

Hydrating Bungarribee

COUNCIL NAME

Blacktown City
Council

WEB ADDRESS

blacktown.nsw.gov.au

SIZE

247 square kilometres

POPULATION

336,962

PROJECT PARTNERS

RMIT University
JMDdesign
Western Sydney
Parklands Trust

FUNDING PROGRAM

Building Resilience to
Climate Change

Overview

The projected impacts of climate change on Western Sydney and its parklands include increased temperatures, and less but more intense rainfall events causing both drought and flood conditions. Hydrating Bungarribee investigates a potential method to ensure suitable and secure water supply to Bungarribee Park by using treated wastewater (from the sewer). This project has developed a concept design to engage with the community to increase acceptance of appropriate wastewater reuse for climate adaptation purposes.

If successfully implemented, the treatment system would increase the parkland's resilience to climate change by retaining water in the landscape. Irrigation of park vegetation will ensure growth during dry periods as well and provide heat mitigation through transpiration, shade and passive cooling. The wastewater treatment system design relies on biological processes and would require little energy to run. Landscape design elements have been integrated into the treatment option to deliver high quality recreational, environmental and educational outcomes.

Background

Bungarribee is over 200 hectares and is in the north section of the Western Sydney Parklands at Doonside. The Western Sydney Parklands Plan of Management 2020 identified Bungarribee as an emerging regional tourism, recreation and community hub, providing extensive facilities for the community of Western Sydney.

The flood and drought prone site is in close proximity to one water course; Eastern Creek, with intermittent flows, bank erosion, poor water quality and weed infestation. The sewer main below the Park has constant, large volumes of nutrient rich polluted water that bypasses the often parched site completely.

Climate change is predicted to severely impact Western Sydney and its open spaces. The site's riparian ecosystem will come under increasing stress as less frequent and more intense rainfall events generate dryer conditions interspersed with high flow events. An increasing population and accompanying demand for recreational space will exacerbate these impacts.

A key factor in maintaining the attractiveness, recreational potential and the health of Bungarribee under increasingly difficult environmental conditions will be the management and availability of water. This project developed a design that incorporates the use of treated wastewater to irrigate and encourage plant growth - providing heat refuges and shading for park users.

Implementation

Bungarribee has two major sewer networks which flow beneath the site. These networks service the surrounding residential area as well as adjacent industrial zones. Flow rates and water quality in the sewer trunk were monitored over 5 days to inform the potential yield and treatment design. The design of the 10,000 kL/day wastewater treatment system incorporates:

- An anaerobic pond to remove 50-85% organic content and solids. This will produce methane, hydrogen sulphide and carbon dioxide which can be captured and reused.
- A wetland system that will use a combination of physical and biological mechanisms to reduce solids, organics, nitrogen and phosphorus.

The proposed wastewater treatment facility is designed with raised treatment “ponds” to reduce environmental impacts of high nutrient loads during flood events. The landscape treatment of native mass-planting will soften the linear form of the ponds. Park user interaction with the ponds could occur at later stages of the purification process. Other potential water-reuse strategies are being developed including the consideration of irrigation for flower production and nearby sports grounds, and use in a proposed nearby zoo.

The design requirements and community consultation process was workshopped with asset owners and regulators including Sydney Water, Western Sydney Parklands Trust, Blacktown City Council, NSW Environment Protection Authority, Office of Environment and Heritage and the Greater Sydney Commission. This collaboration identified key design criteria and regulatory considerations. It is noted that further monitoring and site evaluation would be needed if the design was to proceed to the next stage of investigation.

The community was engaged through an online survey to understand the current perception of and willingness to accept wastewater recycling. Over 80 responses were gathered through Bankstown City Council and Western Sydney Parklands Trust’s websites, social media and networks. Additionally, park users were surveyed onsite. Most respondents (75%) stated that they would support their local area recycling wastewater for activities such as irrigation and growing plants. It is noted that if the project proceeds beyond the concept stage, further engagement and consultation with the community and stakeholders will be vital.

Outcomes

The project achieved a number of important outcomes, including:

- The development of an innovative design concept that could deliver a constant water supply to Bungarribee Park by tapping into the sewer and reusing wastewater.
- Engagement with Blacktown residents and park users on the potential for recycled wastewater treatment options and community acceptance.
- It used a multi-disciplinary approach to wastewater reuse and technological solutions.
- It engaged a wide range of stakeholders who contributed their expertise to the project and examined regulatory and administrative barriers which will require further collaboration to address.
- It generated substantial interest within the stakeholder groups and will enable future discussions around the next steps whilst also generating possible offshoots from the project.

The next phase of this project will be to exhibit the design concept to obtain feedback from the public and then a second survey will also be conducted. The stakeholder group of asset owners and regulators will continue to be engaged to assist with moving the project forward.

Key Learnings

- It is important to engage with stakeholders early to allow for collaboration in both the scope and delivery of the project.
- New applications of technology often create challenges for legal frameworks, and may require regulatory flexibility to deploy and pilot. Adaptation is cross disciplinary, and gaining understanding across professions on innovative approaches requires more time than is at first envisioned.
- This project demonstrated the absolute importance of connecting with the right people within large organisations. This was done by reaching out to Office of Environment and Heritage and LGNSW to engage government networks with the project as it proceeded.
- The objectives for this project are ambitious and broad. To move the project forward from design to implementation, clear communication and an engagement strategy with both the community and stakeholders will be vital and ensure the community is supportive and the impacts of the proposal are clearly understood.

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