

Pumping out the problems

Wastewater inhibition from portaloo products

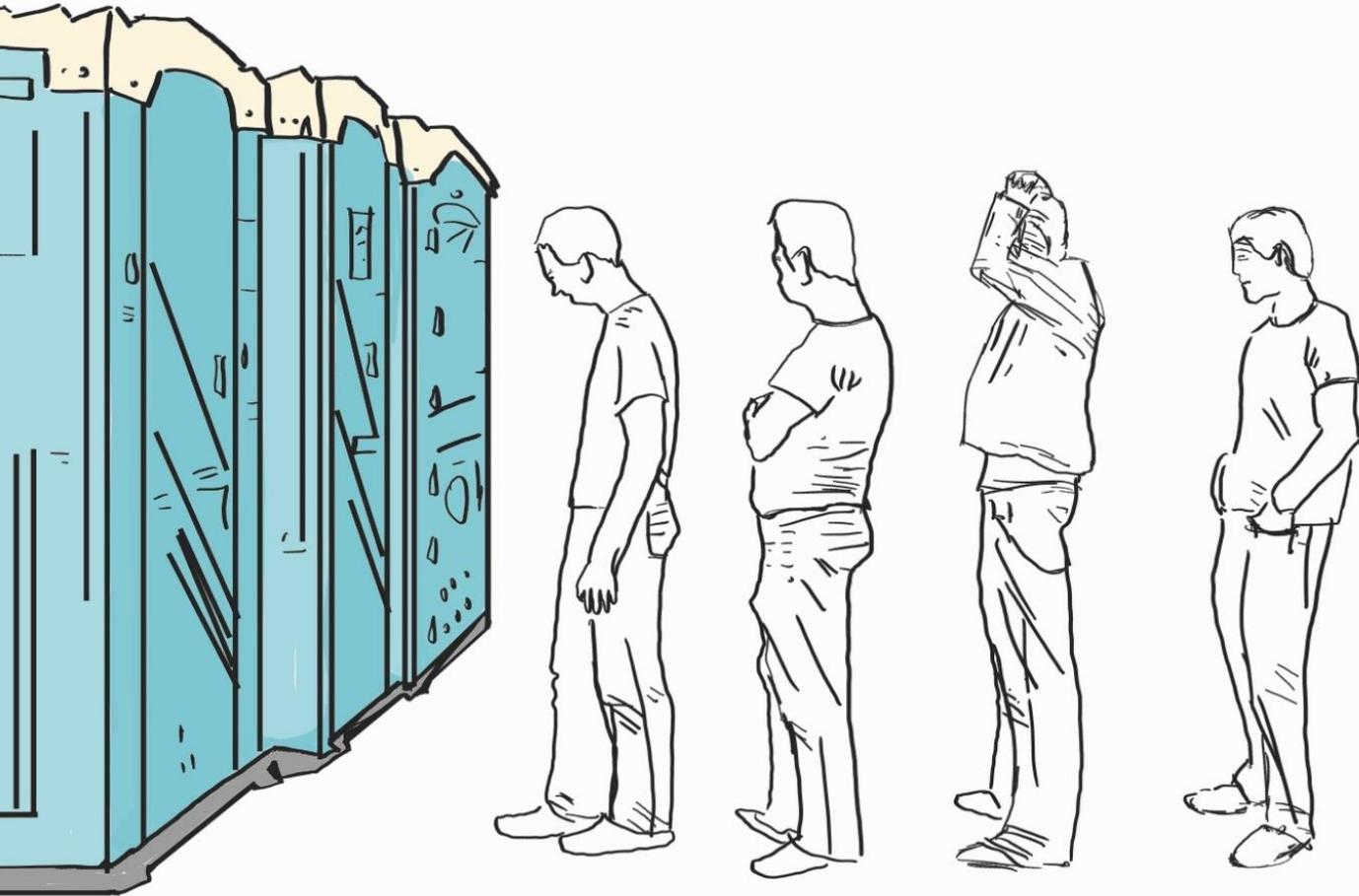


The
Wastewater
Specialists

Optimising your assets

Cady Burns
WaterNZ Conference, 2023,
Wellington

The portaloos



Odour

Load/condition

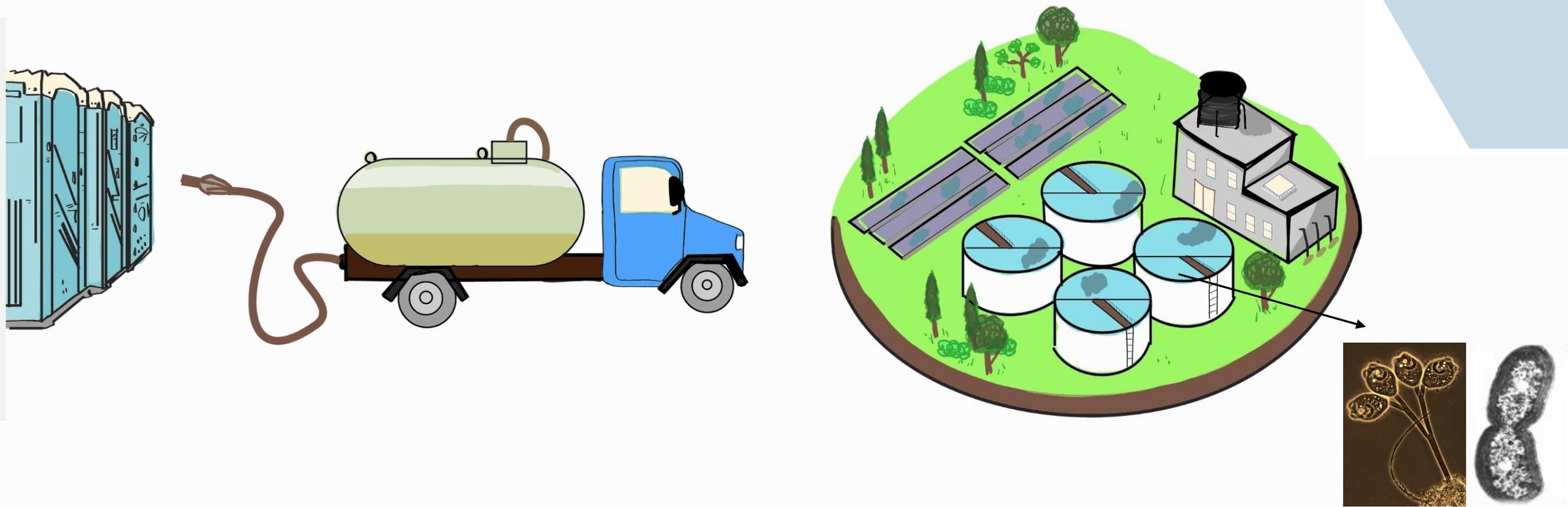
Colour

The products

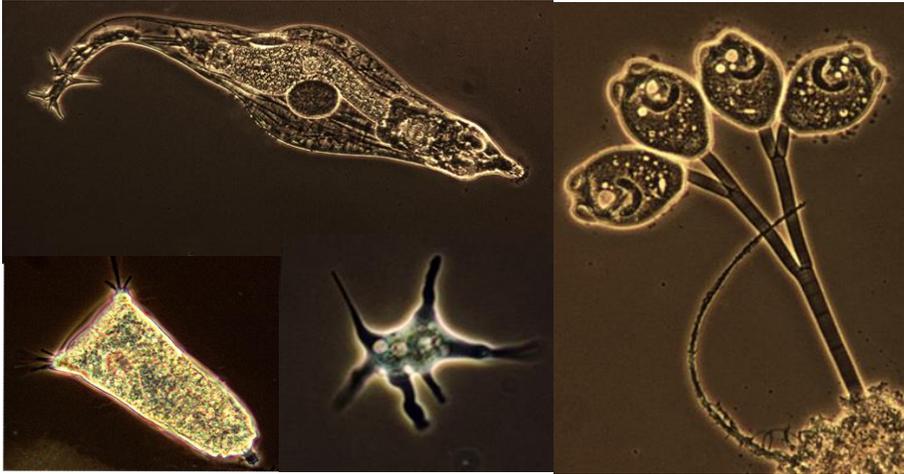


- What is in the products?
- How are these products effecting the biomass?
- How does this impact a WwTP?

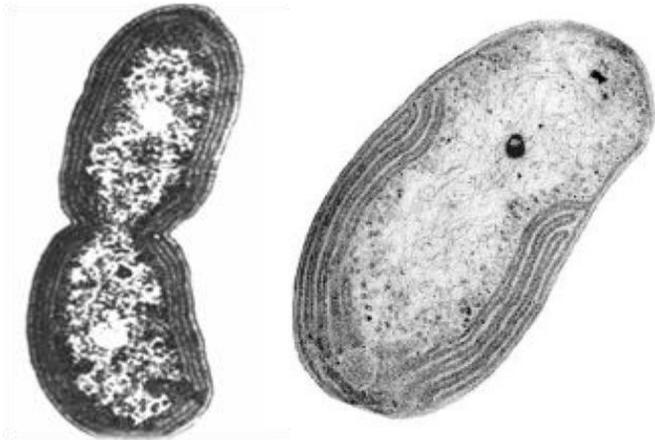
