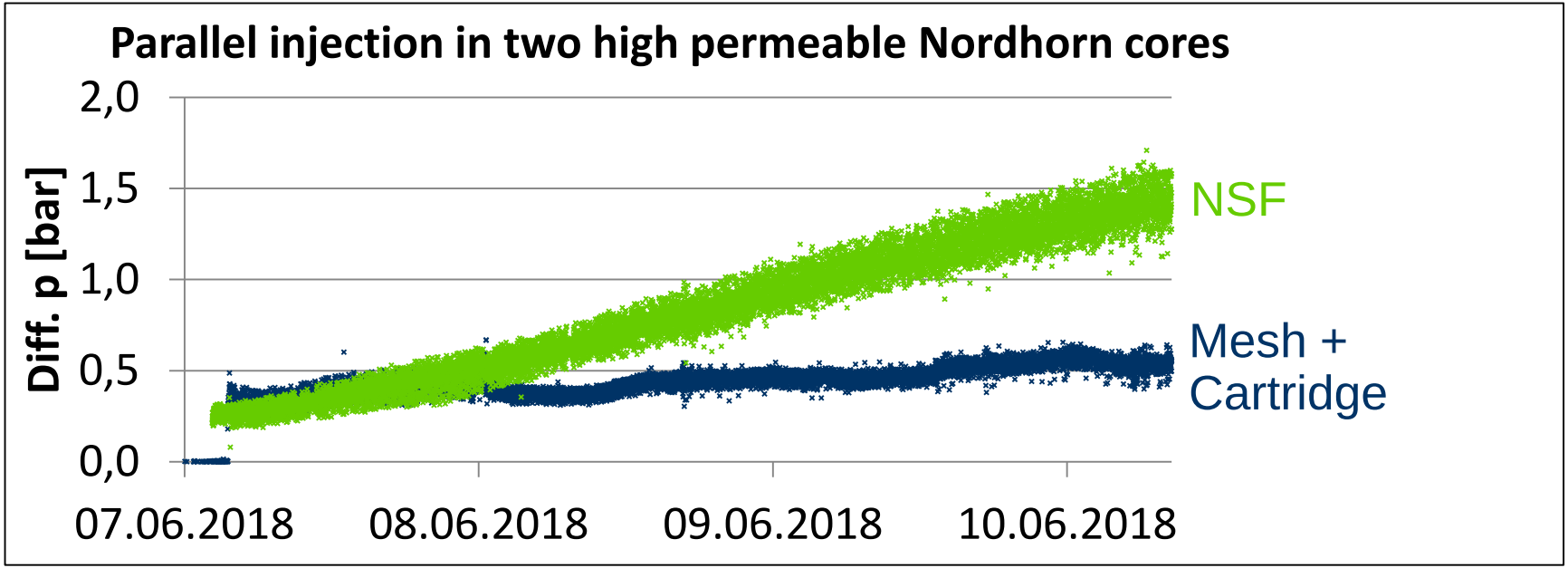




PRT: Outlet NSF vs. Outlet Cartridge



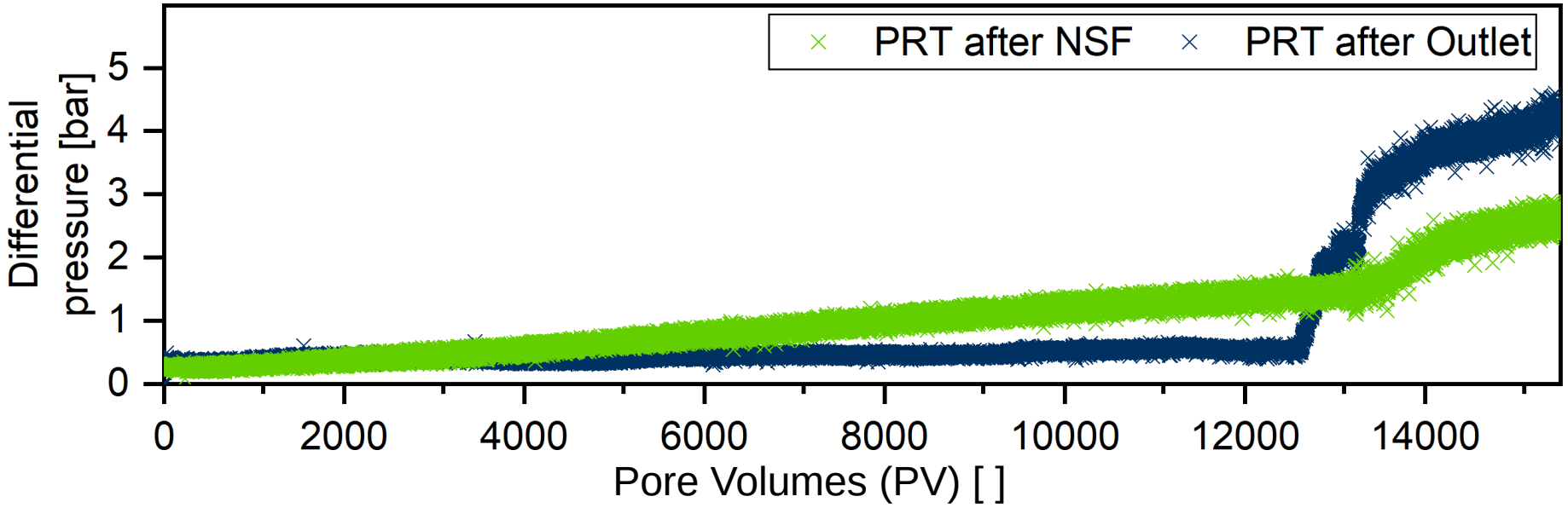
PRT: Outlet NSF vs. Outlet Cartridge



