Government of Western Australia
Department of Water and Environmental Regulation

Decision Report

Application for Works Approval

Part V Division 3 of the *Environmental Protection Act 1986*

Works Approval Number	W3012/2025/1
Applicant	Water Corporation
File number	APP-0028996
Premises	Bridgetown Water Resource Recovery Facility #2 HESTER BROOK WA 6255 Legal description Lot 10438 on Deposited Plan 153767 As defined by the premises maps attached to the issued works approval
Date of report	11 September 2025
Decision	Works approval granted

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1. Decision summary

This decision report documents the assessment of potential risks to the environment and public health from emissions and discharges during the construction and operation of the premises. As a result of this assessment, works approval W3012/2025/1 (W3012) has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this decision report, the Department of Water and Environmental Regulation (the department; DWER) has considered and given due regard to its regulatory framework and relevant policy documents which are available at https://dwer.wa.gov.au/regulatory-documents.

2.2 Application summary and overview of premises

On 7 May 2025, the applicant submitted an application for a works approval to the department under section 54 of the *Environmental Protection Act 1986* (EP Act) for the Bridgetown Water Resource Recovery Facility (WRRF), which currently comprises an Oxidation Ditch-type activated sludge plant, multimedia filtration and a chlorine disinfection plant, two lined sludge drying beds and an irrigation storage dam. Treated wastewater (TWW) is discharged to the Bridgetown Golf Course (BGC). The WRRP currently operates under Licence L7440/1998/7 (L7440).

The application is to undertake construction works relating to the addition of a Rotating Dynamic Disk Filter (RDDF) at the premises. In 2017, the WRRF aeration upgrade was undertaken to provide an optimised process configuration, aeration and control to ensure nutrient removal and minimise solid loss to the dam. The upgrade was unable to achieve expected TWW quality. Due to filamentous bacteria, TWW Total Suspended Solids (TSS) consistently exceeded 30 mg/L and operations noticed sludge build-up in the clarifier section of the new plant. The process was reseeded without success and solids retention remained an ongoing problem. Inadequate retention of process solids from the TWW was contributing to excess solids discharged to, and promotion of algal growth in the irrigation storage dam. Consequently, the algae required chemical treatment to ensure that suspended solids did not exceed the golf club reuse system filtration capacity.

Several potential solutions to control the settlement issue have been trialled by the applicant. A RRDF phase -separation system that functions as a dynamic microfilter was found to provide the most effective retention of biomass in the process and the highest quality of TWW. A pilot trial of an 8 m^2 (4 disks x 2m^2) RDDF system was authorised under a licence amend to Existing Licence L7440/1998/7 (L7440) which was granted in 2021. Over the period 16 February to 22 April 2021, the RDDF pilot system produced TWW with an average TSS of 32 mg/L and following further refinement, produced TWW with an average TSS of 17 mg/L over the period 16 September to 16 November 2021.

The applicant now proposes to upgrade the WRRF by installing a 24 m^2 (8 disks x 3 m^2) RDDF system to replace the existing internal clarifier. The high quality of the RDDF TWW will enable optimisation of the existing TWW re-use scheme. TWW from the RDDF will be disinfected and stored in a new contact tank for direct supply to the BGC. Any excess water will be stored in the dam and provided for reuse if required by BGC, after filtration, disinfection and blending with RDF TWW in the new contact tank.

The following infrastructure is proposed to be constructed and operated for the upgraded WRRF:

- 24 m2 RDDF (8 disks x 3 m^2) comprising a feed pumpstation including aeration, concrete

RDDF tanks and RDDF backwash system.

- Existing clarification zone to be retained as ‘emergency off-line storage zone’. This is part of the oxidation ditch structure so cannot be removed.
- New bunded chemical storage and dosing systems for Polyaluminium chloride (PACL) and liquid Sodium Hypochlorite. The existing Sodium Aluminate storage and dosing system replaced with PACL storage and dosing system. The chemical is required both for filter system performance and chemical phosphorus removal. the addition of a new Sodium Hypochlorite storage and dosing system for filter backwashing and site reuse water disinfection.
- New service water storage tanks and relocated service water pumpstation.
- Relocated potable water storage and pressure supply system for operations building and safety eyewash stations.
- New 300 kL contact tank located adjacent to existing TWW reuse facility at the base of the irrigation storage dam. Existing gas chlorination system will be reconfigured to discharge into this tank.
- Civil works, interconnecting pipework, values, electrical, instrumentation, control and operational technology infrastructure to facilitate integration and operation of the new facility.