The portaloos process: an overview



The biomass



Heterotrophic biomass

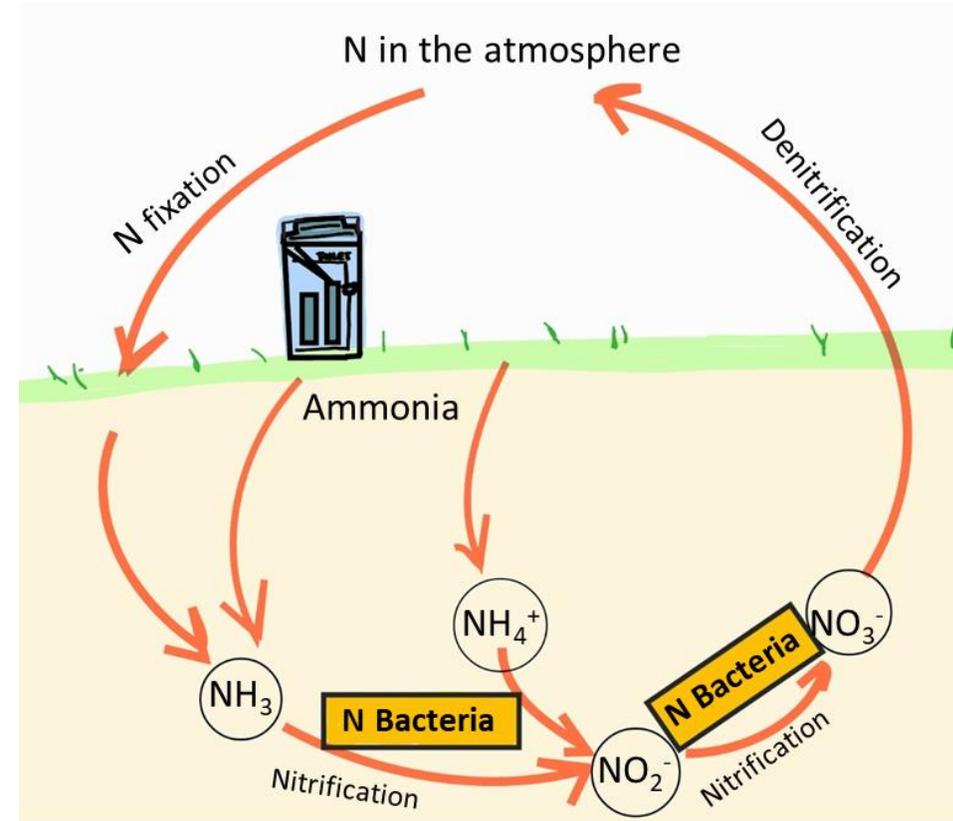


Nitrifying bacteria

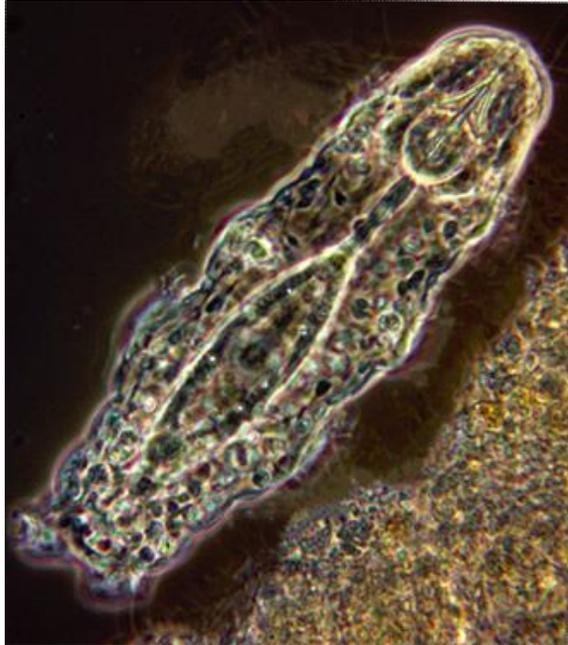
Nitrifying bacteria importance

Ammonia → Nitrite → Nitrate

- Ammonia is toxic to aquatic life
- Regulations require ammonia removal
- Nitrifying bacteria aid this process



Living conditions, a proxy for testing



- The measurement of oxygen consumption
- Determines activity
- Allows for measured inhibition

What is being done What could be done?



