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Ruskin Park Main Pond – Sustainable water management options

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Introduction

The main or 'ornamental' pond in the centre of Ruskin Park has been experiencing very low water levels which have resulted in the surface exposure of silt and mud.

The water level in the main pond has never been exceptionally deep, particularly in recent decades, as it appears to be a fairly shallow structure, but it has gradually become much lower in the last two years.

This situation is not helped by it being constructed with porous walls composed of bricks, mortar and rubble, which probably came from various demolished buildings which once lay on the eastern edge of the park on Denmark Hill. It is uncertain if the pond was ever lined, either on its base or walls, either with puddled clay or with an artificial liner.

Initial Investigations and Possible Causes

Investigations into what might be causing the pond's water levels to be much lower than in previous years have concentrated on three potential causes:

a) Insufficient water is entering the pond from natural or other sources, whether historical springs under or near to it, from normal water migration through soils from the rest of the park, or from surface/ground water runoff as a result of rainfall on the park and surrounding roads;
b) There is some form of leak or weakness in the pond, either in its base or walls, which allows more water than normal to escape. The banks are mainly loosely compacted bricks and rubble, with no evidence of any clay or other liners, and the pond's base is assumed to be natural clay or puddled clay, which can fracture and spilt with ground movement or subsidence;
c) An historical outflow sluice at the northern end of the pond, which originally allowed excess water to 'spill over' into a drain or sewer, has collapsed or is broken so that water is now being lost through this route.

The first cause has been looked into, but there is scant information whether a permanent spring fed the pond. There are various sources of the 'Earls' Sluice', which is one of London's 'hidden rivers', in and around Ruskin Park, but these are very 'mobile' and seem to have erupted in different locations in different decades.

When the original pond was first created (it is shown as a 'Fish Pond' in old maps of Denmark Hill) in the 1850s or 1860s it could have been built on top of an existing freshwater spring, but there doesn't seem to be any evidence it was a permanent one, or there were other permanent springs lying to the south or other sides of it.

One concern raised by park users was whether recent high-voltage cabling replacement works, undertaken by UK Power Networks (UKPN), in the park in 2018 and which run just to the south of the pond, could have cut or interrupted an old spring that fed into the pond.

However, correspondence with UKPN and searches of their own maps and excavation logs do not indicate any spring was crossed or blocked at the depth that the cables were. UKPN simply took out old cables and replaced like-for-like, and at the same depth as the old ones, and infilled around them with porous sand and gravels. They did not encounter any pooling or flows of water, and their inbuilt cable protection monitoring systems do not indicate any water gathering in or moving around their cable route.

UKPN confirmed they would have notified the council if they encountered any flowing or pooling water, as this is a significant risk to the safe operation of their cables and would result in actions to consider rerouting cables away from any actual or suspected water sources. UKPN have been asked to continue monitoring their cables and inspection chambers for activity that could indicate the pooling or movement of water around the pond.

It is evident that average annual rainfall in London has been progressively reducing over the last decade, coupled with prolonged periods of increasingly hot and dry weather, particularly in the last two to three years. This means that rainfall which normally falls on the ground and wets the soils in Ruskin Park, and percolates into layers of water-bearing gravels and sands (aquifers) which lie under the park and to the south and east of it on higher ground, could be substantially reduced. There just may not enough water finding its way through the soils and sands/gravels or over the ground to reach the pond and help to fill it to traditional levels.

Although Lambeth and London have experienced some very heavy periods of showers in autumn and winter, including this year, these might not be long and reliable enough to compensate for the progressive losses of persistent and steady rainfall to recharge the aquifers and keep a steady supply of water coming into the pond.

As for the other two possible causes for lowered water levels in the pond and how to address these, a site visit was held with representatives of AGA Group, an experienced lake and wetland landscaping and restoration company in September to identify what realistic options could be available.

