



Belyuen Wastewater Treatment Ponds Performance Improvement Plan

2023

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Introduction

Discharges from the Belyuen Wastewater Treatment Ponds are regulated under conditions specified in Waste Discharge Licence WDL215-02, granted under Section 74 of the Water Act 1992.

An Improvement Plan may be required to support a WDL application under the Guidelines on Waste Discharge Licensing under the Water Act (NTEPA 2014). According to this guideline, “The Improvement Plan must be submitted as a demonstration of commitment to the reduction and/or elimination of discharge(s) through improved waste quality and processes. The Improvement Plan must focus on reducing the zone of impact or any declared mixing zone and progressively move towards the discharge quality not compromising any beneficial use declaration or relevant water quality criteria for the receiving waters.”

This updated Improvement Plan outlines a range of improvement strategies to be implemented in upcoming years to improve the performance, in terms of environmental outcomes, of Belyuen Wastewater Treatment Ponds. It is important to understand the context in which this improvement plan has been developed and that the implementation of the suggested improvement strategies are subject to many factors, not least of which is the appetite of the NT community and government toward investment in various treatment improvement options. Work on a new Water and Sewerage Funding and Tariff proposal has commenced and a submission is planned for April of 2023. This submission and ultimate decision will greatly influence planning judgments about, and the capacity of Power and Water Corporation (PWC) to deliver on, the improvement strategies outlined in this plan.

Future planning has identified that some of the remote waste water treatment ponds will be reaching treatment capacity in upcoming years. As such, all improvement options must be considered in this broader context. Competing treatment options for remote wastewater treatment ponds include hydraulic improvements to ponds, algal harvesting raceways, pond desludging and upgrades to existing ponds.

The Belyuen Wastewater Treatment Ponds are within the Darwin Harbour high water mark and natural waterways areas. The stakeholder declared beneficial uses under Section 73(1) of the Water Act for these include; protection of the environment, cultural (aesthetic, recreational and cultural) and aquaculture. The Beneficial Use declaration also specifies the objectives which apply in relation to water quality in the Darwin Harbour Region. The objectives are those specified in tables 8 and 9 of the report ‘Water Quality Objectives for the Darwin Harbour Region Background Document (DHWQO)’. Decisions about treatment improvement should be informed by risks to the receiving environment and to these beneficial uses and objectives. This risk based approach should be the foundation for decisions regarding improvement strategies outlined in this Improvement Plan.

Improvement Plan actions 2023

This action list is informed by input from across all of Water Services.

No.	Action item	Intended outcomes	Project Requirements/stages	Timeframe
1	Develop Remote Desludging Strategy	<ul style="list-style-type: none"> • Determine desludging priority • examine complexities • assess project risks • determine options for sludge/biosolids handling and storage • establish possible timeline of desludging for remote sites • identify and resolve constraints • secure funding 	Establish input desludging prioritisation triggers	2023 - 2025
			Determine input data required to inform decision making	
			Identify constraints ie – hardstands/hubs, lease areas	
			Data gathering - Modify and implement monitoring programs or pond capacity assessments as required.	
			Develop a rolling program prioritise sites and determine delivery strategy	
			Secure Capex and Opex Funding	
2	Investigate Environmental compliance point/s and SSTV investigation	Determine if establishing environmental compliance points and hence SSTV's is feasible and or necessary.	Site visits for ERA development – try to include NT EPA staff	2023 - 2025
			Assess possible compliance point locations and risk	
			Determine possible sampling program and estimate costs.	

Appendix 1 - Declared Beneficial Uses and Water Quality Objectives

The Beneficial Uses declared in 2022 (NTG G41 19 Oct 2022), under Section 73(1) of the Water Act NT for the region are:

- (i) protection of the environment;
- (ii) cultural (aesthetic, recreational and cultural);
- (iii) aquaculture

The Beneficial Use declaration also specifies the objectives which apply in relation to water quality in the Darwin Harbour Region. The objectives are those specified in tables 8 and 9 of the report 'Water Quality Objectives for the Darwin Harbour Region Background Document (DHWQO)'. Water quality objectives and Site Specific Trigger Values (SSTV's) outlined in Waste Discharge Licence WDL 215-02 are also informed by the ANZG (2018) Australian and New Zealand Guidelines for Fresh and Marine Water Quality.