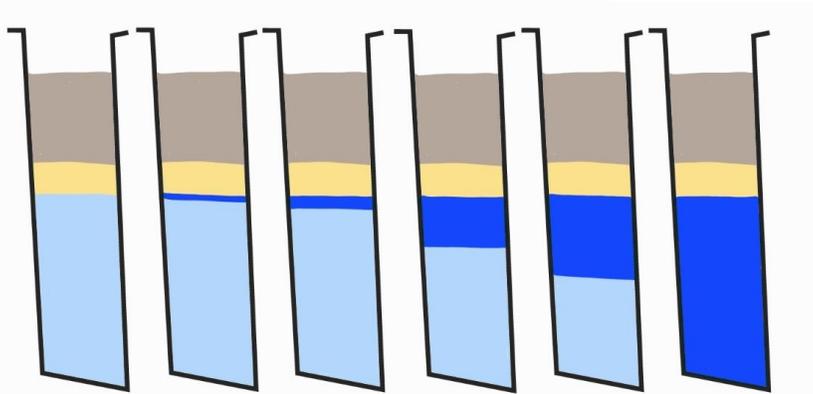
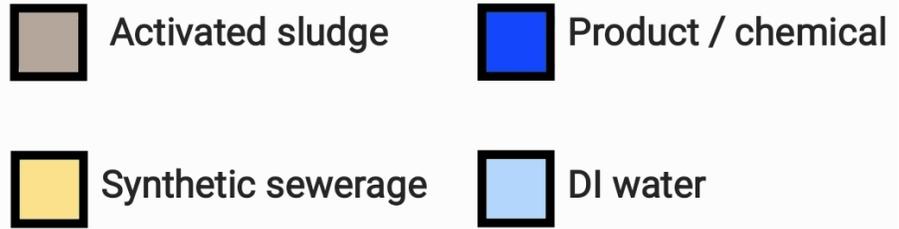
- Specific characteristics
- Manage potential toxic inputs
- Toxicity towards the biomass is poorly understood
- Monitoring → Toxicity testing
 - Optimal effectiveness

The portaloos project

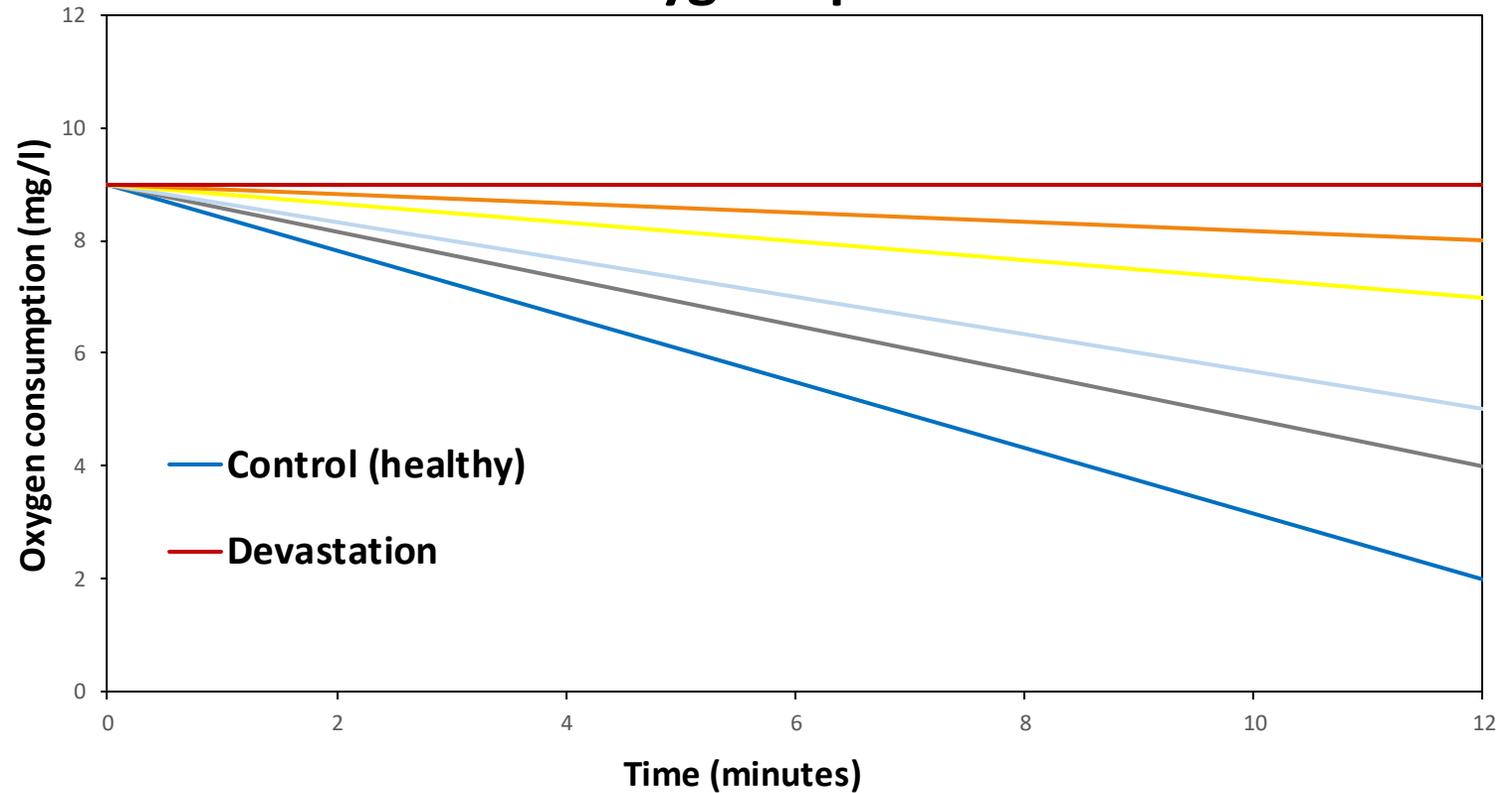


- Engaged with 50 portaloos operators
 - 32 participants
 - Understanding operations, products
- Tested nine products at manufactures dilutions
- Tested at least three times over separate days

