Bbos Water Treatment visit by BBHOA

Bbos household water is sourced from two boreholes that are both approx 80 m deep. At this depth there would be no contamination from surface water or leaking septic tanks / conservancy tanks.

Surface water in this area is an option but it would not be possible to completely remove the colour from natural tannins and would therefore be unacceptable for some residents. Surface water sources can dry up in severe droughts and the boreholes therefore also provide a secure, sustainable supply.

The boreholes are switched once every three weeks. They both penetrate into exactly the same part of the aquifer, hence there is no difference in water quality between them. The treatment plant does not record any difference in water quality once the boreholes are switched or during the switching process.

Interestingly the plant operators did say they had more of an issue with the low usage of our system. The treatment plant only ever operates at a maximum 40% capacity and they would prefer us to use more water to keep the system flushed through and to avoid having to stop and start the treatment system. Householders saving money by using less water or rainwater/river water are reducing the effectiveness of the plant – BUT not to the point where the water quality leaving the plant is compromised.

Load shedding is an issue for the plant. It has no back up power source – that is up to the municipality to provide. At the moment, the challenges are not enough to cause quality issues but if load shedding escalates to 12 hr outages within a 24 hrs period there would likely be water quality issues.

The main concern from a water quality issue in this area is iron and manganese, which is high in the raw water. The treatment plant primarily operates to remove these two materials from the water as well as controlling physical parameter such as turbidity and plate count (microbes). From the monitoring results BBHOA have seen there has never been an exceedance of the iron or manganese quality standards and we can be reasonably confident that the treatment is operating successfully to remove them. Average test values in the year worth of data we received are around:

- Fe 20 μg/l with the highest test value being 111 μg/l (limit <300 μg/l)
- Mn <10 μg/l, highest 20 μg/l (limit <100 μg/l)
- Chlorine <0.02 mg/l, highest 0.49 mg/l (limit <5 mg/l).

There are periodically high plate counts which tend to occur at the change of the season, especially as we move into warmer weather. This is controlled by spiking chlorine into the water – they called it surge dosing – for periods of 2-3 weeks. The plant officials accept it will be noticeable but levels do not exceed the international standards for chlorine in drinking water (see monitoring results above). The alternative of a high plate count is undesirable and would likely result in stomach upsets. They were not forthcoming on why this happened over the xmas holiday period, but as we have speculated perhaps they ran out of raw materials (i.e., chlorine) over the holiday.

We discussed the occasional brown water experienced by residents. The opinion of the plant staff was that this was likely a distributional issue with the water pipes. The plant manager was shown the recent photographs from homeowners by councillor Fourie. If the water leaving the plant was compromised it would have a greenish/black colour that was permanent rather then a periodic

brown colour. The plant manager speculated that the colour we are seeing is due to silica and is getting into the water from leakages/damage allowing soil or sediment to ingress into the distribution system. Even if this is the case because it is periodic and not persistent it is not an immediate health risk but more of an inconvenience.

We did ask about the possibility of completely flushing the system through on a periodic basis to remove any possible sediment. The plant operators felt this was a bad idea as it could shock the system and may lead to pipe damage. We may need to look into this further.

The plant operators also do not recommend the use of cartridge filters or reverse osmosis systems in households. They consider them to be expensive and unnecessary considering the quality of water leaving the plant. The type of cartridge filter brought to the recent community meeting has a typical lifetime of six-months and needs to be backwashed every month. It should not be needed and is therefore an unnecessary expense. It is better to just let the brown water run through when it occurs rather than continually keep filtering the household water. They also did not recommend it was necessary to boil water prior to drinking to kill microbes, but did admit there was some potential for the plate count to rise after water leaves the plant if there is a problem with sediment in the distribution system. There seems to be some controversy over the magnitude of this as a problem in the local area.

What we can do

1) Ensure that residents are aware that more or less quarterly chlorine levels are high enough to be detected on the skin after showering and will leave an odour in tap water. Levels are hot high enough to cause a health hazard and are preferable to the alternative (high plate counts). We need to contact the plant operators if the high chlorine levels persist for more than a few weeks.
2) Continue to send photographs of brown water to councillor Fourie when they occur. He will forward them to the municipality who will track where they are occurring. If there is damaged pipework we could then locate the areas where they have been damaged.
3) If we can keep a sample of the brown water when it occurs the municipality will have it analysed. If it turns out to be silica, as the plant operator suggests, then we know it's probably a sediment in the pipework issue. In the unlikely event that it is iron or manganese the plant may have a problem.

   Water samples can be kept in a plastic bottle – even an old cool drink bottle. The bottle must be washed and dried three times before the sample is taken so perhaps we should all ensure we have a clean plastic bottle ready to go. They should be kept in a fridge prior to collection for analysis. Ideally they should be collected within 48 hrs.

   In the meantime boiling water before drinking or using filtration systems are not going to cause any harm but for residents but are considered an inconvenience or expense (in terms of filters) that are not necessary.