Appendix 2 - Risk Based Approach to Continuous Improvement

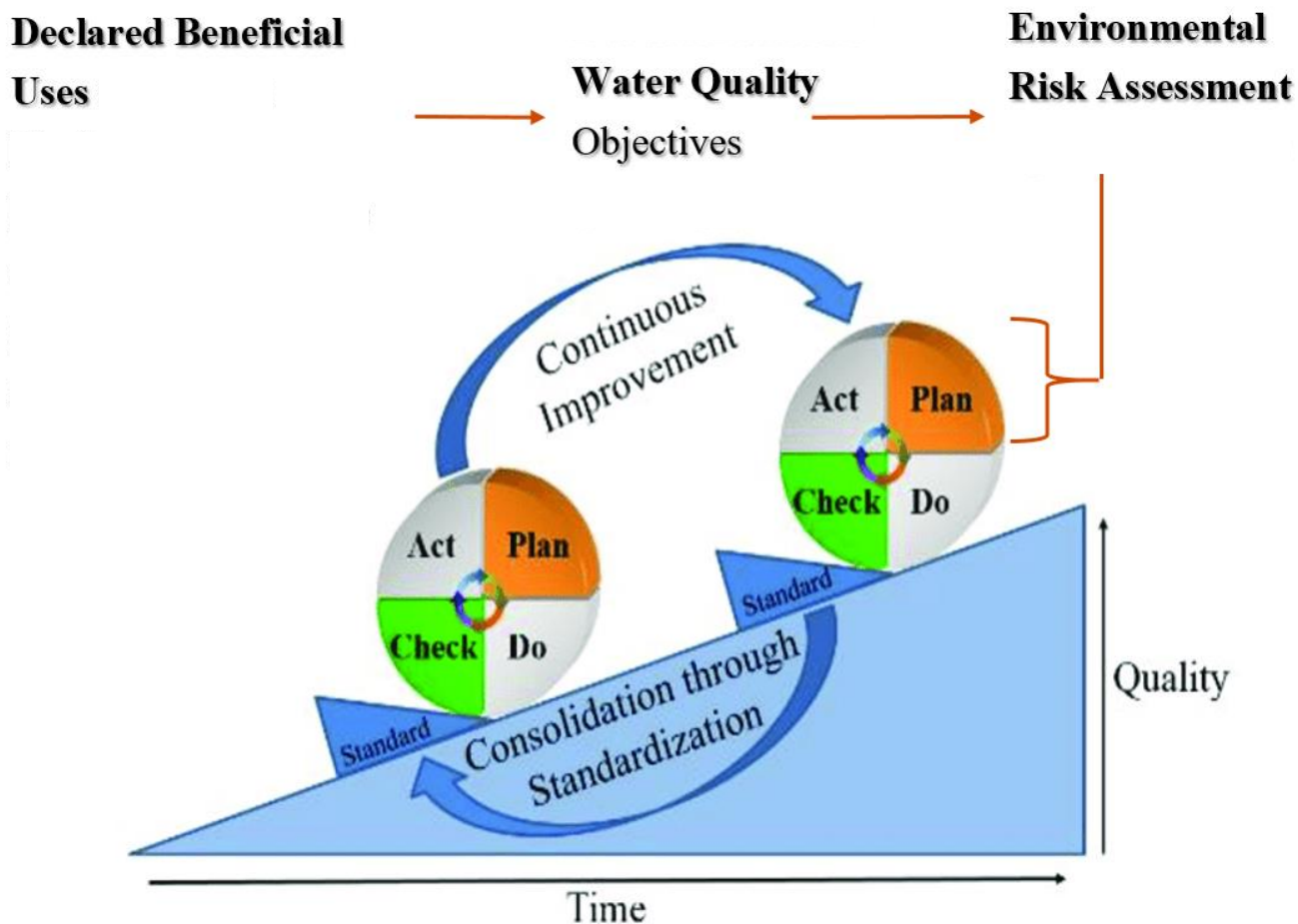


Figure 1: Plan, do, check, act continuous improvement cycle based on risk

Power and Water’s Environmental Management System (EMS) is maintained as per international standard ISO 14001 which advocates a plan, do, check and act cycle for continuous improvement.