Respiration based toxicity testing

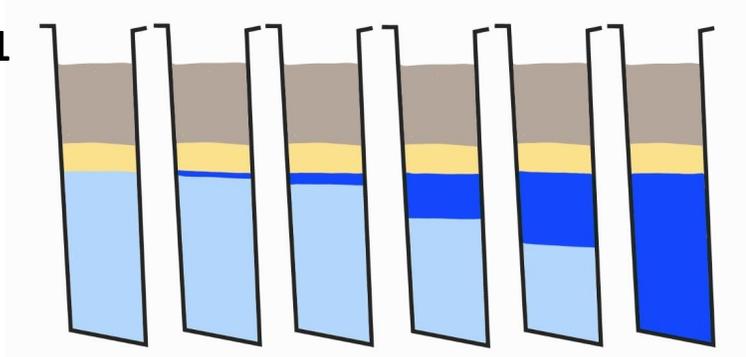


Oxygen uptake



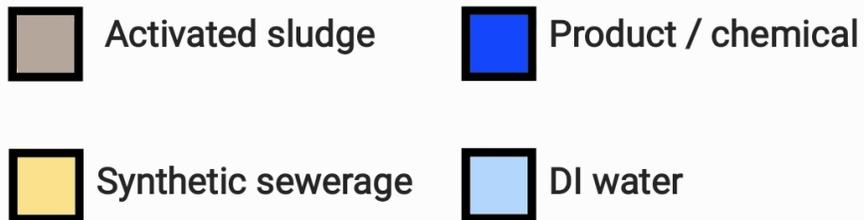
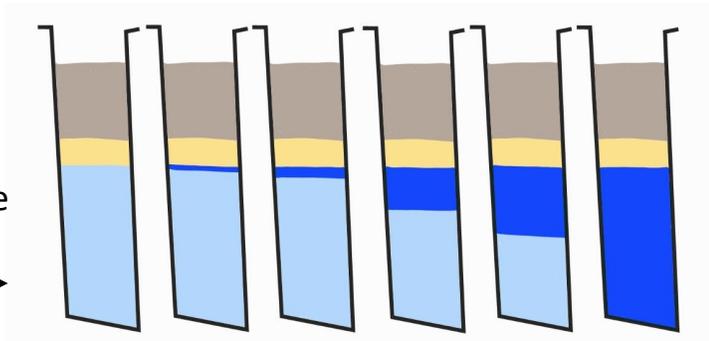
Method

