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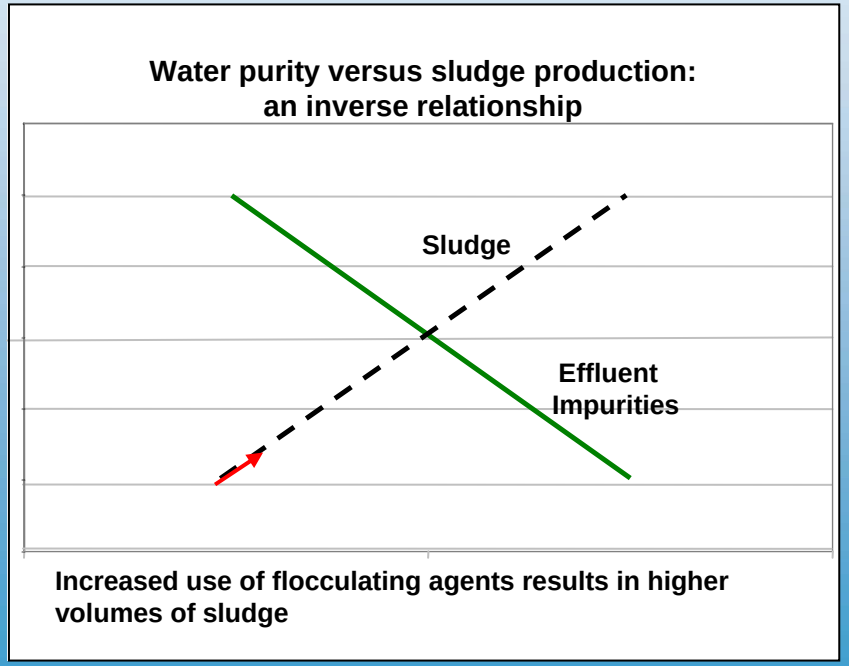
Tomorrow's environmental solutions today!

Enhancing the performance of waste water treatment plants with Arkea™ technology

The sludge management challenge

Constant pressure to improve effluent quality increases sludge production.

Need to reduce sludge generation without harming effluent purity.



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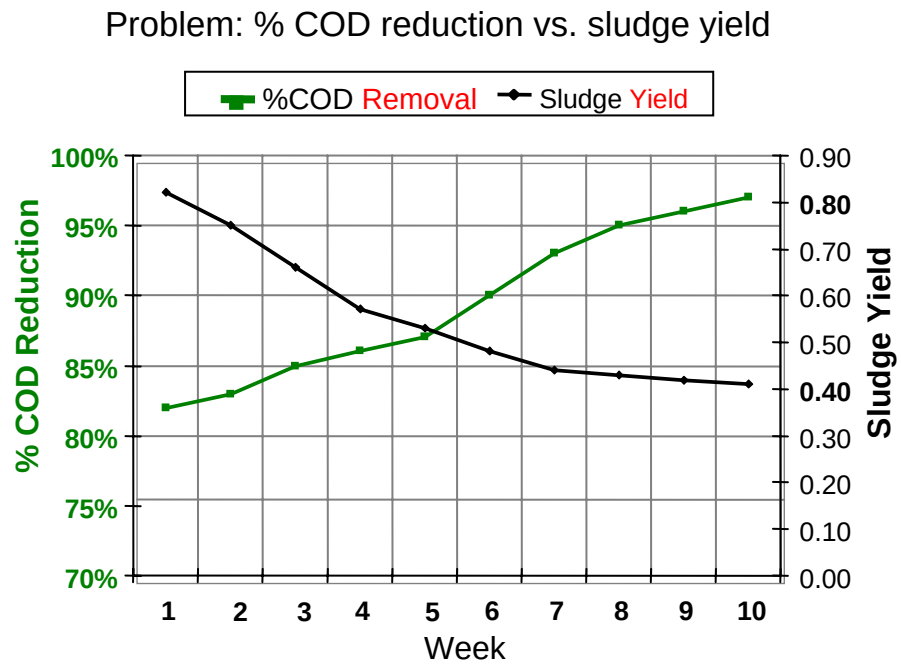
Arkea™ restores the optimal balance between low sludge production and high COD removal

Week 1: Typical WWT flow with low DO.