It was noticed the pond is heavily silted, mainly derived from soils washed from surrounding fields and paths, along with accumulated detritus from fallen leaf litter and bird faeces. This will have steadily built up and in itself reduced the water level. Rather than a clean solid base, the pond is now mainly filled with a loose ‘gloop’ that might contain plenty of water but this is now intimately mixed in with fine solids and silts. A cubic metre of fine sludge or organic-rich silt can contain up to two thirds of water by volume. These silts are not breaking down fast enough, or being washed out of the pond, to prevent a consistent build up which is forming a mass of liquid ‘porridge’ rather than a layer of clean water with minimal silt.

Works undertaken in 2019 have removed and coppiced out many of the poor-quality willows and buddleja on the pond island to try and reduce the amount of leaf littering, in order to help prevent mud and silt build up, as well as open up ground cover to improve habitat diversity on the pond island and banks.

However, this will not have addressed the existing thick silts already in the pond, and which continue to accumulate. Continual fouling by waterfowl and soil wash off needs to be addressed as this will simply add to what is already there. What is more, these silts could be 'masking' defects in the pond base and walls that are allowing water to be lost, such as fractures or cracks, so whatever water gets into the pond are being quickly lost.

Restoration Options

AGA came up with a number of potential causes and solutions, each with their own costs and implications.

1. Desilt and repair the pond

Desilt the pond, taking out and reusing as much of the accumulated silt as possible to recover the pond base. This allows the base and lower bank walls to be inspected for fractures or leaks, and to either 'plug' with a carpet of self-sealing clay or coat with a layer of 'bentonite clay solution', which finds its way into fissures and expands to seal them.
The pond is then allowed to refill, along with regular rake outs of leaf litter and debris, and minimise nesting by waterfowl to reduce faecal waste accumulation. The excavated silt can be 'recycled' back as soil improver and conditioner around the pond banks behind suitable bunds or geotextile walls.

2. Repair or upgrade the outflow sluice

Expose and investigate the current condition of the old outflow sluice, in case it has collapsed or is allowing free outflow of water; the sluice could either be rebuilt or more likely removed and a simpler concrete wall installed along with a sluice board which can be adjusted to control future water outflow.

3. Install a groundwater borehole

Drill for a new small 'groundwater borehole' which can tap into much lower water aquifers beneath the park, which may be less vulnerable to drying out. This could be a simple solar powered unit that 'trickles' water in. However, it will still depend on finding a secure and reliable body of water to tap into that will keep the pond topped up.

Costs for Options

As for estimated costs, AGA can, as can other appropriate contractors, be asked to provide these for the three options above. AGA's opinion is that desiltation may be the most expensive as this requires dewatering of the pond, moving silt around and then reusing it along with suitable bunds and replanting.

However the technology to desilt small ponds has become more automated and efficient so it may not be an excessive cost once we have calculated the volumes and a realistic plan to then recycle it on site.

Disposal of silt off site is a major cost component of any pond works involving silt, so the more that is retained on site and used efficiently the better and the lower the overall cost.

Short Term Solution – Restoring a Mains Water Supply

In the meantime whilst these longer-term solutions are considered a quick resolution is to refill the pond using mains-derived water, taken from either an existing supply to it, or one that is run new from another nearby water outlet in the park.

There is an old mains water valve next to the pond which has not been used for some time, and its route needs to be retraced to the pond and another supply point in case the pipework is damaged or defective. We have commissioned a water supply contractors to locate the route of the pipework feeding this valve, and to either restore a mains supply or to provide costs for replacement, and these investigation and/or restoration works are imminent.

However, rather than just pour mains water straight into the pond, we can create a set of filter beds to 'polish' the water and trap or reduce nutrients like phosphates and nitrates, or chlorine, to minimise the risk water harms any wildlife in the pond or triggers an algal bloom.

These filters will be composed of soils, aggregates and reeds obtained from the pond in the Wildlife Area, shored up by fencing, sacking or geotextile. This will be created at the southern edge of the pond, where the new restored mains supply will come in, and can use existing materials like logs, soils, rocks and fencing panels. We expect to create these with local volunteer assistance as and when the main supply is restored or is ready to operate.