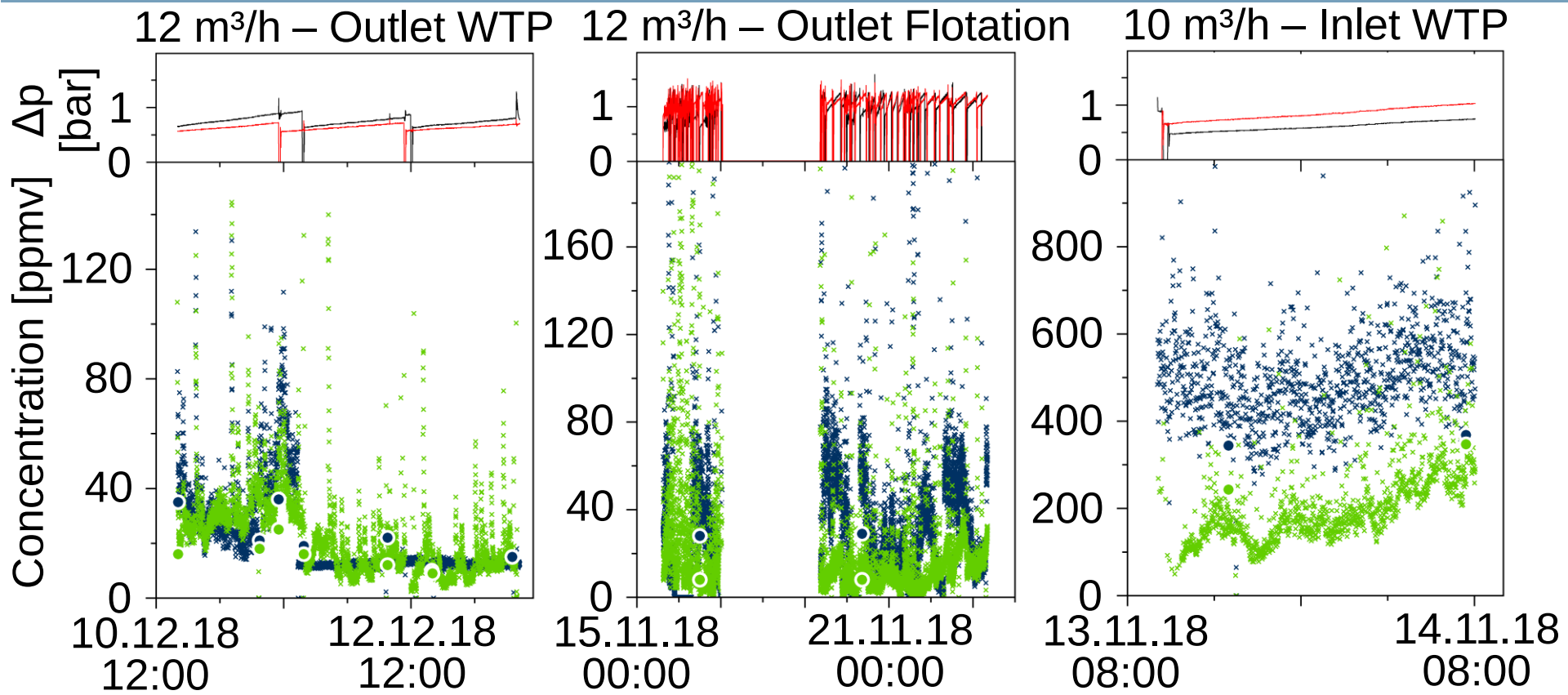
PRT: Outlet NSF vs. Outlet Cartridge

Findings

- Importance of Performance and Reliability

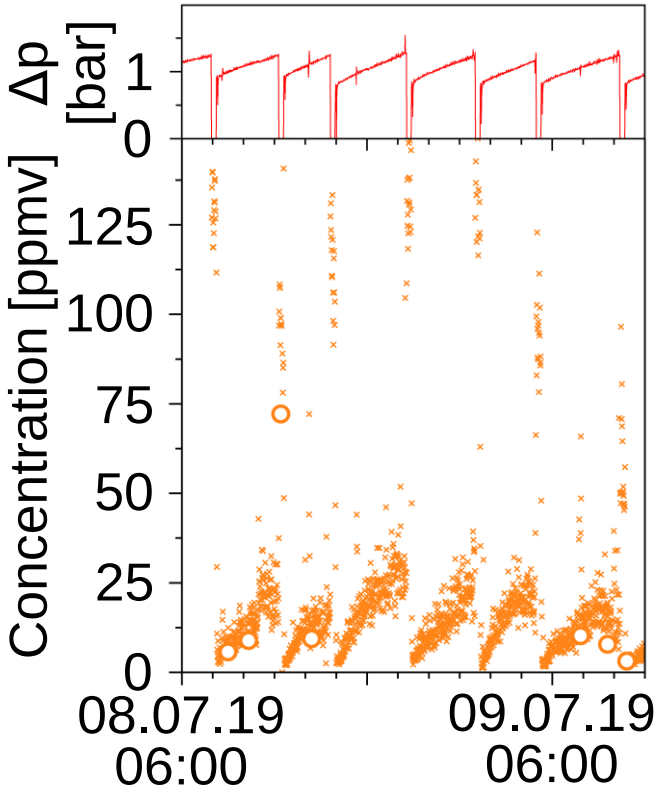


