



CASE HISTORIES

The Waterwise Aerator range has been patented by Jack David Collins.

Australia Waterwise Engineering have been responsible for the research and development, design and engineering of the product range. Waterwise Aeration Technologies is the current supplier for the U.S.A, Canada and Mexico.

From the year 2012 Waterwise Aerators were installed though Victoria and NSW on a site specific basis. The following selected sites are designed to supply information on the kind of problems experienced and how Waterwise **solved** these problems:

CASE 1

→→ Lammatina's Carrot Farm, Mildura

Situation: "Odour" emanating from wastewater pond at rear of factory. EPA issued warning.

Challenge: The factory produces 6000 tonnes of carrots per week. Reduction of BOD and TSS count required.

Odour to be significantly reduced.

Solution:

- Install a Waterwise Aerator 5-9kW unit in pond. Within 5 days of installation the odour was completely removed and the odour has not returned since installation of the aerator



CASE 2

→→ Benalla Abattoir, Benalla

Situation: "**Standard of discharge and odour**" from wastewater lagoon and licence to discharge was under threat by the EPA.

Challenge: The abattoir processes 500 animals per day.

BOD, TSS, Ammonia and phosphorus count to be reduced.

Solution:

- Install a Waterwise Aerator 3.1kW unit. Since the installation water quality has significantly improved and no odours have been detected. EPA has reissued the abattoir's licence to discharge for 2013.





CASE 3

→→ Western Water —Purification Storage Dam, Riddells Creek Situation: “**High blue green algae**” preventing the reuse of the water for irrigation.

Challenge: This is the main winter storage facility for Western Water. Reduction in blue green algae required.

Solution:

- Install a Waterwise Aerator 5.9kW unit. Since the Waterwise Aerator has been installed the Blue-Green Algae count has fallen from 1.2 million cells per litre to 0-342 per litre and holding for the 3 months at a time of the year when algal blooms proliferate. In operation since 2012.



CASE 4

→→ Cootamundra Abattoir, NSW

Situation: “**Odour and EPA licence**” non compliance on discharges.

Challenge: Abattoir processes several thousand animals per day. Reduction in BOD, TSS, and other composites that make up odour.

Solution:

- Install a Waterwise Aerator 3.1kW unit. Result, odour removed within 5 days of installation and BOD's fell from 893mg/L to 34mg/L - Suspended Solids fell from 20,000mg/L to 311mg/L within a 6 week period. EPA licence secured.



DESIGN

In October 2012 Waterwise wanted to change the overall look of the Waterwise Aerator 3.1kW and 5.9kW systems without changing or altering the system design.

They were to create a more ergonomic look, provide a high level of protection for its manifold arrangement and offer durable and safe lifting capabilities for logistics, site installation and easy positioning. In addition unlike its competitors it was to create flexibility in enabling the unit to be moved from one pond to another without the hassle and costly over- heads in doing so. It also needed to meet OH&S standards for on-site conditions and workers. The units can easily be dropped in via the side of the embankment with out having to use large and costly crane equipment.



CASE 5

→→ Radford's Abattoir, Skinners Road Warragul

Situation: "**Odour and sludge**" in primary wastewater pond, EPA warning issued.

Challenge: Abattoir processes 600 animals per day employs 400.

Reduction in BOD and TSS required and other composites that make up odour. Surface sludge to be eliminated

Solution:

- Install a Waterwise Aerator 3.1kW, installed in November 2012. No odours detected since the installation
- Surface sludge eliminated
- EPA Approved



CASE 6

→→ Junee Abattoir, Byrnes Rd, Junee NSW

Problem: "**Odour and sludge**" build up in primary wastewater pond. EPA licence, non compliance on water discharge and reuse.

Existing system - Self-aspirating aerator, inefficient and not performing in meeting requirements.

Challenge: Abattoir processes several thousand animals per day.

Reduction in BOD and TSS required and other composites that make up odour.

Surface sludge to be eliminated.

Solution:

- Install a Waterwise Aerator 3.1kW with chopper pump impeller (new internal design) installed in November 2012.
No odours detected, sludge build up eliminated.





CASE 7

→→ TEHL Kuangcheng County China, Municipal Wastewater Treatment Plant

Application: Primary Treatment of Leachate

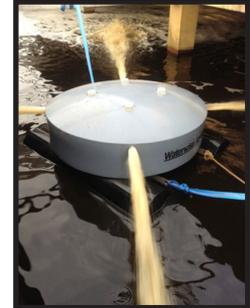
Situation: Breaking down the long chain “**chemicals, odour and reduction in power consumption**” from existing aeration equipment.

Challenge: The site receives domestic waste to 2 holding ponds. Pond 1 is a underground concrete pond and pond 2 is an above concrete pond with one small, narrow opening.