The applicant intends to install the RDDF systems as a separate fixed structure and decommission the internal clarifier. The clarifier will be retained as emergency storage. Figure 1 provides an overview of the proposed upgrades to the WRRF, and these will be taken off-line and will not materially impact normal operations.

The process flow for the upgraded WRRF as shown in Figure 1 is as follows:

- Inflow will be directed from the Inlet Works into the oxidation ditch reactor.
- Mixed liquor is pumped from the oxidation ditch to the RDDF system for phase separation of biomass and TWW.
- TWW from the RDDF will either be:
    - Discharged to the 200 kL Contact Tank for disinfection and storage, before reuse by BGC (in drier months), or
    - Discharged to the irrigation storage dam to be stored until required. If extra TWW is requested by BGC, stored TWW will be discharged to the existing 54 kL balance tank and filtered passed through the existing Multimedia Filters before transfer to the Contact Tank for reuse.
    - Used to fill RDDF backwash tank and site service water tank.
- Sludge from the RDDF will be recycled to the aerobic zone of the oxidation ditch and Return Activated Sludge (RAS) as per the existing clarification system.
- Excess process solids (sludge) will continue to be directed to the sludge lagoons for stabilisation and periodic dewatering before removal to a suitably licensed landfill.
- Supernatant from the sludge lagoons will continue to be recycled to the treatment plant.

Environmental Commissioning of the upgraded WRRF will be required for testing and optimising RDDF operations to ensure the TWW will achieve an average TSS of 20 mg/L. The following Environmental Commissioning activities will be required:

- Reliability test for 30 days – all systems set to auto, no intervention by an operator.
- Process proving for 60 days – optimisation of systems settings, such as RDDF speed, RAS rates, backwash frequency and air scour frequency.
- Performance testing for 60 days – testing of optimised facility on auto, routine operator intervention only, to confirm systems meet performance specifications.

During commissioning it is expected the WRRF will discharge up to 520 kL per day as per existing licence's (L7440) production and design capacity. Sampling methods conditioned under licence L7440 will be used to monitor emissions during commissioning.

The applicant has applied for Time-limited operations also as part of the works approval application. The standard 180 days for Time-limited operations will be applied.

The premises relates to the category / categories and assessed production / design capacity under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations) which are defined in works approval W3012. The infrastructure and equipment relating to the premises category and any associated activities which the department has considered in line with *Guideline: Risk Assessments* (DWER 2020) are outlined in works approval W3012.

