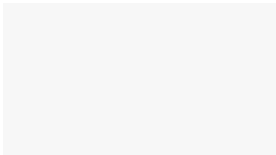


The *NewPacs* System Results and Reference Sites

 Nemo Ltd



The *NewPacs* System / Reference sites

City of Mikkeli, Finland, commercial agreement for disinfection of effluent waste water



Feeding points in final sedimentation in piloting the *NewPacs* System in 2010 before commercial phase



Control System installations



Overview of Mikkeli WWTP

Results from full scale process in Mikkeli, Finland

- Water quality after *NewPacs* treatment

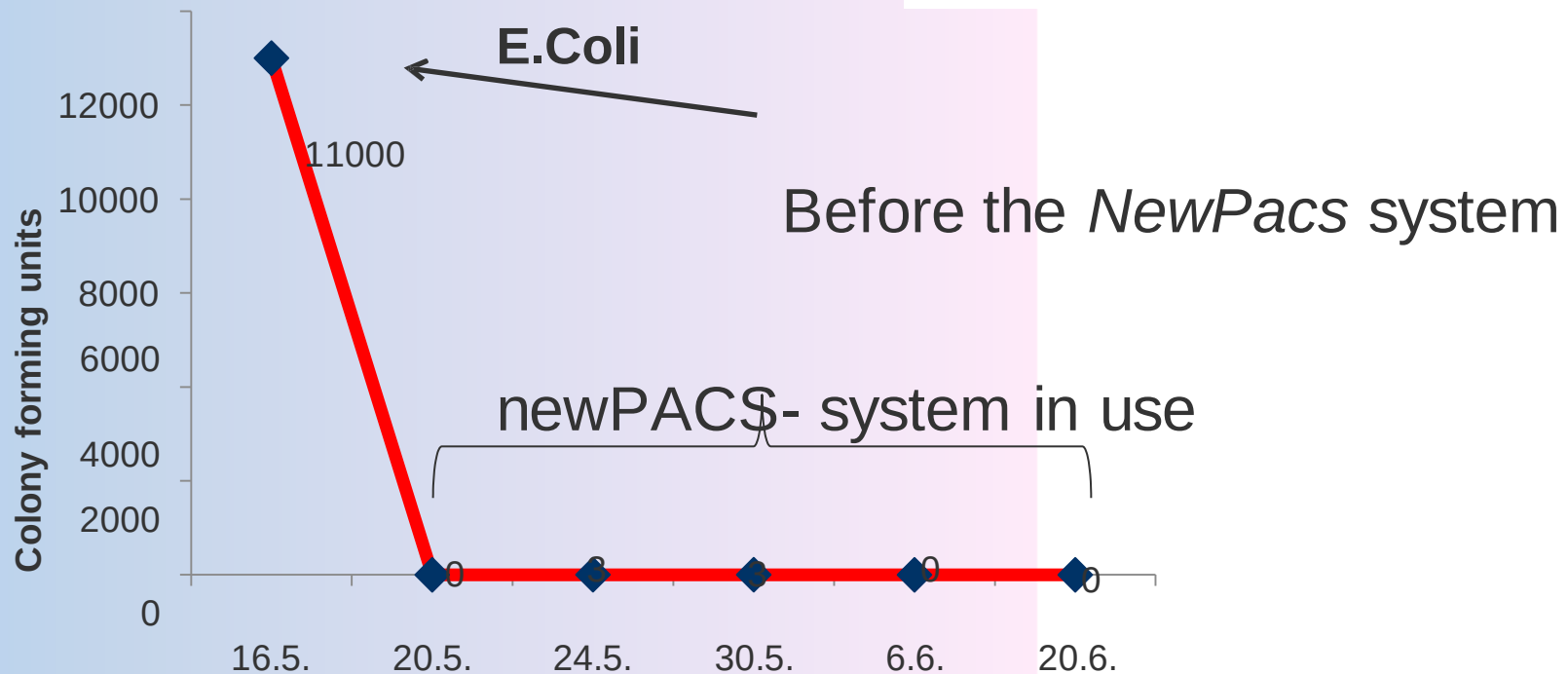
Parameter	Result
E.Coli	< 1 cfu / 100 ml
Faecal coliforms	3 cfu / 100 ml
BOD7	2,1 mg/l
COD	33 mg/l