Adding Arkea™ increases COD removal and reduces sludge yield.

Week 10: Problem is resolved



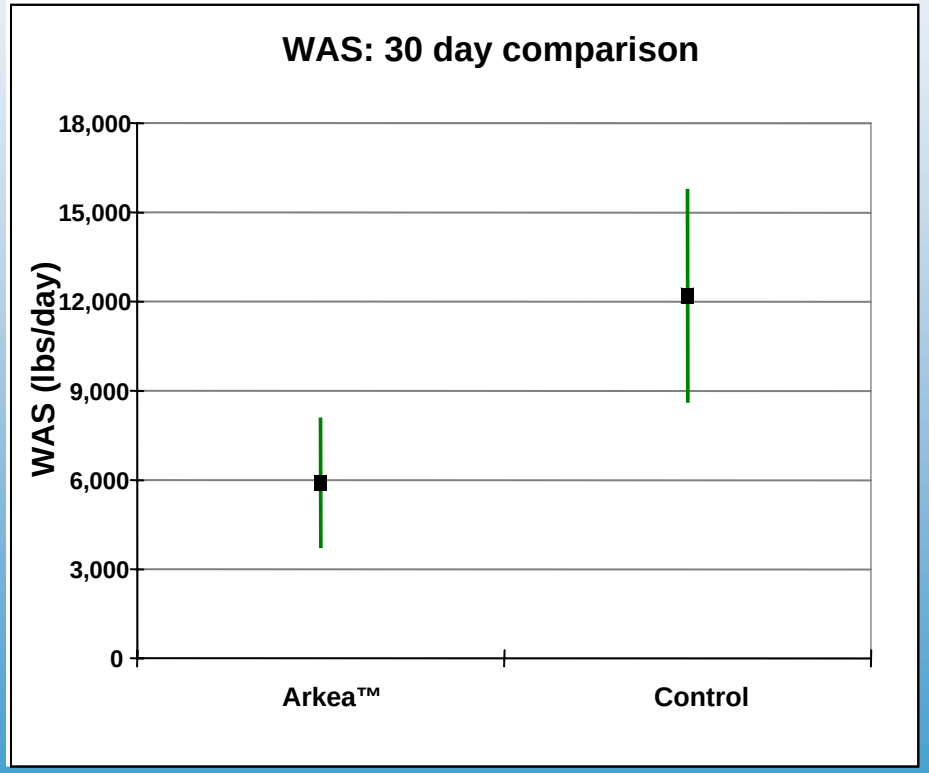
Site test comparison

Two adjacent streams with split flow and separate returns.

