



# The role of treatment systems in improving water quality to the Great Barrier Reef

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# The main game(s)

- Protecting the long term health of the worlds largest coral reef ecosystem – The Great Barrier Reef (WHA)
- Total asset value reported in the order of \$60 billion.
- ~\$4 Billion annually to the Australian economy, supporting over 33,000 full-time Queensland jobs
- Incredible array of social, cultural and environmental values.



# Agri-business

- Agriculture accounts for around 80% of land use in Great Barrier Reef Catchments
- 8500 graziers, 3800 sugarcane growers, 1000 horticulture folk and around 925 grain growers
- Generates ~\$6.2 billion (GVP- 15 /16) and is the lifeblood of rural and remote communities
- **Enormous scope for development, diversification and growth**
- Accepted that it is a major source of diffuse pollutants to the Great Barrier Reef (sediment, nutrient and pesticide).



# Improving the business and environmental performance of agriculture

- First Integrated Catchment Management Group (ICM) – Innisfail
- SIIP's
- Construction of artificial wetlands in the Tully
- The late Dr Joe Baker's seminal report; set the precursor to the first iteration of the Reef Water Quality Protection Plan



# 23 years later .... A brave new world

- The Australian and Queensland Governments have invested over \$900 million from 2013-2024 to improve water quality entering the Great Barrier Reef
- Reef 2050 Long-term Sustainability Plan
- Reef 2050 Water Quality Improvement Plan
- Expanded to include all land-based pollutant sources
- End-of-catchment water quality targets (2025)
- **International audience scrutinising our efforts**

*What we have done with the best part of \$1 billion dollars, if it was made available in 1995?*



# Scientific Consensus 2017

- Progress towards water quality targets is slow.
- Current initiatives alone (Eg. BMP) will not meet targets.
- ~4 % of grazing land and ~14% of sugarcane land in reef catchments has been accredited to BMP standards
- Expanded scope of tailored and more innovative solutions urgently required.



# Treatment Train Elements

- Management skills and capacity
- Property planning
- Input efficiencies
- Source controls
- Transmission processes
- **Treatment of discharge**



# Treatment Systems

- A range of treatment systems available to attenuate / reduce sediment, nutrient and pesticides leaving farms and catchments
  - Tail water capture and re-use
  - Constructed wetlands
  - Bio-algal remediation
  - Bioreactors





# Challenges

- Maturity for specific approaches / technologies, particularly at a commercial scale, vary.
- Treatment efficiencies are also highly variable and dependent on factors such as temperature, nutrient loading, hydrology, hydraulic residence time – **RD&E to verify and prove performance in GBR catchments, tropical and dry tropical climes and farming systems**
- Increasing regional capacity and knowledge of treatment systems in Queensland.



# Opportunities

- Complement best management practice and systems based approaches to farming and catchment management
- Treatment systems are but one component of integrated approach to improving business and environmental performance, in particular water quality.
- Gaining grower confidence, clearly articulating what you are trying to achieve and having them directly involved (co-ownership) is essential.....advocacy and champions.

*How best to kill an innovative approach / idea ?*



*That's all Folks!*



# Closing Comments

- Once again welcome to this Regional Forum for Treatment Systems.
- Over the next two days you will have the opportunity to establish new or strengthen existing networks with people that have a genuine interest and expertise in treatment systems.
- You will hear about the latest research and trial work in the GBR catchment, including challenges and lessons learnt; and
- See first hand how treatment systems have been implemented and operated on different land uses and types
- I wish you all the very best for the balance of your forum and associated field visits.