COD's and odour to be reduced, along with power consumption on old aeration equipment.

Solution:

- Install 2 x 3.1kW Waterwise Aerators one in each pond. Unit installed in pond 2 was fitted with 45 degree bends to compensate for the narrow basin.
- No odours detected since the installation, Water quality has significantly improved and power consumption reduced
- Played a major role in complementing additional treatment processes in performing more efficiently and effectively



CASE 8

→→ Southern Meats, Goulburn NSW

Situation: “**Odour and sludge**” in primary wastewater pond, existing aeration equipment, inefficient and costly to run. Challenge: Old technology 15kW surface mixer was constantly breaking down and needs to be replaced. Reduction in BOD', TSS and other composites that make up odour. Reduction in energy consumption required.

Solution:

- Install a Waterwise Aerator 4.7kW system with chopper impeller
- BOD's and TSS have significantly reduced
- Power consumption has significantly reduced
- No odour detected





CASE 9

→→ Lower Murray Water, Kerang VIC

Situation: Severe “**odour**” problem in primary wastewater pond, hydrogen sulphide has spread through out the town. Challenge: Kerang WWTP consists of 4 ponds, 3 evaporation ponds and 1 primary facultative pond. The pond layout and design is to cope with the towns domestic waste, however such lagoons comprise highly stressed eco- systems with a delicate balance that can be easily disturbed by changes in meteorological conditions and increases in waste loads.

Solution:

- 5.9kW Waterwise Aerator was installed in a partial mix configuration, with an inlet draft tube directed towards the surface to reduce the destabilization of settled sludge and avoid macroscopic admixing between the anaerobic and aerobic zones. High strength wastewater is kept in the anaerobic zone while the aerobic zone is enlarged, supporting the growth, accumulation and generation of additional aerobic bacteria that intercept and convert toxic and odorous compounds into those that are olfactory inoffensive and safe.
- No odour has been detected since the installation, facultative lagoon has maintained an equilibrium.



CASE 10

→→ Central Gippsland Water, Drouin VIC

Situation: “**Ammonia**” problem in primary wastewater pond.

Challenge: Drouin WWTP consists of 3 ponds, there primary pond is fitted with 2 x 20kW mechanical surface mixers.

One of the mixers have broken down and the urgent requirement of a temporary replacement unit is required to reduce the rise in Ammonia. There is no pre-screening, therefore rag and solids content is high.

Solution:

- Install a 5.9kW Waterwise Aerator fitted with a chopper impeller.
- Reduction in Ammonia - Confirmed





CASE 11

→→ Fish Farm, Griffith NSW

Situation: “**Low Oxygen**” problem in primary pond.

Solution:

- Install a 3.1kW Waterwise Aerator fitted with a suction screen



CASE 11 OUTCOME

A Waterwise Aerator 3-1kW was installed in a fish farm in N.S.W Australia to remediate the very low Dissolved Oxygen (D.O.) levels in the breeding ponds. The D.O. levels were down in the low 2.s which is stressful for fish in intensive breeding programs. Within 4 days of installation the D.O. levels rose to 9 in the afternoon and 5-6 in the mornings. The D.O. levels normally drop of a night time. The pond is approx. 75 metres x75 by 5 to 6 metres deep giving a capacity of approximately 12 megaliters mega- litres. The company is exceptionally happy with the results now that the low oxygen problems have been solved. Each module in the pond carries 20,000 fish. The company will now install another breeding module in that pond which will double the production ability.



EXPLANATORY BACKGROUND NOTES OF CASE HISTORIES

The original purpose of the Waterwise Aerators was to accelerate the process of breaking down bacterial pathogens in the traditional method utilising a low cost low maintenance regime. The main improvement being the increased air and water intakes and blending/mixing, which would significantly add to this method of breakdown.

The use of a submersible pump into a collector manifold as opposed to a gear box method of operation was the break- through innovation with these aerators. We were originally advised that the flow rates were approx. 4 mega litres of water to 2 mega litres of air which was passing through the aerator based on the 3.1 kW or 5.1 kW pump details. Since the success of the Waterwise Aerators full scientific tests now reveal that the flow rates are several times higher than the rates we were originally told. (Please refer to technical specification data sheets)

Tests were originally conducted with Monash University and additional tests are been conducted with the University of Southern Queensland.

The results in the case histories involving odour control and improved discharges were no surprise, however the removal of the Blue Green algae at the storage dam for Western Water and the partial mix configuration for facultative lagoons at Lower Murray Water was an additional benefit. Add these performance levels mentioned in the case histories to the low power cost and negligible maintenance costs and you have a system of treatment that has unlimited possibilities.

All test results supporting the above case histories are available on request through:
Waterwise Aeration Technologies