Plan: Recognize an opportunity and plan a change.

Do: Test the change. Carry out a small-scale study.

Check: Review the test, analyse the results, and identify what you've learned.

Act: Take action based on what you learned in the study step.

Improvement strategies, which fall within the “plan” stage of the continuous improvement cycle for the discharge, are informed by risk to the Declared Beneficial uses, guided and assessed by the Water Quality Objectives (ANZG 2018).

Environmental Risk of the discharge

An updated environmental risk assessment for the receiving environment of the discharge was undertaken by PWC in 2023 (D2023/131548). Findings of the risk assessment include:

- the ERA process has determined that the discharge from the Belyuen WwTP poses a low to high risk to the identified beneficial uses of the receiving waterway.
- the influence of the intermittent discharge on the receiving environment is considered sustainable within the well-flushed macro-tidal estuary and large catchment area.
- based on this ERA and water quality data, there is limited evidence to suggest deleterious impacts to the receiving environment.

Compliance and Regulatory Risk

In recent communications with PWC, the NTEPA highlighted a potential cultural change in the organisation toward more routine dispensing of infringement notices and fines available to the administering agency as regulatory instruments under the Water Act. The NTEPA indicated a much lower tolerance in the future for breaches of licence conditions, particularly in instances of repeated similar breaches. The financial implications of regulatory changes either to legislative acts or the changing culture of regulatory authorities combined with the financial implications of regulatory non-compliances must be considered when making decisions regarding improvement options at Belyuen Wastewater Treatment Plant. Failure to appropriately act on risks can have profound financial implications. In Power and Water's 2021-2022 Statement of Corporate Intent (SCI) a key performance indicator up to 2024-2025 includes a target each year of zero (0) significant environmental compliance issues.

Section 16 of the Water Act prohibits pollution and prescribes associated environmental offences, ranging from level 1 to level 4. In summary, it is an environmental offence, for a person to allow waste to come into contact with water, or to pollute water, unless it is authorised under the Act (under a waste discharge licence), or any other law in force in the Territory.

The penalty for an environmental offence is defined under the Environmental Offences and Penalty Act and is in the order of:

- for an individual between a maximum of \$11, 088 and \$55, 440 or up to 5 years imprisonment plus a victims level; or
- for a body corporate between a maximum of \$55, 440 and \$2, 770, 560 plus a victims levy.

Under section 104 of the Water Act, a default penalty may also be applied in the event that an offence continues after a complaint alleging the commission of that offence has been lodged with the court.

Under section 16 of the Act, a default penalty of \$500 for an individual, or \$2500 for a body corporate, applies.

The default penalty is applied for each day the offence continues.

Under section 76 of the Act, it is an environmental offence (level 3) for the holder of a waste discharge licence to contravene (or cause, suffer or permit a person to contravene) a term or condition to which the licence is subject.

The penalty for an environmental offence (for each offence) level 3 is in the order of:

- for an individual between \$11, 088 and \$110, 880 plus a victims level; or
- for a body corporate between \$55, 440 and \$554, 400 plus a victims levy.

A default penalty of \$500 for a person or \$2500 in the case of a body corporate may also be applied.

Appendix 3 - Cost considerations in Wastewater treatment

Decisions about wastewater treatment improvement options are not made in a bubble. Any strategy for improvement to the discharge comes with an associated cost that must be ultimately paid by taxpayers through water and sewerage tariffs. As such, all options for improvements to the discharge should be assessed against the risks to the declared beneficial uses and taking into consideration the cost to taxpayers. This cost vs benefit informed by risk is a balancing act that specialist treatment engineers at PWC must manage. In terms of environmental outcomes, improvements in the wastewater treatment industry are not linear. There is a tendency for large gains after significant upgrades to or replacement of, ageing infrastructure, followed by a period of decline as the infrastructure ages and approaches or exceeds design capacity with increasing population. But the overall trend should be toward improved environmental outcomes, providing appropriate funds are committed, as displayed in figure 2 below. Considered in the broader context, across the various treatment sites, wastewater treatment in the Northern Territory is currently positioned toward the latter end of one of these cycles and significant investment will be required in the near future to ensure continuous improvement.

