

The things to always remember are:

- Head level of the pump is how high it can pump water and at what rate it can pump at that height. Information about pump capacity can be in per hour or per minute. To calculate 500L moved in 60 minutes is  $500/60 = 8.33\text{L}$  per min. So, the pump must do at least 8.33L per min to the height of your grow bed for it to be effective.
- Always try and get a pump that uses less wattage. The pump runs 24/7, so if the pump is 200W then the electricity used is 0.2 kW per hour. This is 4.8 kW per day, 33.6 kW per week and 1747.2 kW per year. This can cost approximately \$380/year at current electricity prices. Pond pumps can range from as low as 10W:

### *3. Pipes, hoses and connectors*

Pipes, hoses and connectors are used to allow for the movement of water through the system.

Pipe and fitting kits can be obtained from Bunnings or a local hardware store. However, it is important to make sure the pipes and hoses are safe for drinking water. Some PVC pipes contain lead, although almost all PVC pipe sold in Australia are lead free. However, the connectors might not be. Check first.

### **Other elements of an aquaponics system**

In a gravel bed system other elements required are:

- Gravel bed using hydroton † or other grow media
- Bell syphon or other type of syphon

A floating raft system needs:

- Polystyrene sheets
- Net pots
- Biofilter
- Aerator

The NFT system needs:

- Lots of PVC pipes
- Biofilter
- Aerator

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\* I use a pump that does 4500lt at 60W. Over 1 year the use is 524.16 kW or about \$115.

† Hydroton is a clay based media that allows bacteria to grow in it. Available from hydroponics stores.