Inlet Quality Influences NSF Performance



The Mobilisation of Slugs

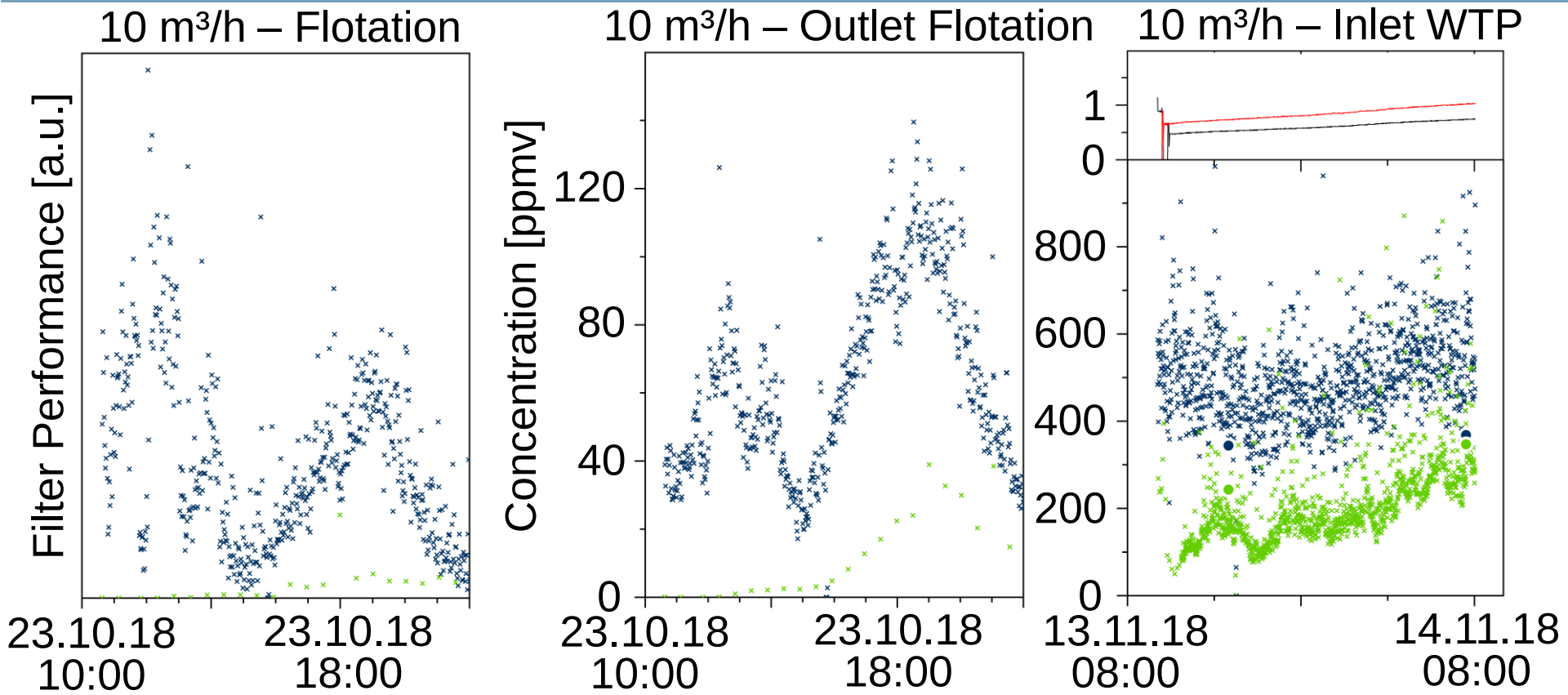
12 m³/h – Outlet Chemical Flotation



