



# Mobile PAC Dosing at Numurkah WTP

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## Background

Over the course of 2015/16 a new Water Treatment Plant (WTP) was constructed at O'Kanes Rd, Numurkah.

The plant draws raw water from a 280ML storage dam that was built back in 2012/13. Over the 3 years the storage had been supplying the old WTP in town, no Blue-Green Algae (BGA) outbreaks had been detected.



If the current trend were to continue, was there justification to build a fixed Powdered Activated Carbon (PAC) plant? Understanding however that this part of the WTP may sit idle and never be used after considerable investment.

SO what was the solution?

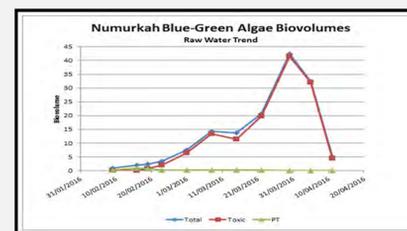
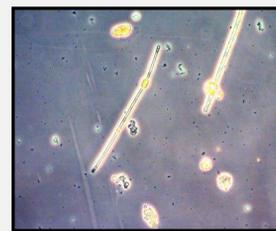
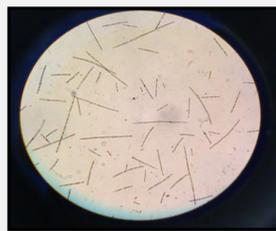
## Objectives

The concept of a **Mobile PAC Dosing Trailer** was born. Discussions were held with our contractor about building a trailer based unit that could travel to any of the water treatment plants within the corporation as required.

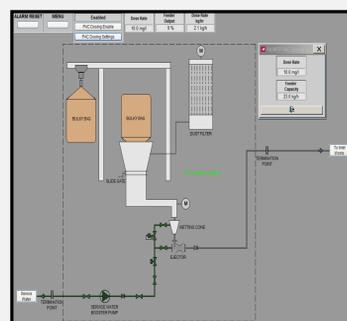
If Numurkah is algae free, and another district is experiencing an isolated algae bloom, you hitch it up to the back of the ute and off you go to save the day. Brilliant!

## Murray River BGA Outbreak

Beginning in February 2016 a major BGA bloom compromised the integrity of water quality in the Murray River and many of its tributaries. The Numurkah raw water storage is filled via the 6/6 channels of the Murray Irrigation System so our first BGA bloom at this site was realised. After a routine fill, Bio Volumes of the known toxic BGA *Chrysochloris c.f. ovalisporum* reached as high as 42 mm<sup>3</sup>/L.



## Operation



Requiring 3 phase power, compressed air, and mains pressure water, the trailer can be set up anywhere. A manual variable speed control on the feeder gearbox allows dose rate adjustment when the unit is not connected to a plant SCADA system. The trailer is designed to use 300kg bulk bags of the activated carbon. A wetting cone and venturi arrangement mixes and delivers the PAC solution to the raw water injection point.



## Results



Laboratory and Operational samples of treated water showed excellent performance for the removal of algae cells and were consistently free of Toxin and Taste & Odour contaminants. The PAC trailer performed well throughout the entirety of the bloom.

Sedgewick-Rafter Vol. (ml)	1.0196	Concentration Magnification		Total Count (cells or units/ml)	Individual Algal Unit Volume (um <sup>3</sup> )	Total Volume (mm <sup>3</sup> /L)
Fields	1 : 1	-200x	-100x			
		20	500			
<b>CHLOROPHYCEAE</b>						
Chlamydomonads		0	1	2	250.00	0.00049
Chlorococcoids		0	4	8	500.00	0.00392
Selenastrum		0	1	2	250.00	0.00049
<b>CRYPTOPHYCEAE</b>						
Cryptomonads		0	1	2	320.00	0.00063
<b>TOTAL BGA</b>						<b>0.00000</b>
<b>TOTAL ALGAE</b>						<b>0.00553</b>
<b>TOTAL Toxic BGA Biovolume :</b>						<b>0.00000</b>
<b>TOTAL Potentially Toxic BGA Biovolume :</b>						<b>0.00000</b>

## Conclusions

The mobility and versatility of the unit provides an excellent asset to the corporation. Furthermore, modifications will make for a very effective and user friendly piece of equipment. After a successful season Goulburn Valley Water are considering the purchase of additional units.