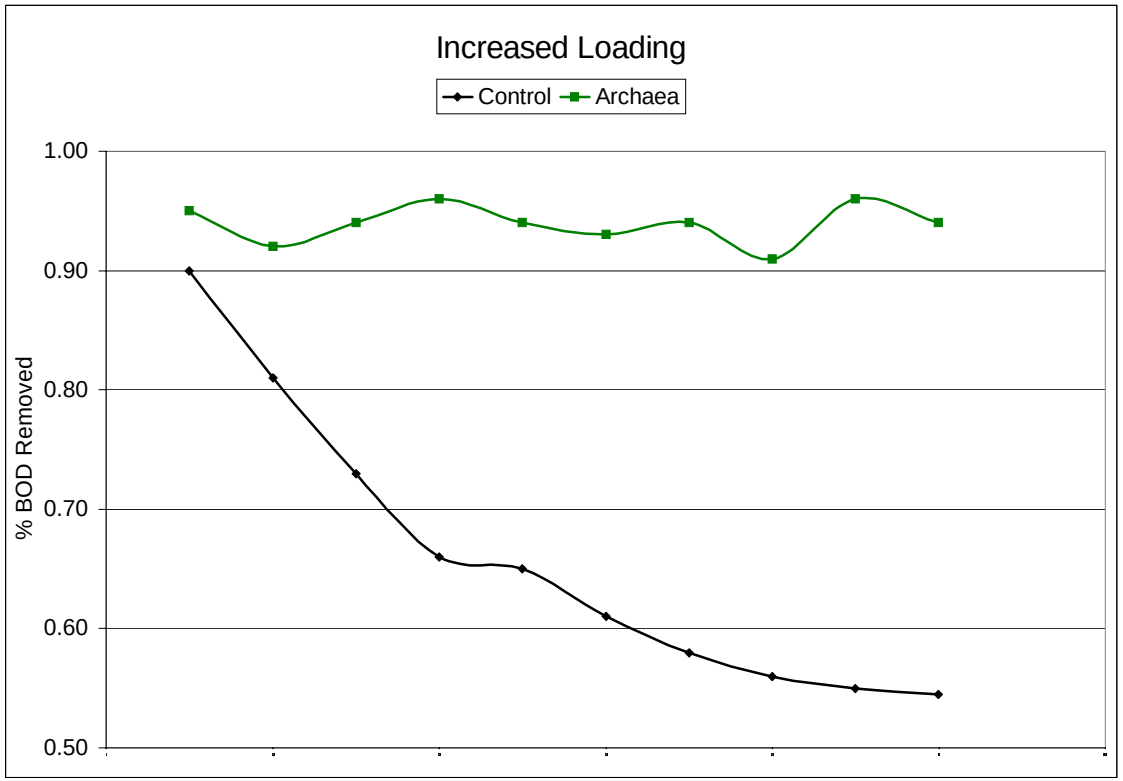
Data shown are mean +/- two standard deviations.

Control stream generated over 200% more WAS than the Arkea™ treated stream.

WAS = Waste Activated Sludge



Arkea™ deals with overloads (slugs) in waste water treatment plants



Medium-sized city with instant coffee plant that produces high CO and high NH_3 slug loads. **Arkea™** treatment compensates for slugs.