Test part 1

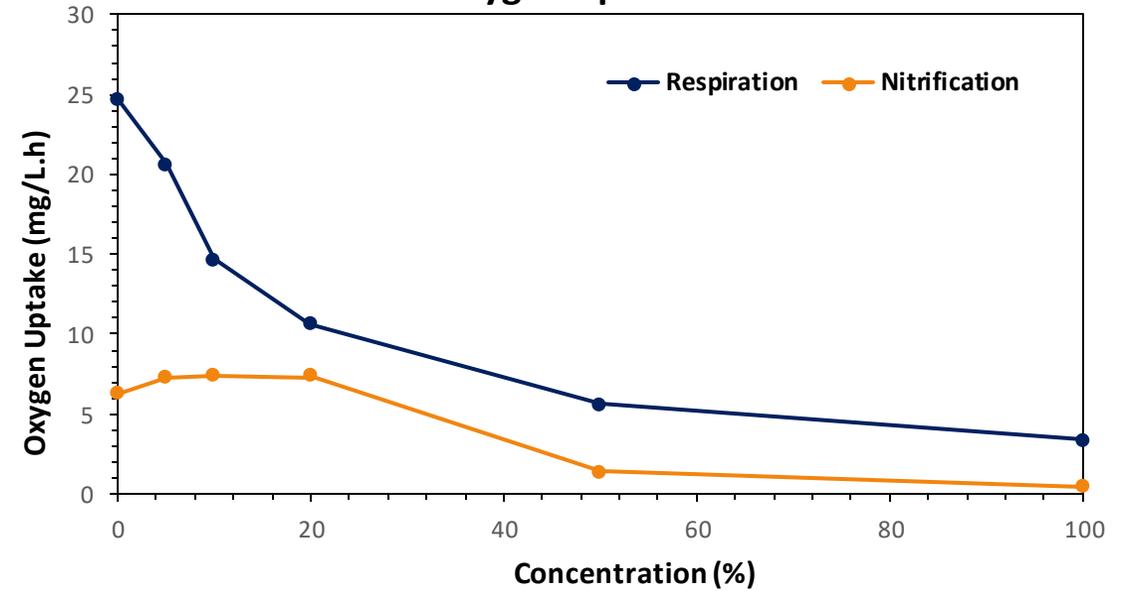


Test part 2

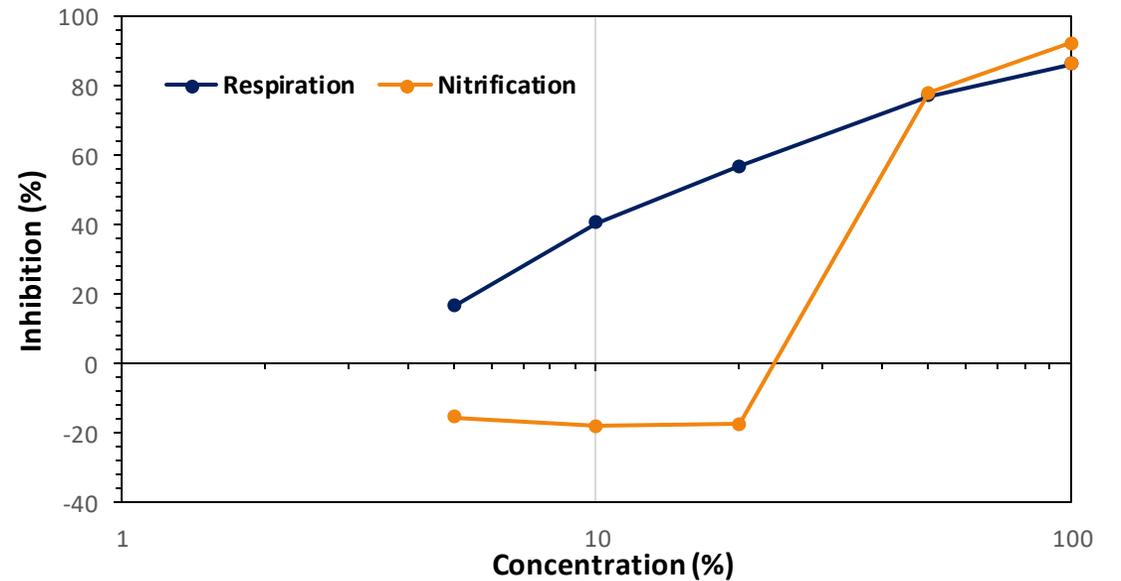
ATU added to the activated sludge



Oxygen uptake

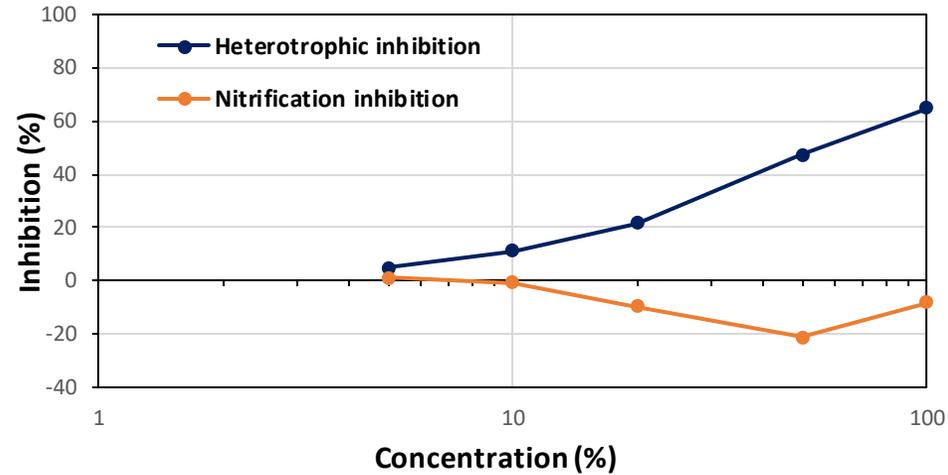


Inhibition

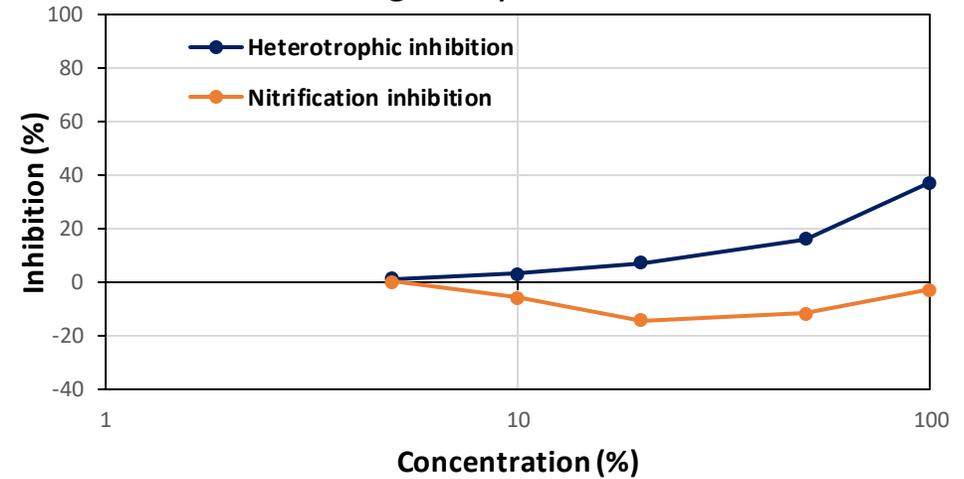


Results: Interesting finds

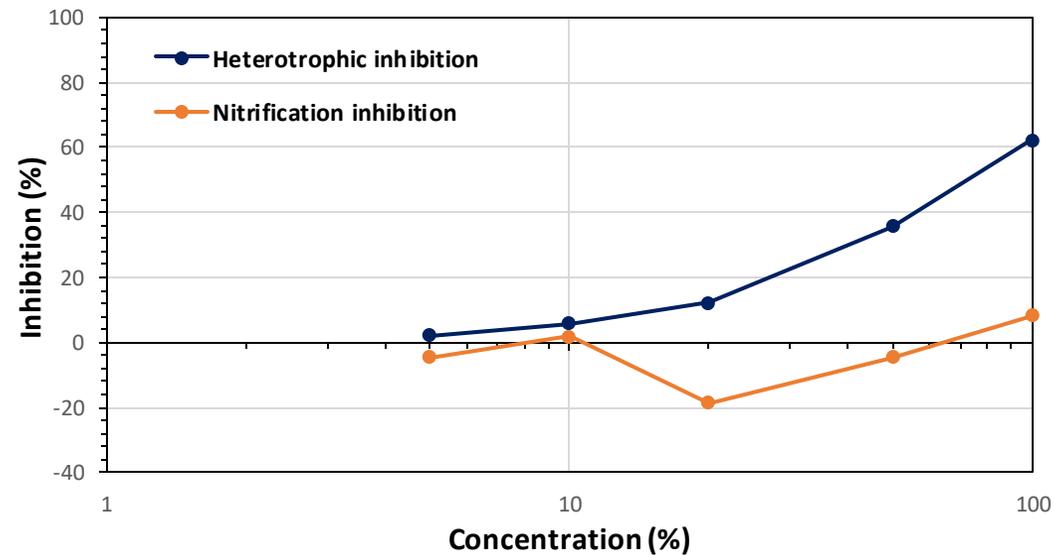
Average Walex Porta-Pak inhibition curve