- Analyzed by:



(independent
laboratory)

Results from full scale process in Mikkeli, Finland, continued



The *NewPacs* System / Reference sites

NewPacs Disinfection Demonstration, St. Petersburg Kronstadt Waste Water Treatment Plant

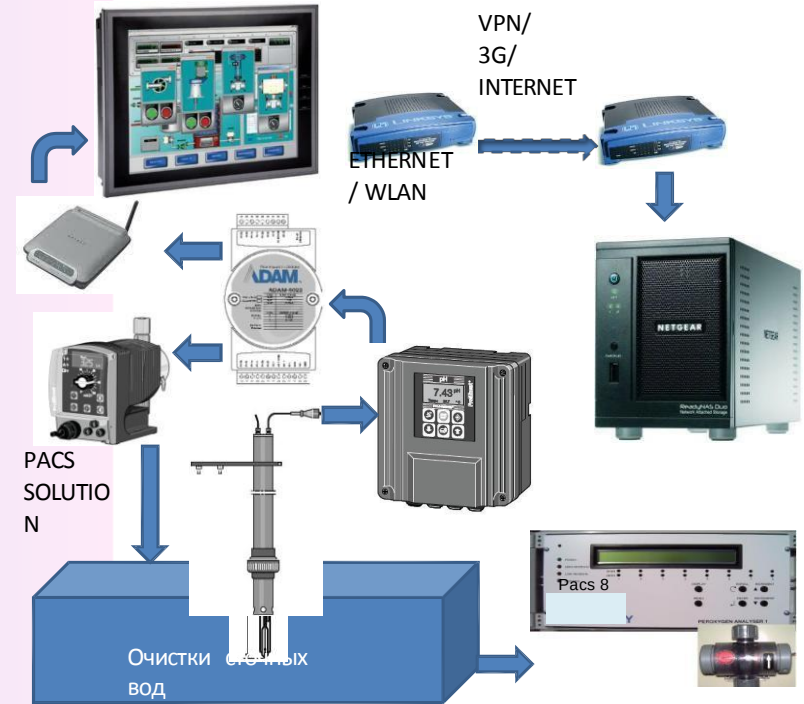
Waste water flow ca 20.000 m³/d

Main goals from customer for coliforms:

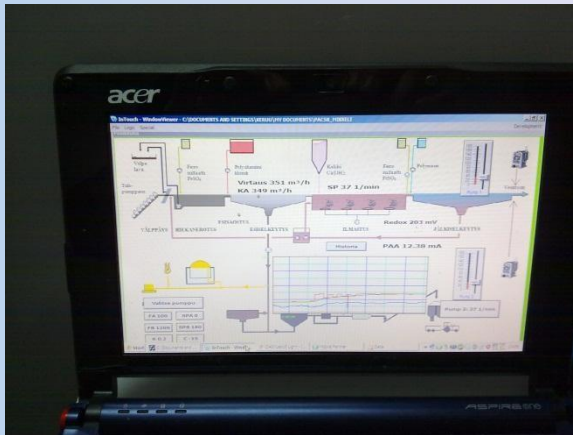
- TCB (Total coliform bacteria, CFU/100cm³), target not more than 500
- TTCB (Thermotolerant coliform bacteria, CFU/100cm³), target not more than 100

NewPacs Disinfection Demonstration, St. Petersburg Kronstadt Waste Water Treatment Plant