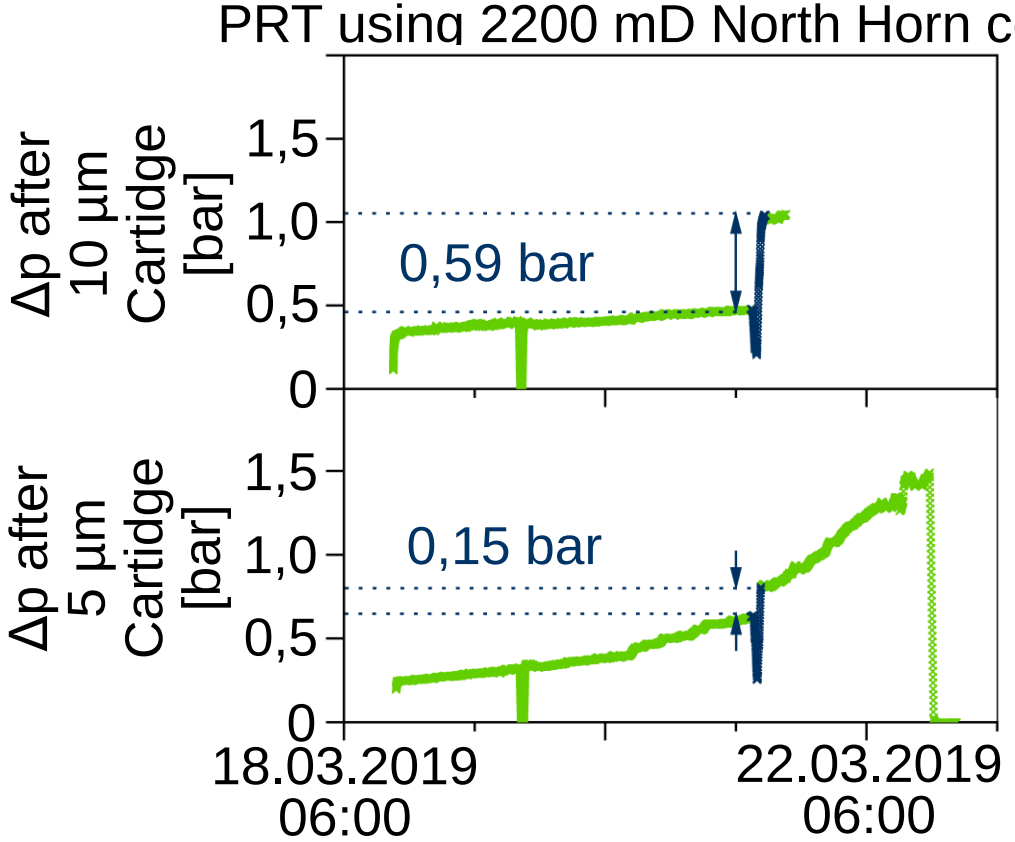
Findings

- Interaction of filter material with flocculant
- Each backwash initiate a OIW-peak at the outlet of the filter

