

*Enhancing Water Quality and
Sustainability with Biochar*



Why Biochar in Water Management?

Biochar, a carbon-rich material produced through the pyrolysis of organic biomass, offers significant benefits for water management in Australia. Its porous structure and high surface area make it an effective tool for improving water quality, managing stormwater, and supporting sustainable water treatment practices.

watermanaustralia.com

Benefits of Using Biochar in Water Management

- **Environmental Sustainability:** Biochar production utilizes organic waste materials, reducing landfill usage and greenhouse gas emissions.
- biochar-us.org/stormwater-management
- watermanaustralia.com/biochar-based-sustainable-water-treatment-technology
- archive.biochar-us.org/learning
- **Cost-Effectiveness:** Implementing biochar-based solutions can lower operational costs in water treatment by reducing the need for chemical additives and energy-intensive processes.
- **Improved Water Quality:** Biochar enhances the removal of contaminants, leading to cleaner water bodies and healthier ecosystems.

Applications of Biochar in Water Management

1) Stormwater Management

- **Pollutant Filtration:** Incorporating biochar into stormwater filtration systems can effectively remove contaminants such as heavy metals, nutrients, and organic pollutants, thereby protecting aquatic ecosystems. biochar-us.org
- **Enhanced Water Retention:** Biochar's high porosity increases soil water holding capacity, reducing surface runoff and promoting ground water recharge.
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2) Wastewater Treatment

- **Adsorption of Contaminants:** Biochar can adsorb a wide range of pollutants from wastewater, including heavy metals and organic compounds, making it a cost-effective and sustainable treatment option.
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- **Nutrient Recovery:** Utilising biochar in treatment processes can capture nutrients like nitrogen and phosphorus, which can then be reused as soil amendments, promoting a circular economy.

3) Drinking Water Purification

- **Removal of Chemical Pollutants:** Biochar can be employed in low-cost drinking water treatment systems to remove chemical contaminants, ensuring safe and clean water supply. archive.biochar-us.org



Case Studies in Australia

- **Logan Water's Biosolids-to-Biochar Project**

Location: Logan, Queensland

Partners: Logan City Council, Logan Water, Downer, and ARENA

The Logan Water biosolids gasification project is the first of its kind in Australia, using advanced thermal treatment to convert human wastewater biosolids into biochar. This initiative was driven by the need to address increasing biosolids disposal costs, reduce greenhouse gas emissions, and improve resource recovery.

The facility processes 34,000 tonnes of biosolids annually, reducing greenhouse gas emissions by 6,000 tonnes CO₂-equivalent per year while producing biochar that can be repurposed for agricultural and land rehabilitation uses. The project has set a precedent for sustainable biosolids management and provides a model for municipalities worldwide looking to integrate biochar into their circular economy strategies.

- **PYROCO Technology Trials:**

South East Water, in partnership with RMIT University and other organizations, is trialing innovative pyrolysis technology to convert biosolids into biochar, aiming to scale up sustainable water management practices.

insidewater.com.au/next-generation-biochar-technology-inspiring-young-professionals/

Implementation Guidelines

- **Integration into Existing Systems:** Assess current water management infrastructures to identify opportunities for incorporating biochar, such as retrofitting filtration units or amending soils in stormwater basins.
- **Quality Control:** Ensure the biochar used meets industry standards for contaminant levels and structural properties to maximize effectiveness and safety.
- **Collaboration with Stakeholders:** Engage with local councils, water authorities, and community groups to promote the adoption of biochar-based solutions and share best practices.

REFERENCES AND FURTHER READING

1. US Biochar Initiative. "Stormwater Management." biochar-us.org
2. Waterman Engineers Australia. "Biochar Based Sustainable Water Treatment Technology." watermanaustralia.com
3. US Biochar Initiative. "A Field Guide to Biochar Water Treatment." archive.biochar-us.org
4. RMIT University. "Australian-first tech: next step in waste transformation innovation." www.rmit.edu.au/news/all-news/2021/jul/biosolids-tech-trial
5. Inside Water. "South East Water partnering with industry to scale-up biochar." insidewater.com.au/next-generation-biochar-technology-inspiring-young-professionals/

Conclusion

Biochar presents a versatile and sustainable approach to enhancing water management in Australia. By integrating biochar into stormwater systems, wastewater treatment, and drinking water purification, communities can improve water quality, promote environmental sustainability, and achieve cost savings.

NOTE: This fact sheet is designed for educational purposes and should be adapted to specific project requirements and local regulations.

Join ANZBIG today to access more resources and support for implementing biochar solutions in your water management practices.