Feeding point
for the chemical



System operator
PC and interface



NewPacs system control, data logging
and remote control

Disinfection Demonstration, St. Petersburg Kronstadt Waste Water Treatment Plant

Microbiological results of the *NewPacs* treatment

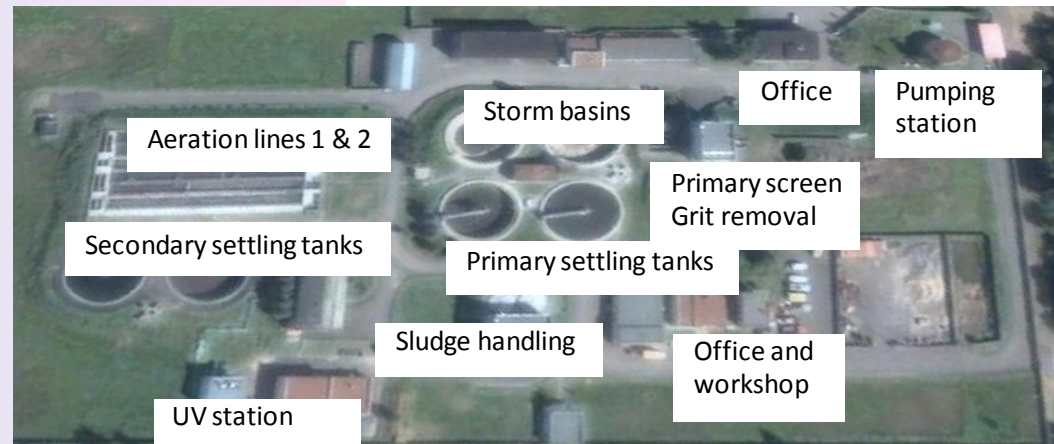
Date	TCB	TTCB
18.11.10		
23.11.10	99.82 %	99.82 %
25.11.10	99.82 %	99.82 %
30.11.10	96.96 %	97.34 %
02.12.10	99.92 %	99.93 %
07.12.10	99.96 %	99.96 %
09.12.10	99.97 %	99.97 %
14.12.10	32.48 %	37.98 %
16.12.10	99.93 %	99.94 %
21.12.10	99.79 %	99.78 %
23.12.10	99.82 %	99.76 %
28.12.10	99.00 %	99.04 %
30.12.10		
10.2.2011	99.21 %	99.23 %
10.2.2011	84.56 %	87.09 %
10.2.2011	99.83 %	99.88 %
10.2.2011	99.68 %	99.67 %
10.2.2011	99.79 %	99.78 %
10.2.2011	99.77 %	99.73 %
10.2.2011	99.79 %	99.81 %
10.2.2011		
17.2.2011		

The *NewPacs* System / Reference sites

Sestroretsk Waste Water Treatment Plant, St. Petersburg, Russia Disinfection demonstration

- Project for renewal of the site and replacing existing UV-system.
- Comparison of methods was needed (UV/NewPacs).

Waste water flow
ca 25.000 m³/d



Sestroretsk, Russia, *NewPacs* disinfection demonstration

**Bacterial colonies
after 3 days incubation**

Effluent water, Sestroretsk, Russia

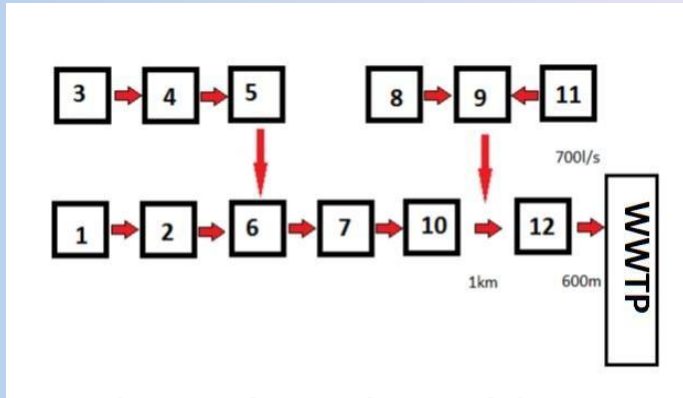
UV OFF PACS OFF	UV ON PACS OFF	UV OFF PACS ON
>300	30+	10-30