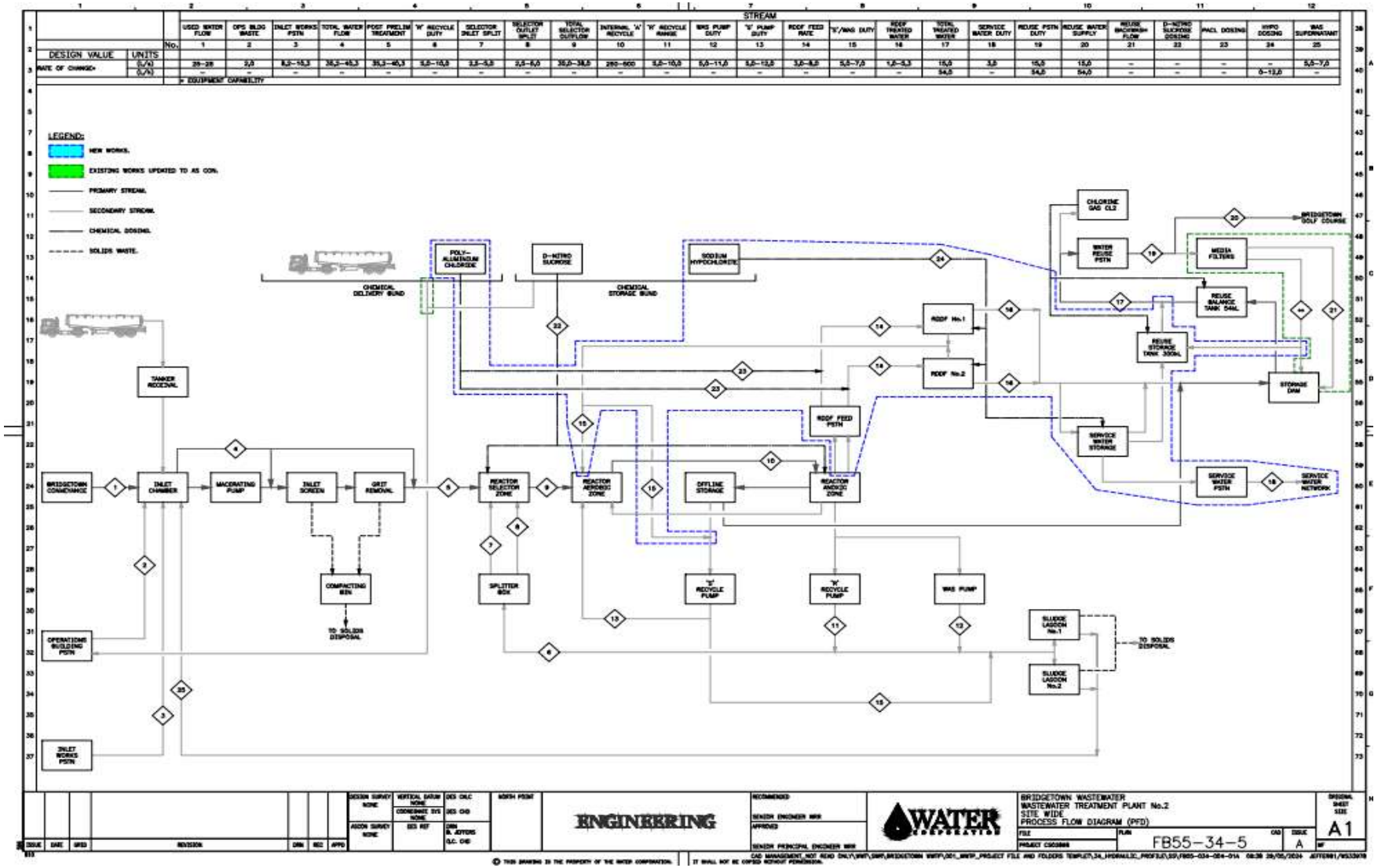

Figure 1: Proposed upgrades

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3. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guideline: Risk Assessments* (DWER 2020).

To establish a risk event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction / operation which have been considered in this decision report are detailed in Table 1 below. Table 1 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Table 1: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Construction of RDDF, vehicle movements, earthworks etc.	Air / windborne pathway	Majority of construction occurs on hardstand area. Vehicle speed limit is 20 km/hr. Regular dust suppression of unsealed areas.
Noise			Compliance with *Environmental Protection (Nosie) Regulations 1997* (Nosie Regs). Construction activity to only occur between the hours 7am to 7pm – Monday to Saturday.
Operation including Commissioning and Time-limited operations			
Dust	Operation of the RDDF	Air / windborne pathway	Majority of operations to occur on hardstand area. Vehicle speed limit is 20 km/hr.
Noise			Compliance with Nosie Regs.
Odour			Treatment process includes extended aeration of the wastewater which reduces odour. Continue to facilitate drying of the sludge with reduces odour.
Discharge of TWW / sludge		Seepage to soil and groundwater	WRRF to include WDDF. Monitoring of TWW – existing licence conditions. Existing lined sludge ponds.

Emission	Sources	Potential pathways	Proposed controls
			Sludge returned to WRRF. Sludge removed off-site to a licensed landfill premises.
Spills / leaks		Overland runoff and Seepage	Hardstand constructed to meet not less than 1 x 10-8 m/s permeability with bunds. Hazardous chemicals and hydrocarbons stored in accordance with AS1940 and AS 3780. Spill kits, containment and recovery equipment and emergency procedures. Waste products stored in bins and removed from premises. Regular maintenance of infrastructure.
Contaminated stormwater		Overland run-off and seepage	Chemical storage areas bunded so stormwater directed away.

3.1.2 Receptors

In accordance with the *Guideline: Risk Assessment* (DWER 2020), the Delegated Officer has excluded the applicant's employees, visitors, and contractors from its assessment. Protection of these parties often involves different exposure risks and prevention strategies, and is provided for under other state legislation.

Table 2 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises *(Guideline: Environmental Siting* (DWER 2020)).

Table 2: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	Distance from prescribed activity
Residential	150 m south of premises boundary
Farming	Adjacent and west and north of premises
Bridgetown Golf Course	Adjacent southeast of premises
Environmental receptors	**Distance from prescribed activity**
Threatened Fauna	• *Phascogale tapoatafa wambenger* 1.8 km southeast • *Calyptorhynchus sp*. Carnaby's cockatoo 'white-tailed black cockatoo' 2.5 km east • *Tyto novaehollandiae* 1.3 km north
<u>Surface waterbodies</u> Hester Dam Catchment Hester Brook/Dalgarup Brook	~ 800 m east of the site ~ 1.8 km west of the site ~ 1.6 km south-east

Unnamed surface waterbody	
Public Drinking Water Source Area	800 m east – Hestor Dam
Groundwater	5 – 22 mbgl

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for each identified emission source and takes into account potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the applicant has proposed mitigation measures/controls (as detailed in Section 3.1), these have been considered when determining the final risk rating. Where the delegated officer considers the applicant's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the works approval as regulatory controls.