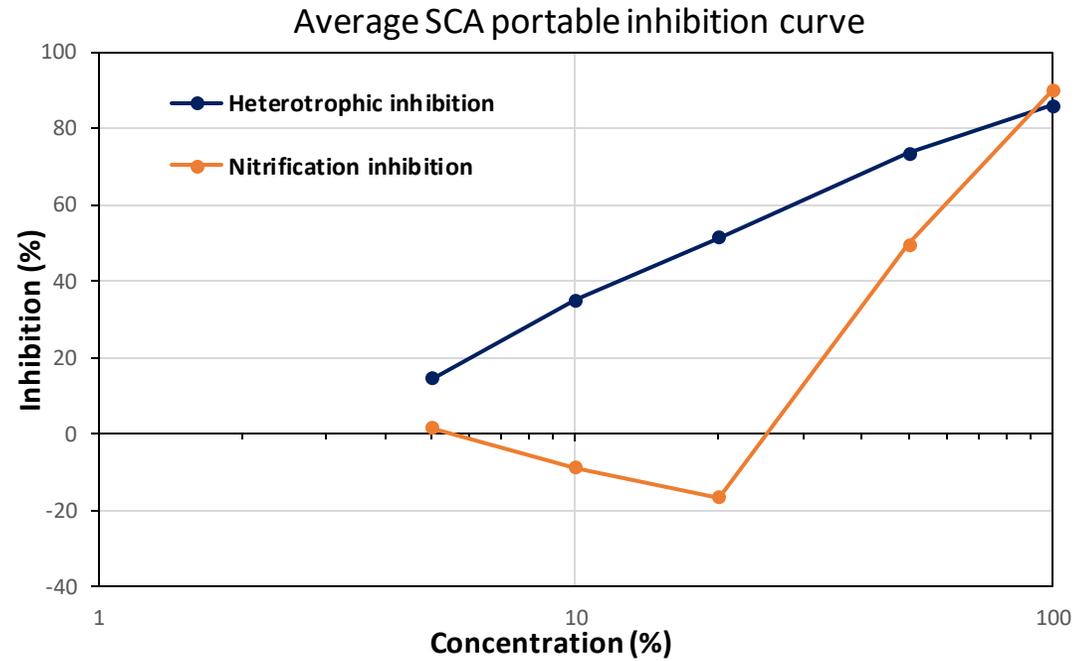
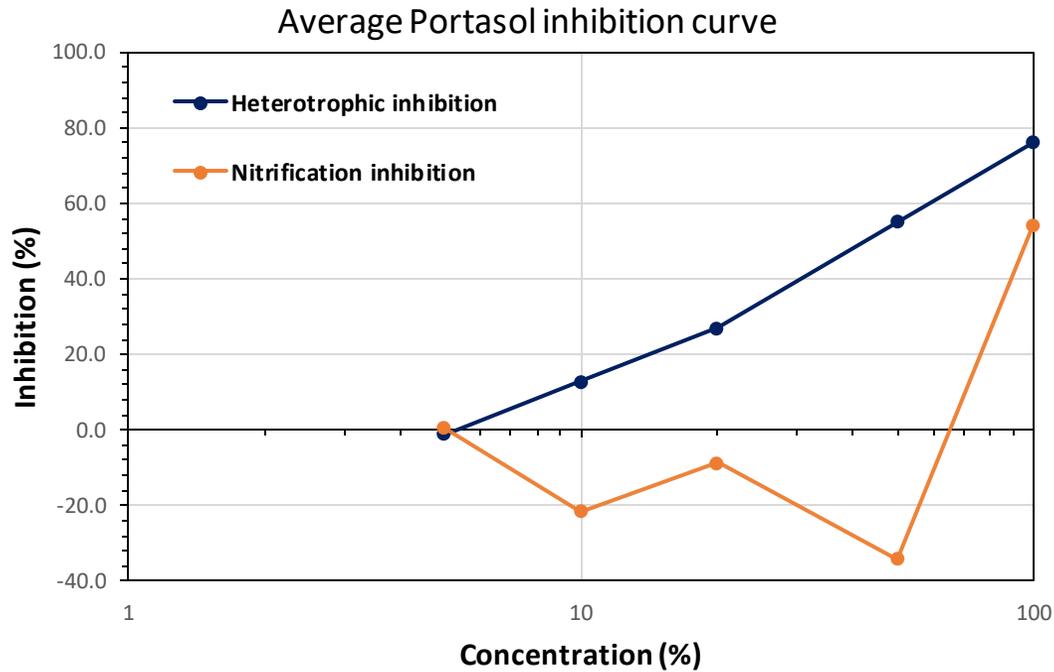
Average Poly Blue Plus inhibition curve