Slugs and Loading Time



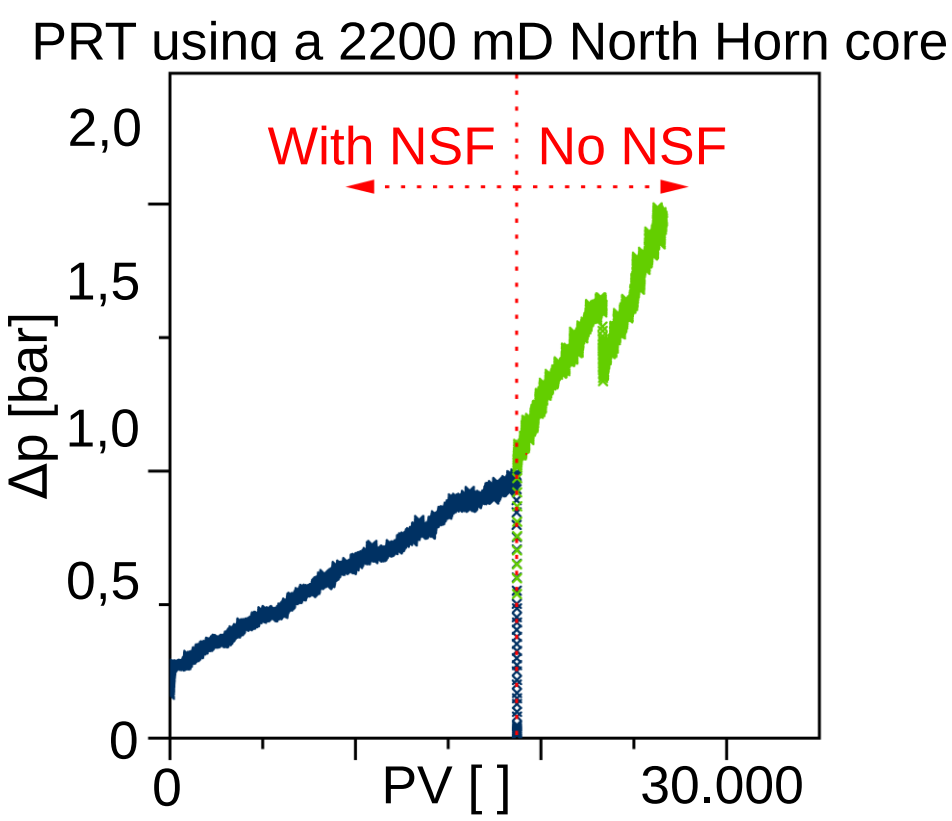
Injectivity, Slugs and Cartridge Filters



Findings

- 5 µm cartridges can filter the slug…
- … at least better than a 10 µm cartridges.

Injectivity and NSF



Findings

- Like expected, the NSF significantly improves the injectivity
- OIW Outlet NSF: 35 ppm (average)
- OIW Inlet NSF: 140 ppm (average)
- Shutdown causes temporary improvement

NSF Backwash Water Treatment

Sample 1 after 24 h:

Clear phase separation

Sample 2 after 2 h:

Still good phase separation

Adding petroleum ether:

Sludge does not mix with other phases

4 Samples	Average TSS [%]
Sediments	0,0
Water phase	1,3
Flotation slug	98,7

Treating NSF Backwash Water Offshore

Pilot

water handling capacity: 12 m³/h

- 2 m³/Backwash
- 8 m³/day (8% of treated water)
- 240 m³/month
- 2.920 m³/year

Treating NSF Backwash Water Offshore

Scenario:
20.000 bopd @ 50% Water cut

water handling capacity: 120 m³/h

- 20 m³/Backwash = ½ Pool
- 80 m³/day = 2 Pools
- 2.400 m³/month = 1 ITC
- 29.200 m³/year = 1 Tanker (170 m x 25 m)

Conclusions

- Each Backwash can mobilise slugs.
- The deep bed filter (NSF) has a better operability than mesh (5 µm) but the best injectivity was achieved using an absolute filter.
- Cartridges bear the risk of high OPEX due to unpredictable (fast) blocking.
- A NSF can provide an accaptable water quality and good injectivity as long as it is operated within specification.
- Each slug can have a different origin and thus also a different composition and impact on the system.
- Backwash water handling needs to be considered (especially offshore adapting the infrastructure is cost intensive).
- Many parameters influence the injectivity (not only OIW & TSS).

Q & A

Contact

OMV Upstream
Trabrennstrasse 6-8
1020 Vienna
Austria

Roland.Albustin@omv.com
Martin.Datler@omv.com
www.omv.com
www.omv.com/socialmedia

Legal Disclaimer

This presentation is prepared in order to outline our expression of interest. Nothing in this presentation shall be construed to create any legally binding obligations on any of the parties. Neither party shall be obligated to execute any agreement or otherwise enter into, complete or affect any transaction in relation to this presentation.

All figures and information in this presentation are strictly confidential, they are by no means binding and thus indicative only.

TECHNOLOGY
Identify | Develop | Pilot | Deploy

OMV

Limits & Strengths of the NSF-Technology Revealed by a Long Term Field Test

ETT-W Water Treatment Technology – Roland Albustin & Martin Datler

Muscat - Oman, 23. October 2019

PRODUCED WATER
MIDDLE EAST 2019