The *NewPacs* System / Reference sites

Sorocaba, Brasil, NewPacs odor treatment demonstration

Waste water flow ca 50.000 m³/d



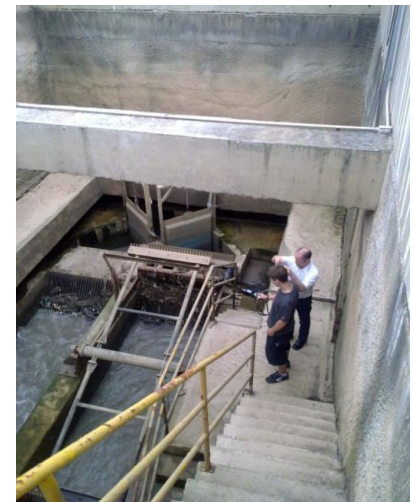
Sorocaba pumping stations and the WWTP.



Chemical delivered to the pumping station



Probe system installed at the pumping station



H₂S and NH₃ measurements were taken at the grit removal of the pumping station

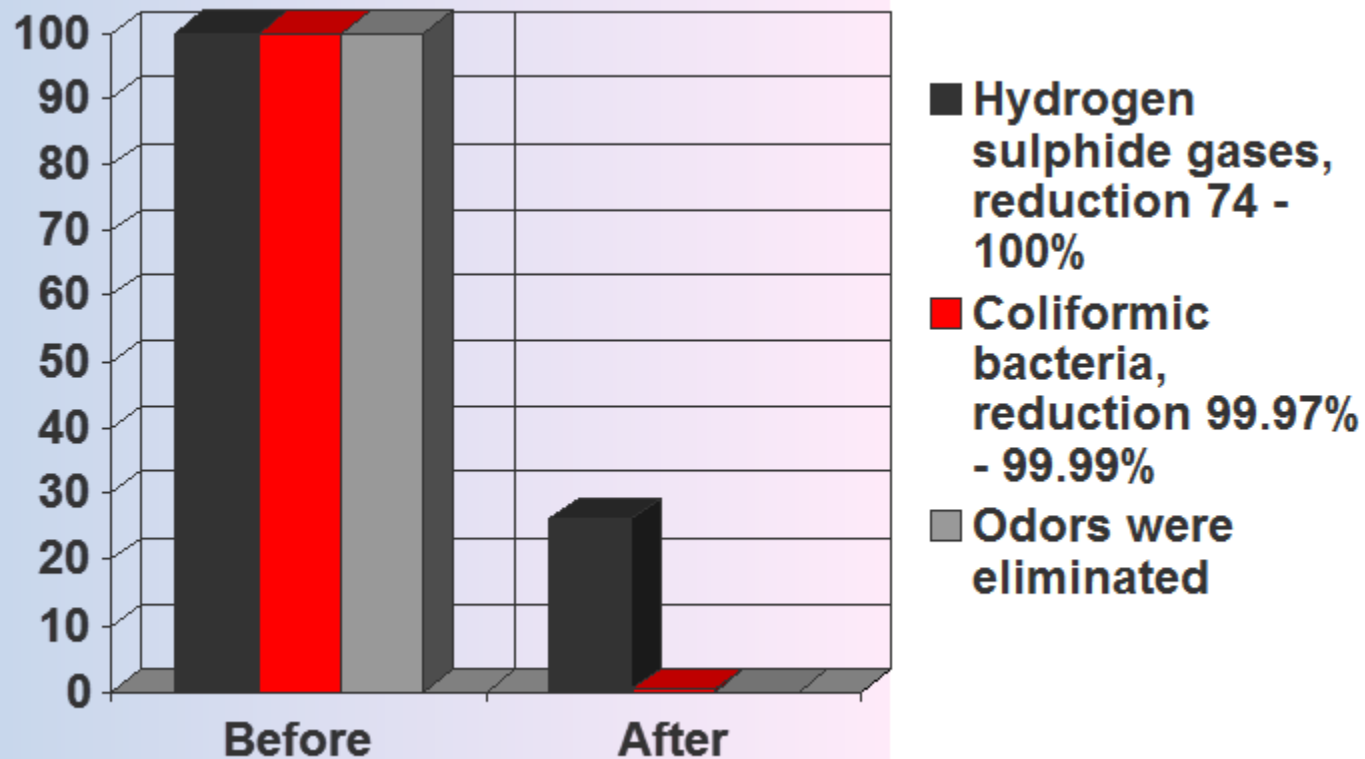
Odour removal at Sorocaba (full scale)