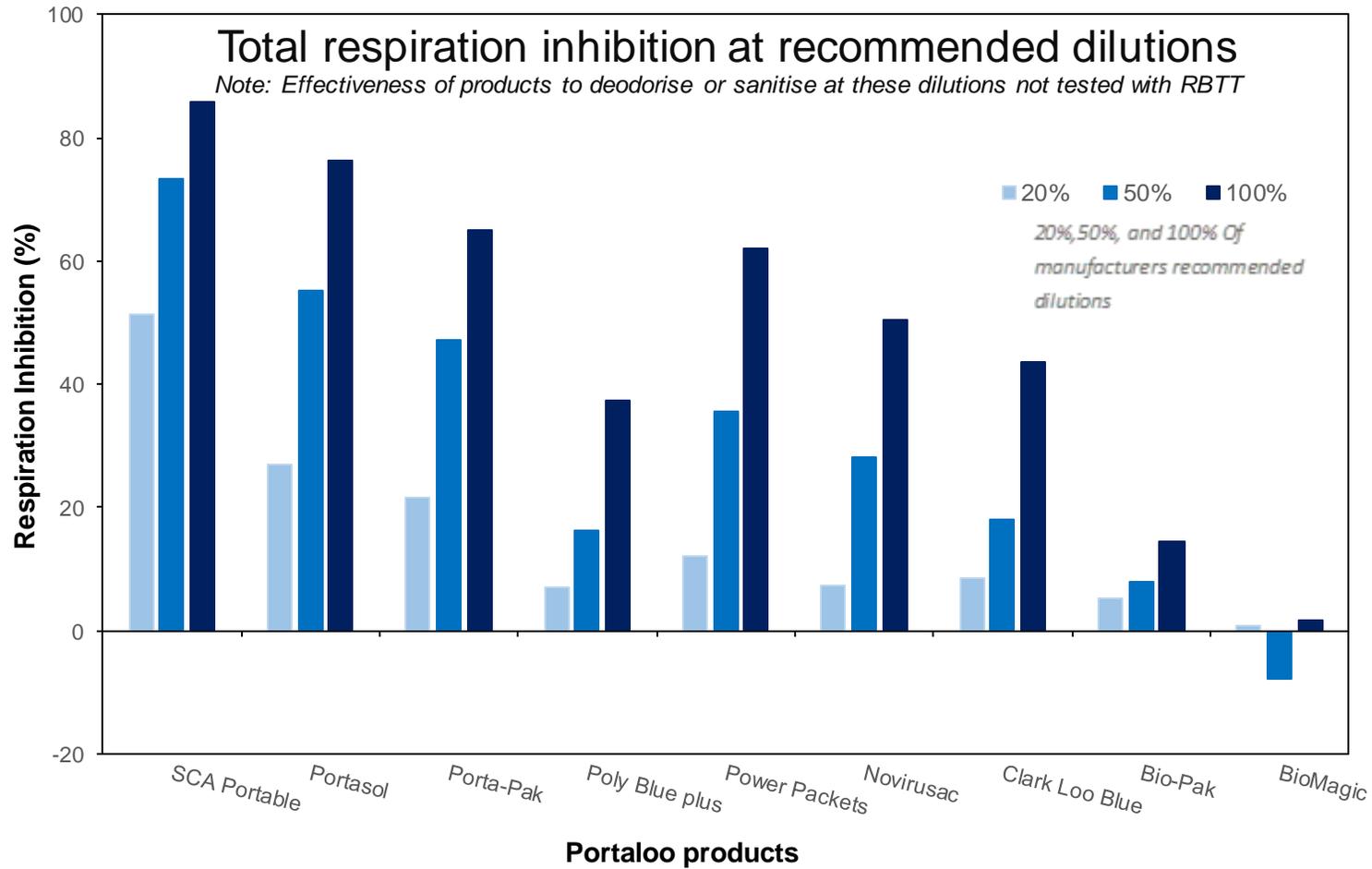
Average Power Packets inhibition curve



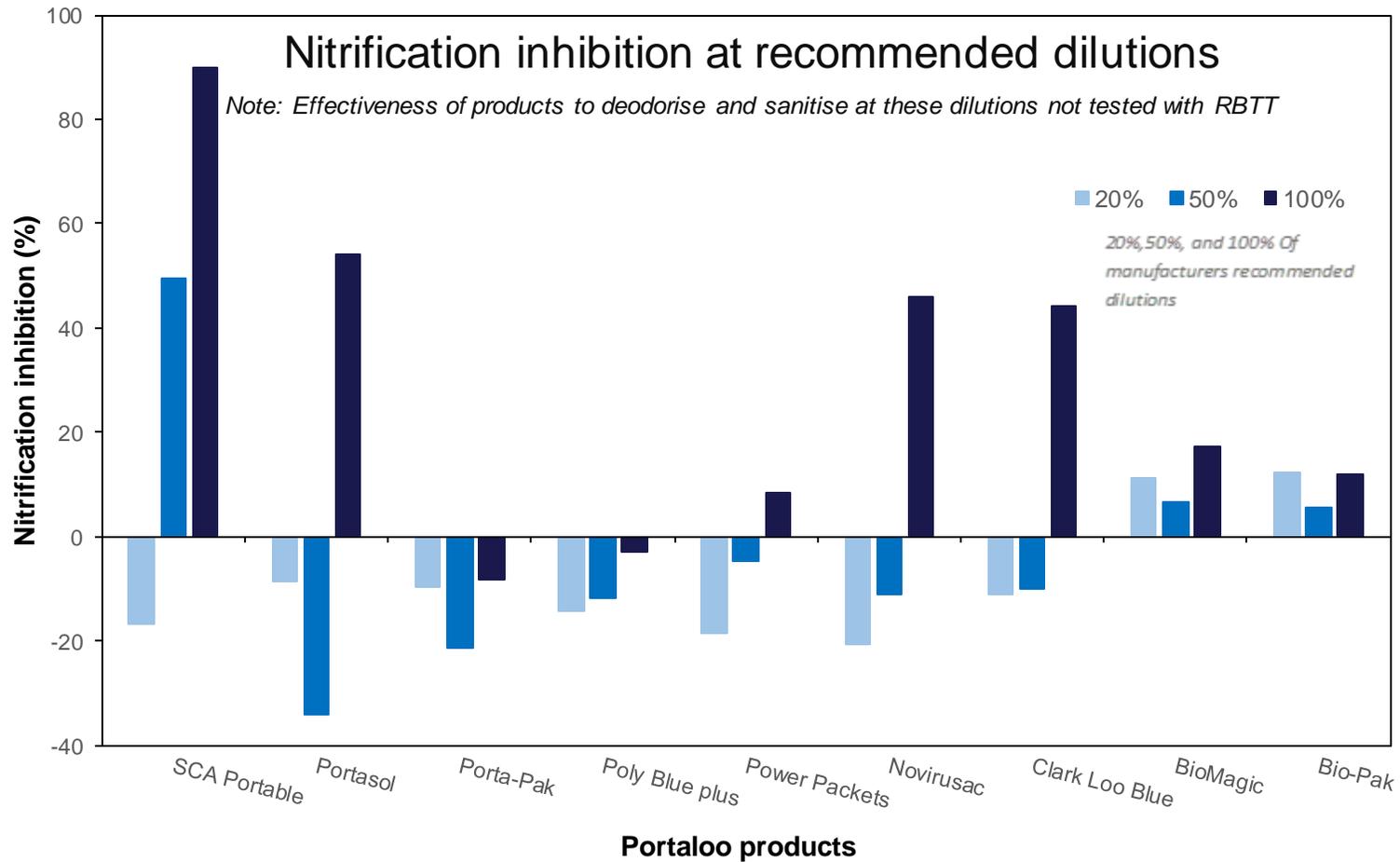
Results: High inhibition



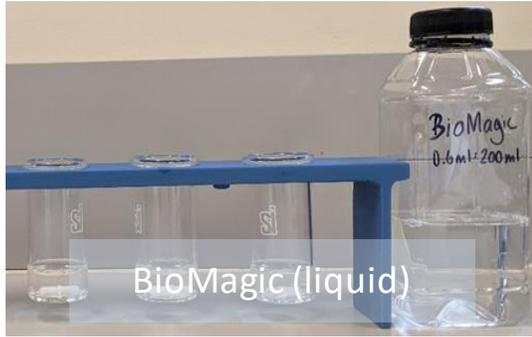
Results: Respiration inhibition



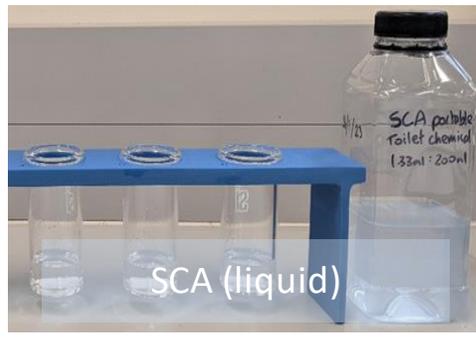
Results: Nitrification inhibition



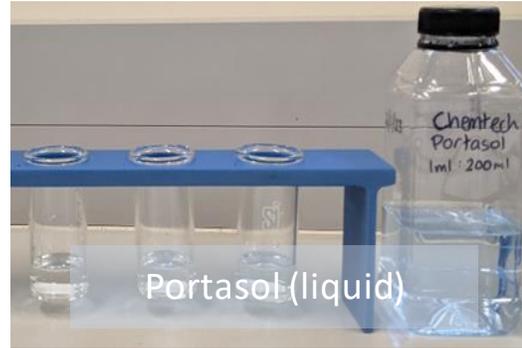
Variability



BioMagic (liquid)



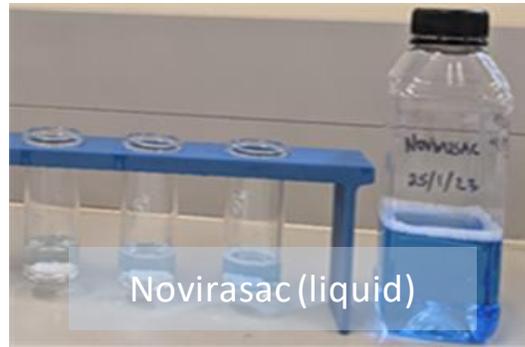
SCA (liquid)



Portasol (liquid)



Bio-pak (sachet)



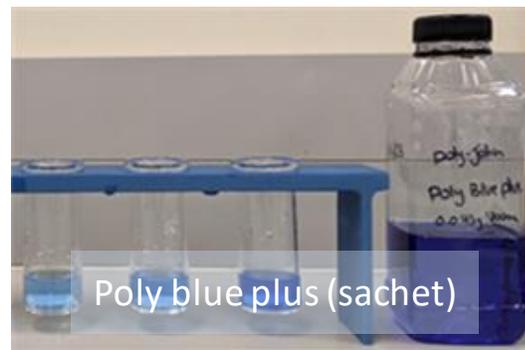
Novirasac (liquid)



Clarkloo blue (liquid)



Porta-pak (sachet)



Poly blue plus (sachet)



Power packets (sachet)

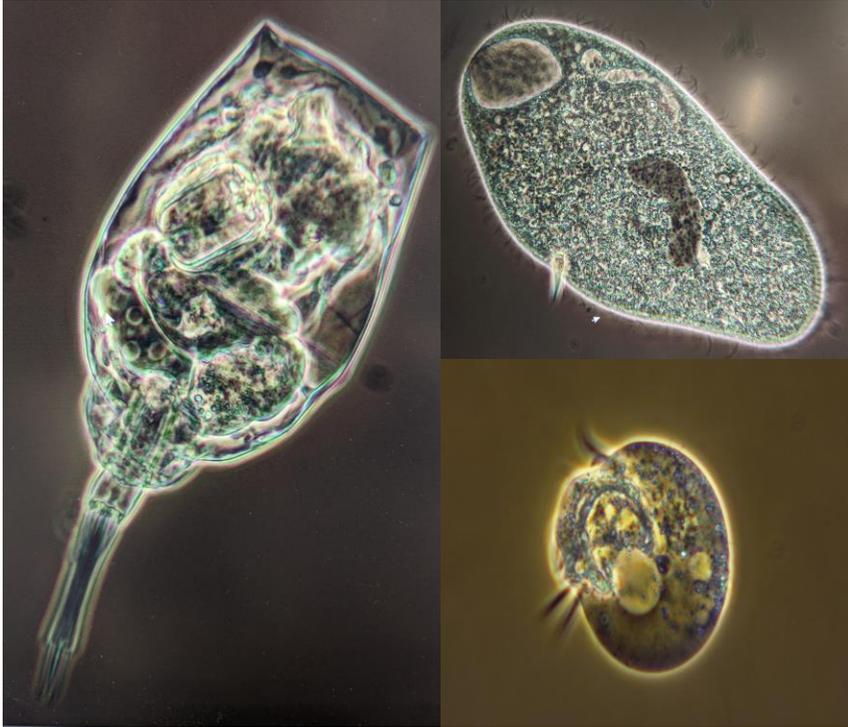
- Colour
 - Odour
 - Convenience
 - Effectiveness
- Concentration?

Key points and recommendations



- **There are potentially harmful products**
 - Some more harmful than others
- **Concentrations may be higher than recommended dilutions**
- **Toxicity testing helps navigate unknown waters coming to WwTPs**
 - Lowering toxicity to biomass
 - Increase WwTP optimisation
- **Know how toxic substances truly effect the important biomass**
 - Help keep microorganisms surviving and thriving

What does this mean for WwTPs



- **New Zealand regulations (tradewaste bylaws)**
→ Implementation of consents is needed!
- **Incoming potential toxic substances can be harmful**
→ Monitoring is recommended
- **WwTPs will need regulation of incoming loads**
→ Retention ponds / holding tanks

Acknowledgements

- Water New Zealand
- The Trade and Industrial Waste forum
- Gary Soper
- Anonymous companies
- Matamata Hire
- Dalley's Dunnyes
- Superloo
- SJ Allen
- Awamoa Sanitations
- Toilets and Tents
- Bob's Takeaways and Hireworks



THANK YOU
Pātai?



The
Wastewater
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Optimising your assets

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WaterNZ Conference 2023,
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