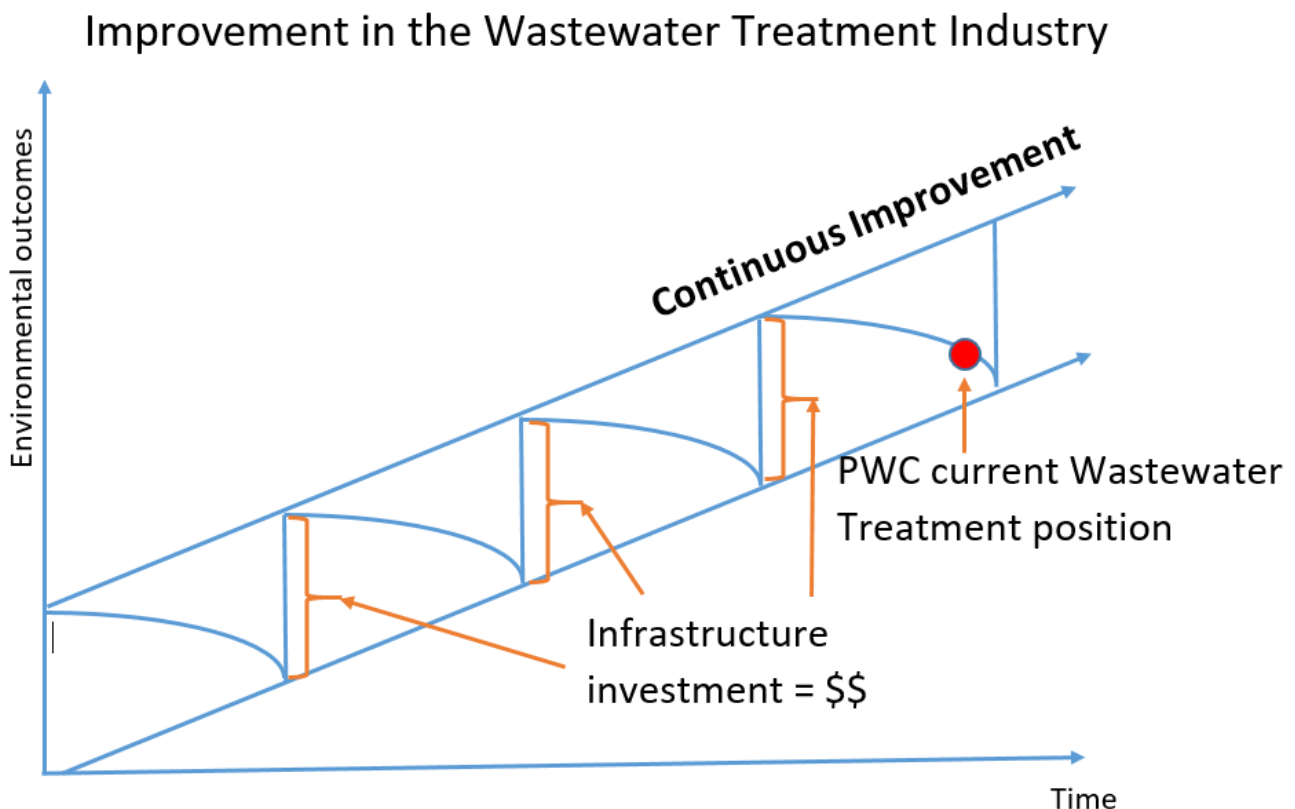


Figure 2: Improvement in the wastewater treatment industry

PWC Statement of corporate Intent

In accordance with the Government Owned Corporations Act, Power and Water's objectives are to:

- Operate at least as efficiently as any comparable business; and
- Maximise the sustainable return to the Northern Territory Government on its investment in the Corporation.
- Renewal/Replacement: Upgrade of current asset infrastructure to meet optimum levels of service.
- Service Improvement: Improve the efficiency of service delivery.
- Compliance: Meet regulatory and licencing requirement