(analyzed in indepent laboratory by waste water plant)

		Pumping Station 12					WWTP					
Date	Time	Well before pumping station 12		Time	Covered influent chamber		Open well with grit removal		Time	Influent chamber at WWTP		Remarks
		NH ₃	H ₂ S		NH ₃	H ₂ S	NH ₃	H ₂ S		NH ₃	H ₂ S	
22.3.2011				8:40			11	4	9:10	16	6	Feeding started at 15:00
28.3.2011				12:00			12	4	12:00	15	4	
29.3.2011				9:30	60	21	11	3	10:00	10	2	
30.3.2011				18:10	40	15	6	0	NewPacs			
31.3.2011	10:00	14	3	10:00	4	0	0	0	11:00	0	0	Heavy rain during the night
	17:45	5	0	17:45	20	6	0	0	14:45	0	0	
1.4.2011	13:50	35	11	13:50	5	0	4	0	18:15	0	0	
4.4.2011	9:25	0	0	9:30	0	0	0	0	10:10	0	0	
	16:05	7	0						16:00	4	0	
5.4.2011				8:45	4	0	0	0				
	11:15	24	7	11:20	4	0	4	0				Feeding stopped at 18:00
6.4.2011	13:10	53	4	13:15	8	0	7	0	12:55	8	0	
7.4.2011	12:25	13	5	12:15	13	4	16	5	12:35	69	25	
8.4.2011	10:20	6	2	10:25	6	1	9	1	10:40	12	4	

The *NewPacs* System / Reference sites

NewPacs results, Hefei, China



The *NewPacs* System / Reference sites

NewPacs results, Tswahne, South-Africa



Faecal coliforms

		14.9.-11		15.9.-11	
	before	after	before	after	
8:00	134 000	330	68 000	2000	
10:00	96 000	50 000	88 000	340	
12:00	108 000	50 000	84 000	320	
14:00	128 000	7600	148 000	680	
Randwater			66 000	2600	
19:45					

		19.9.-11		20.9.-11		21.9.-11	
	before	after	before	after	before	after	
8:00	62 000	680	56 000	170	46 000	140	
10:00	54 000	275	24 000	160	32 000	270	
12:00	66 000	325	56 000	60	38 000	150	
14:00	1 000 000	435	54 000	50	44 000	120	
Randwater	28 000	269	26 000	86	13 000	26	
19:45		40					

1mg/l	4mg/l	6mg/l	7mg/l	8mg/l
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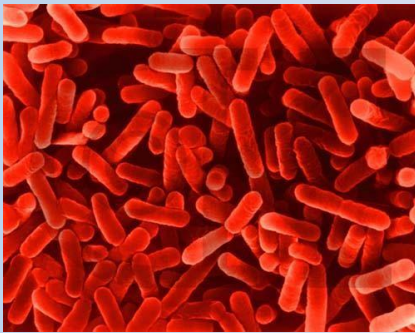
The *NewPacs* System / Reference sites