Additional regulatory controls may be imposed where the applicant's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 3.

Works approval W3012 that accompanies this decision report authorises construction and time-limited operations. The conditions in the issued works approval, as outlined in Table 3 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

A licence amendment is required following the time-limited operational phase authorised under the works approval to authorise emissions associated with the ongoing operation of the premises. A risk assessment for the operational phase has been included in this decision report, however licence conditions will not be finalised until the department assesses the licence application.

Table 3: Risk assessment of potential emissions and discharges from the premises during construction, commissioning and operation

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of works approval	Justification for additional regulatory controls
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Construction								
Construction of WDDF and associated equipment including vehicle movements (reversing beepers).	Dust	Air / windborne pathway causing impacts to health and amenity	Residences 150 m south	Refer to Section 3.1	C = Slight L = Unlikely **Low Risk**	Y	N/A	The Delegated Officer has considered the scale of the works and the separation distance between the source and receptors and considers that dust emission impacts are not foreseeable. Dust can be adequately regulated by section 49 of the EP Act.
	Noise			Refer to Section 3.1	C = Slight L = Unlikely **Low Risk**	Y	N/A	The Delegated Officer has considered the separation distance between the source and receptors and considers that impacts from noise emissions are not foreseeable. Noise emissions are adequately regulated under the Noise Regulations.
Commissioning								
Commissioning of WRRF and associated equipment including vehicle movements (reversing beepers).	Dust	Air / windborne pathway causing impacts to health and amenity	Residences 150 m south	Refer to Section 3.1	C = Slight L = Unlikely **Low Risk**	Y	N/A	The Delegated Officer has considered the scale of the works and the separation distance between the source and receptors and considers that dust emission impacts are not foreseeable. Dust can be adequately regulated by section 49 of the EP Act.
	Nosie			Refer to Section 3.1	C = Slight L = Unlikely **Low Risk**	Y	N/A	The Delegated Officer has considered the separation distance between the source and receptors and considers that impacts from noise emissions are not foreseeable. Noise emissions are adequately regulated

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of works approval	Justification for additional regulatory controls
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
								under the Noise Regulations.
	Odour			Refer to Section 3.1	C = Slight L = Unlikely **Low Risk**	Y	N/A	The Delegated Officer has considered the scale of the works and the separation distance between the source and receptors and considers that odour emission impacts are not foreseeable. Odour can be adequately regulated by section 49 of the EP Act.
	Discharges of TWW / Sludge	Discharge to land and subsurface seepage causing contamination of soil, degradation of groundwater quality and impacts to downgradient receptors	Groundwater 5 – 22 mbgl	Refer to Section 3.1	C= Moderate L= Unlikely **Medium** Risk	Y	Existing licence condition 6, 12 and 13.	The Delegated Officer considers existing conditions and Licence Holder controls sufficient to manage risk.
	Spills / Leaks	Direct discharge to land and groundwater	Dam 800 m east Groundwater 5 – 22 mbgl	Refer to Section 3.1	**C= Moderate** **L= Unlikely** **Medium Risk**	Y	Existing licence condition 4 and 5	The Delegated Officer considers existing conditions and Licence Holder controls sufficient to manage risk.
	Contaminated stormwater	Overland runoff potentially causing ecosystem disturbance or impacting surface water quality	Dam 800 m east	Refer to Section 3.1	C = Slight L = Unlikely **Low Risk**	Y	Existing licence condition 6	The Delegated Officer considers existing conditions and Licence Holder controls sufficient to manage risk.

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of works approval	Justification for additional regulatory controls
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Operation (including time-limited-operations operations)								
Operation of WRRF and associated equipment including vehicle movements (reversing beepers).	Dust	Air / windborne pathway causing impacts to health and amenity	Residences 150 m south	Refer to Section 3.1	C = Slight L = Unlikely **Low Risk**	Y	N/A	The Delegated Officer has considered the scale of the works and the separation distance between the source and receptors and considers that dust emission impacts are not foreseeable. Dust can be adequately regulated by section 49 of the EP Act.
	Noise			Refer to Section 3.1	C = Slight L = Unlikely **Low Risk**	Y	N/A	The Delegated Officer has considered the separation distance between the source and receptors and considers that impacts from noise emissions are not foreseeable. Noise emissions are adequately regulated under the Noise Regulations.
	Odour			Refer to Section 3.1	C = Slight L = Unlikely **Low Risk**	Y	N/A	The Delegated Officer has considered the scale of the works and the separation distance between the source and receptors and considers that odour emission impacts are not foreseeable. Odour can be adequately regulated by section 49 of the EP Act.
	Discharges of TWW / Sludge	Discharge to land and subsurface seepage causing contamination of soil, degradation of groundwater quality and impacts to downgradient	Groundwater 5 – 22 mbgl	Refer to Section 3.1	C= Moderate L= Unlikely **Medium** Risk	Y	Existing licence condition 6, 12 and 13.	The Delegated Officer considers existing conditions and Licence Holder controls sufficient to manage risk.