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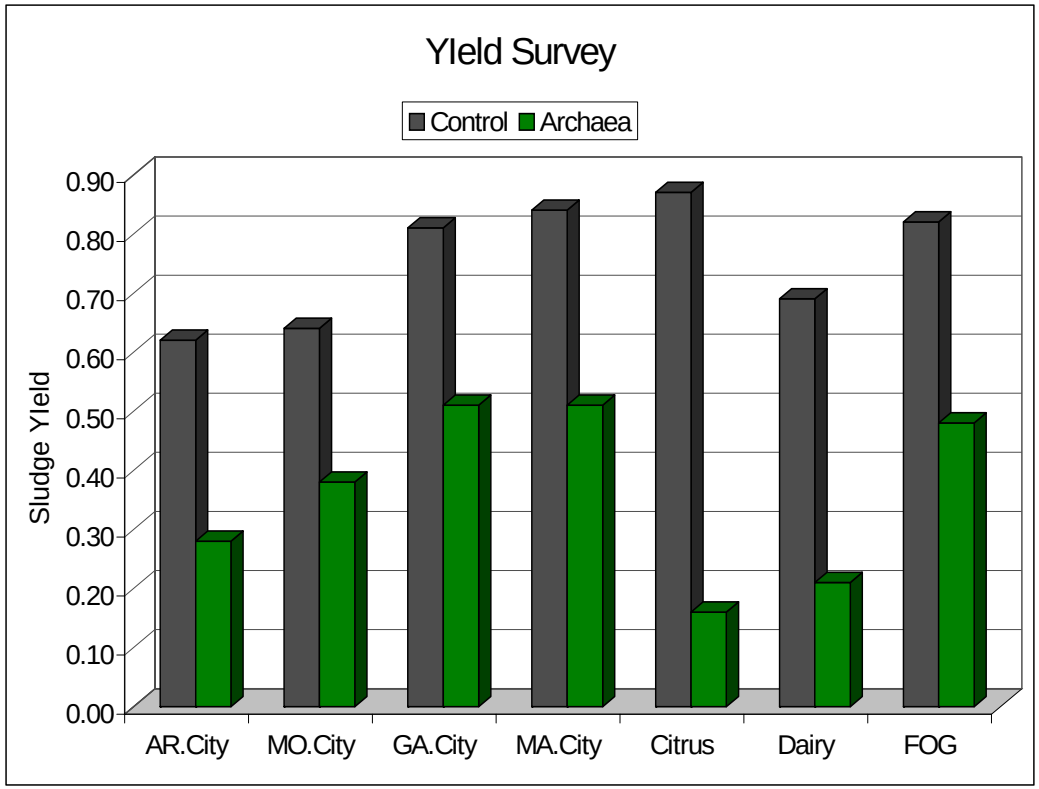
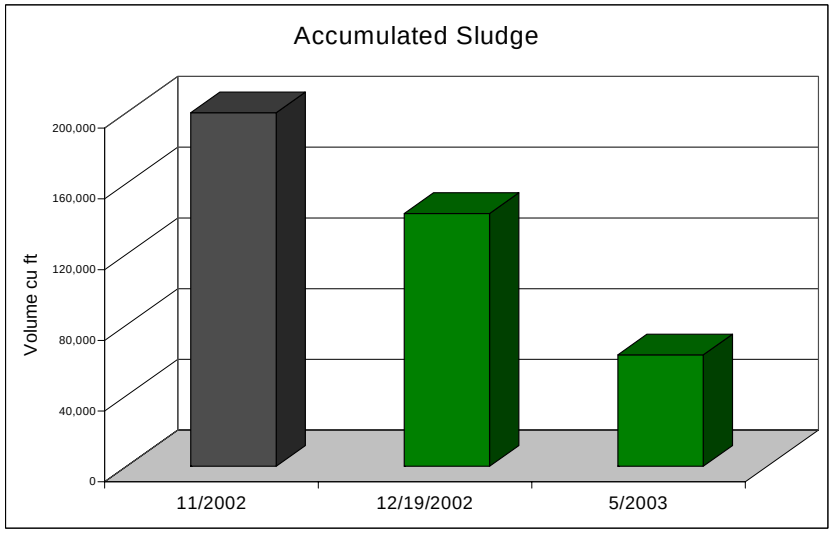
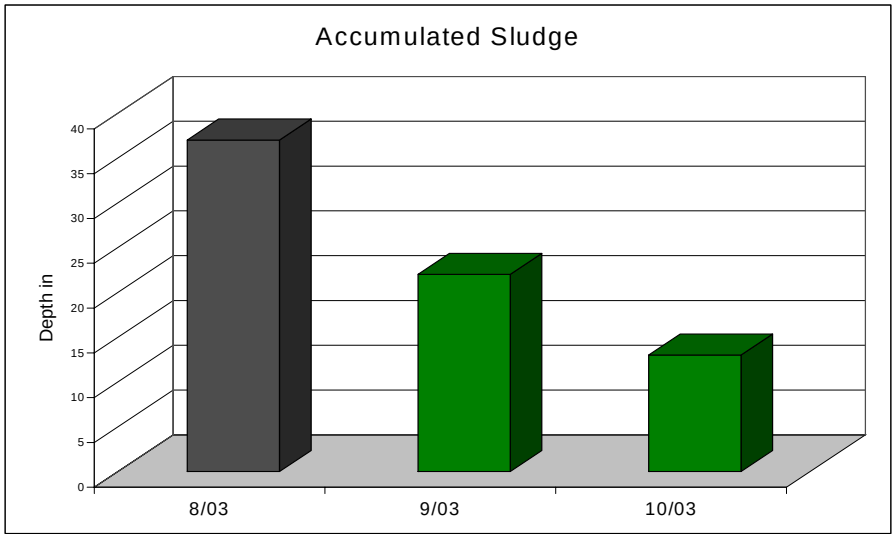
Sludge reduction in waste water treatment plants is assured with Arkea™ installation

- Sludge yield reduced across wide variety of applications and geographies.
- Universally positive impact.
- 160% return on investment.