NewPacs System in drinking water piping disinfection, Virttaa, Finland

- Disinfection of new drinking water pipeline during commissioning to customer
- *NewPacs* role as subcontractor and expert to pipeline supplier
- Disinfection results against e.g. coliforms according to official requirements
- After disinfection, residues from disinfection to local river below safety level, ensured with patented analyser of the *NewPacs* System

The *NewPacs* System / Other References

Results of Laboratory Tests Performed by the National Institute for Health and Welfare



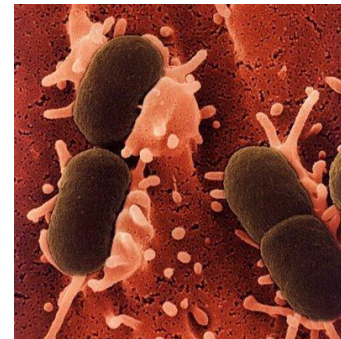
LEGIONELLA

99.9986% reduction



CAMPYLOBACTERIA JEJUNI

99.9984% reduction

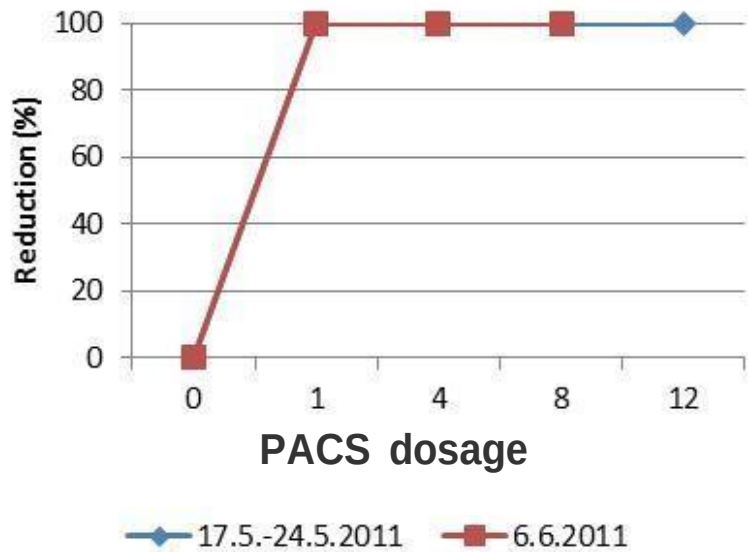


ESCHERICHIA COLI

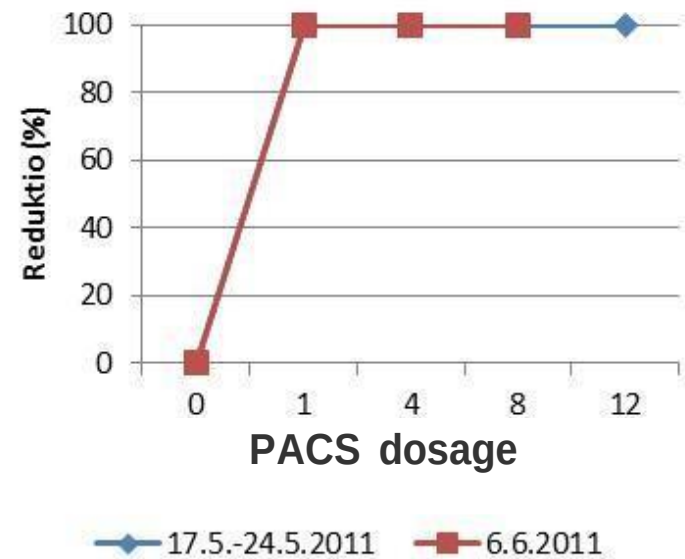
100,00% reduction