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of works approval	Justification for additional regulatory controls
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
		receptors						
	Spills / Leaks	Direct discharge to land and groundwater	Dam 800 m east Groundwater 5 – 22 mbgl	Refer to Section 3.1	C= Moderate L= Unlikely **Medium** Risk	Y	Existing licence condition 4 and 5	The Delegated Officer considers existing conditions and Licence Holder controls sufficient to manage risk.
	Sediment laden stormwater	Overland runoff potentially causing ecosystem disturbance or impacting surface water quality	Dam 800 m east	Refer to Section 3.1	C = Slight L = Unlikely **Low Risk**	Y	Existing licence condition 6	The Delegated Officer considers existing conditions and Licence Holder controls sufficient to manage risk.

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk Assessments* (DWER 2020).

Note 2: Proposed applicant controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

4. Consultation

Table 4 provides a summary of the consultation undertaken by the department.

Table 4: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website on 28/07/2025	No comments received	Noted.
Local Government Authority advised of proposal on 11/07/2025	Shire of Bridgetown – Greenbushes did not respond.	Noted.
Department of Health (DoH) advised of proposal on 11/07/2025	DoH provided a response on 3 September 2025 advising: In relation to wastewater management and the upgrading works proposed, the DoH has no objection to these works as proposed. Please be advised, the Department of Health has not had all the information/resources to fully review this specific system and is therefore unable to make comment as to peak and non-peak specifications, water quality criteria, site and soil evaluations, engineering Certifications and other regulated criteria as submitted by the proponent. However, the DoH will be monitoring the water quality criteria and processes as part of the ongoing recycled water quality auditing program. The Recycled Water Scheme Approval, File No. F-AA15965, will be required to be updated by the proponent and sent to the DoH. A separate approval will be required from the Chief Health Officer with the updated treatment and infrastructure information and management practices as part of the Recycled Water Scheme Approval conditions.	Noted.
Applicant was provided with draft documents on 15 July 2025.	The Applicant requested an extension to comment until 15 August 2025. Comments provided 10 September 2025. Refer to Appendix 1.	Refer to Appendix 1

5. Conclusion

Based on the assessment in this decision report, the delegated officer has determined that a works approval will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

References

Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.

1. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
2. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.

Appendix 1: Summary of applicant's comments on risk assessment and draft conditions

Decision Report	Summary of applicant's comment	Department's response
Page 1	(Bridgetown *Gold* course) – amend to Golf.	Typo amended
Conditions	**Summary of applicant's comment**	**Department's response**
Page 2	Works approval history Add (RDDF) in the summary of changes after Rotating Dynamic Disk Filter.	Amended.
Condition 1 Table 1	Amend to: a) New RDDF facility, able to treat up to 520m³/day, must be comprised of the following: (i) Feed pump station including aeration; (ii) 24m² filter disc system, complete with mixing and scour aeration, installed in two concrete tanks (iii) Filter backwash systems; iv) Bunded chemical storage and dosing systems for: • Poly-aluminium chloride • Sodium Hypochlorite v) Service water storage tank and relocated service water pumpstation; (vi) 300 kL reuse contact tank for chlorine disinfection; and (vii) Associated ancillary services, interconnecting pipework, valves, electrical instrumentation and control and operational technology. b) New RDDF facility, must be able to treat sewage to the following discharge limit: (i) Total suspended solids (TSS) <20 mg/L.	Amended – no fundamental changes between previous condition wording.

Decision Report	Summary of applicant's comment	Department's response
	c) Above ground infrastructure must be located on a concrete hardstand. d) All sewage storage and treatment tanks, vessels, transfer pipelines and conveyance infrastructure must be impermeable and free of leaks or defects. e) Must be constructed to prevent stormwater from entering the sewage treatment system and storage infrastructure.	
Condition 16 Table 8	pH[1] pH has a 1 next to it, but there's no footnote. Usually a Non-NATA accredited analysis (in field) is referenced below the table.	Footnote added
Definitions	Deleted licence and add works approval	Amended.
Definition	Suitably qualified engineer.	Font amended