Biological Dredging





- Two cities with excess accumulated sludge in lagoons.
- In both cases, biological dredging with Arkea™ reclaimed significant hydraulic volume at about 1/3rd the cost of mechanical dredging and without shutting down.

"Off-On-Off" Arkea™: impact on sludge yield

19 million gallon p.d. plant

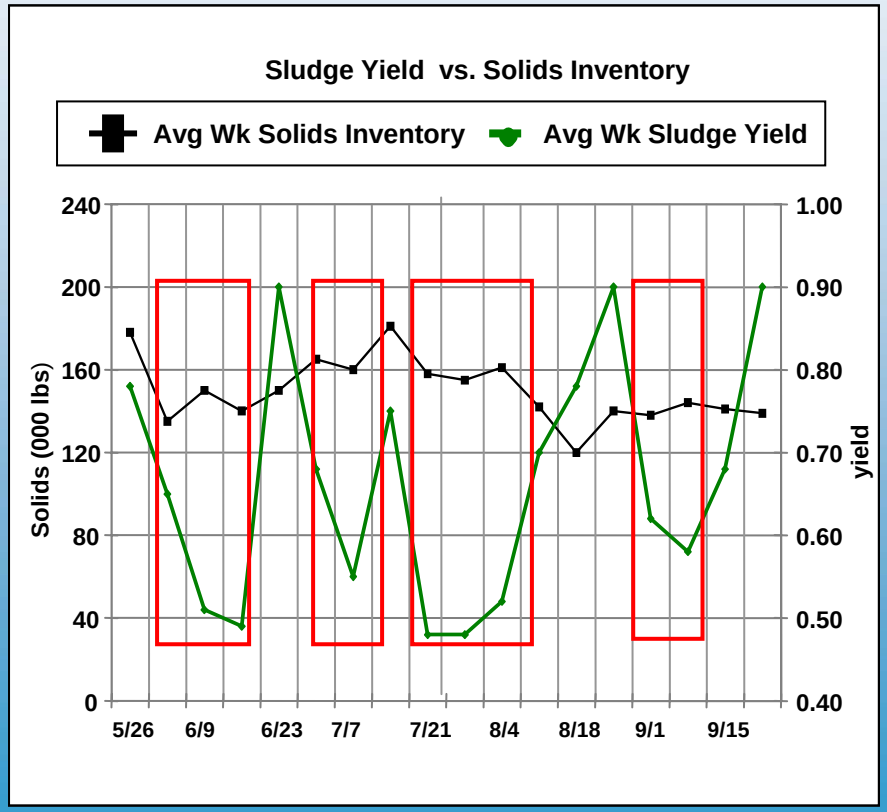
Arkea™ treatment activated during periods in red boxes.

Treatment turned off for several cycles in between.

Weekly solids inventory.

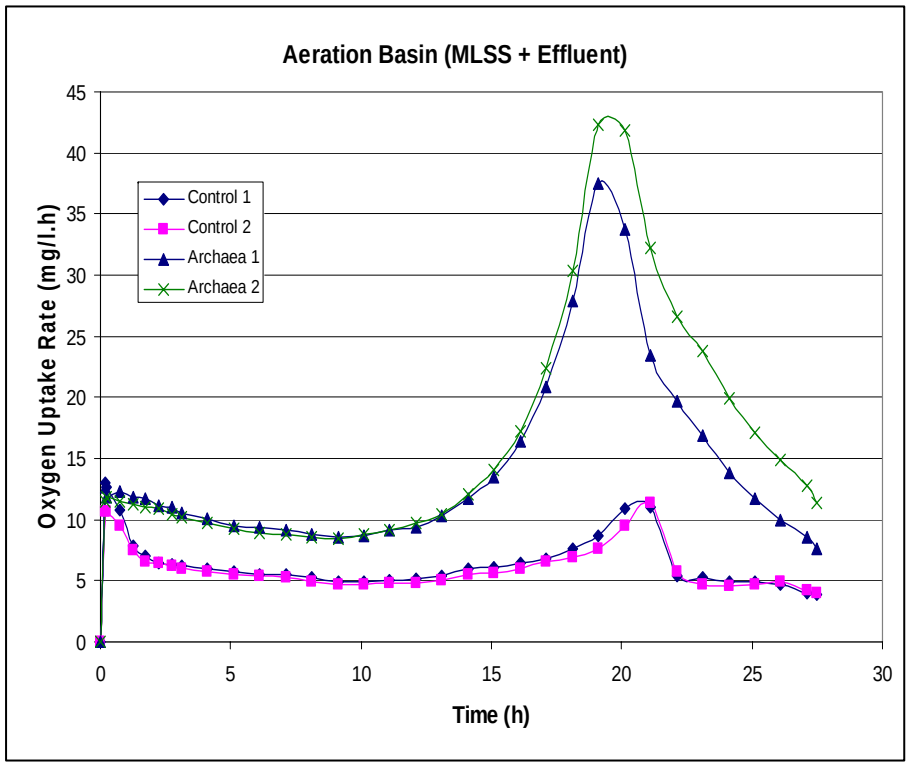
Conclusion:

When Arkea™is "on" sludge yield drops. When it is "off" sludge accumulates.



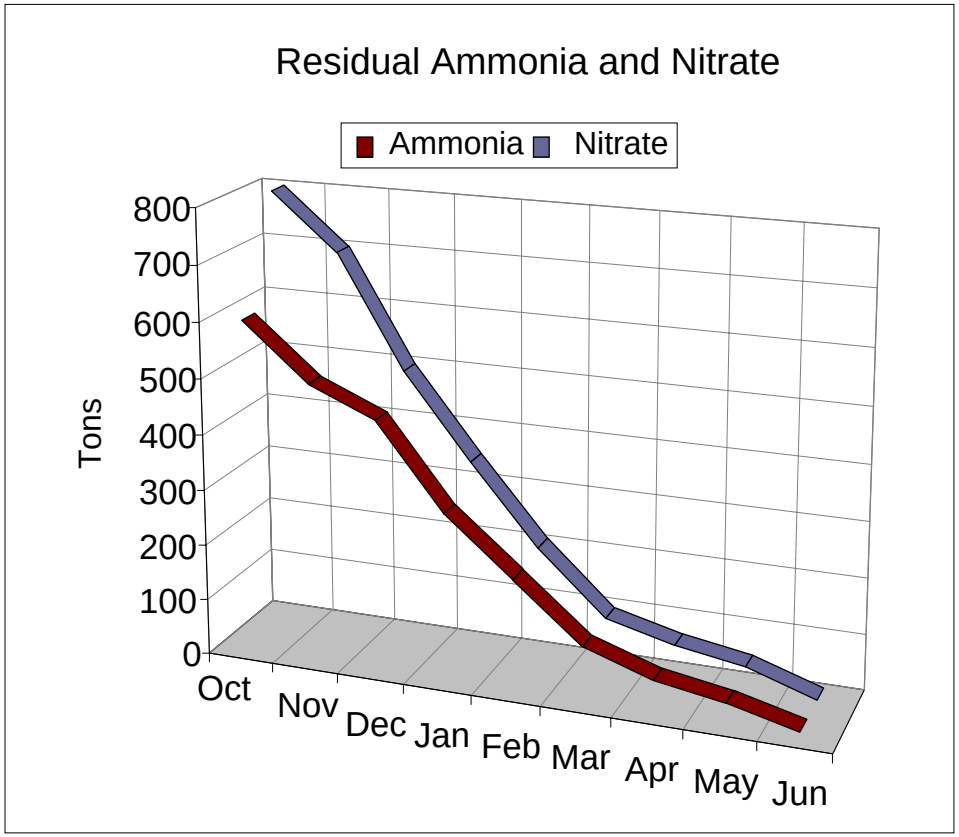
Biocidal Citrus Oils

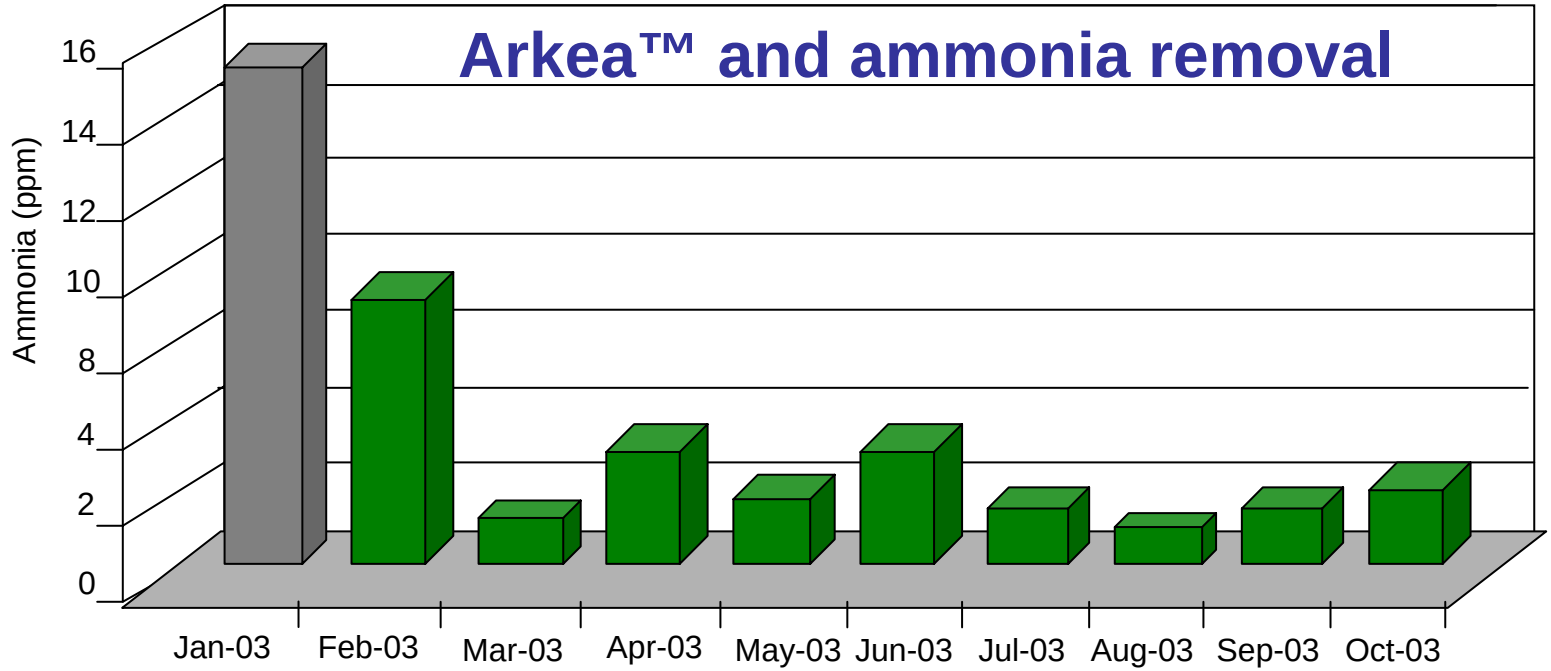
- Chart shows data from respirometry analysis of citrus processing waste.
- Citrus waste contains biocidal essential oils.
- Superior oxygen uptake with Arkea™.



Eliminating nitrogen

- Plant producing sulphuric acid, nitric acid, and ammonia for explosives.
- 150 million gallon “lake” to dilute it.
- Need to eliminate ammonia, nitrate, sulphate to be within limits.
- Reduced levels to zero over nine months





Arkea™ effectively manages ammonia

- Oxidation pond treatment plant (1.5 MGD).
- Dosing equations calculated based on incoming BOD and ammonia levels
- Samples taken weekly: chart shows monthly mean values.
- Similar results noted in municipal and domestic waste water treatment plants
- Kinetics of ammonia breakdown have been established.
- In addition to reduced ammonia, total nitrogen is also effectively managed.
- This allows improved engineering of the process.