Virus post-disinfection results in Oulu, Finland

Faecal coliform bacteria

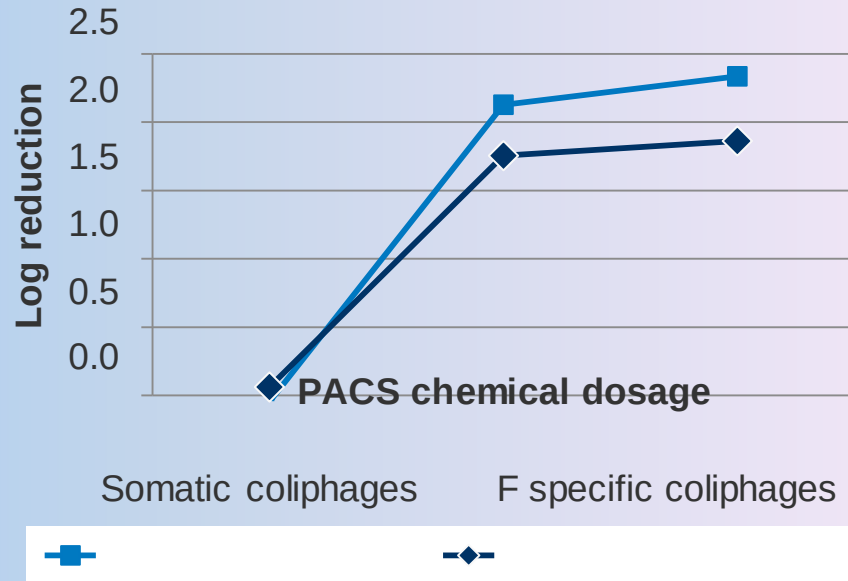


Total coliform bacteria

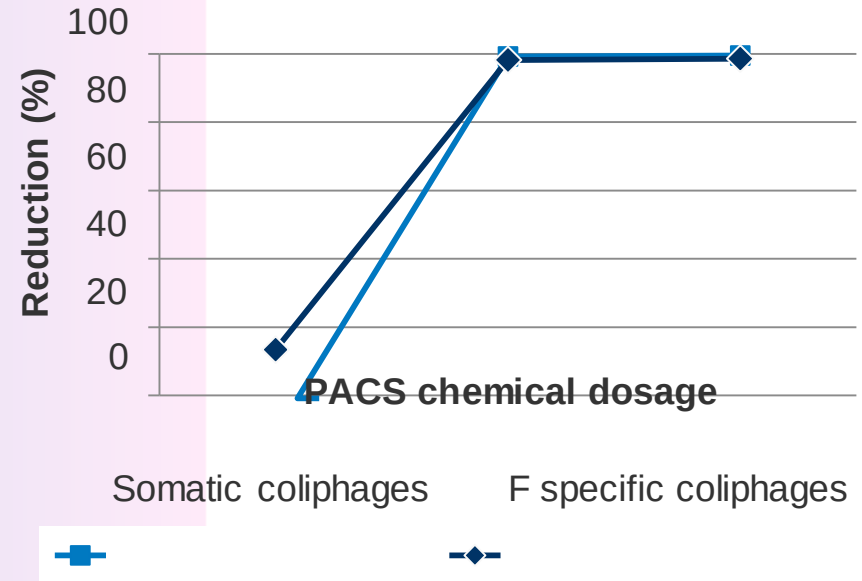


Virus post-disinfection results in Oulu, Finland

coliphages, 30.5.2011



coliphages, 30.5.2011



The *NewPacs* System / Possibilities

1. Raw water treatment

- Odor control
- Safety oxidation
- Breaking of organic material
- Improving sedimentation
- Improving flotation

2. Piping and water reservoir cleaning

- Removal of bio-films

3. Alternative for chlorine chemicals

- Disinfecting chemicals
- Industrial needs

4. Improving waste water treatment

- Odor removal
- Improvement of nitrification
- Boosting of aeration
- Disinfecting of effluent
- Sludge handling
- Heavy metal removal

5. Cleaning of small lakes and rivers