Government of Western Australia
Department of Water and Environmental Regulation

Amendment Report

Application for Licence Amendment

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

Licence Number	L9034/2017/1
Licence Holder	Water Corporation
File Number	DER2017/000181
Premises	Advanced Water Recycling Plant Ocean Reef Road, CRAIGIE WA 6025 Legal description – Part of Lot 8278 on Plan 30778 As defined by the coordinates in Schedule 1 of the amended Licence.
Date of Report	9 April 2024
Decision	Revised licence granted

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A/MANAGER WASTE INDUSTRIES
REGULATORY SERVICES
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

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1. Decision summary

Licence L9034/2017/1 is held by Water Corporation (Licence Holder) for the Advanced Water Recycling Plant (AWRP) (the Premises), located on Part of Lot 8278, Ocean Reef Road, Craigie.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during operation of the Premises. As a result of this assessment, Revised Licence L9034/2017/1 has been granted.

The Revised Licence issued as a result of this amendment consolidates and supersedes the existing Licence previously granted in relation to the Premises. The Revised Licence has been granted in a new format with existing conditions being transferred, but not reassessed, to the new format.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this Amendment Report, the department 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

The Licence Holder is authorised under existing Licence L9034/2017/1 to further treat secondary-treated wastewater from the Beenyup Wastewater Treatment Plant (WWTP) (Licenced under L7882/1992/14) to drinking water standards (Recycled Water) and inject (recharge) 28 GL annually of this Recycled Water into the Leederville and Yarragadee aquifers, with wastes discharged to the marine environment.

On 28 September 2022, the Licence Holder submitted an application to the department to amend Licence L9034/2017/1 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

- The closing out of commissioning conditions currently on the Licence (conditions 16, 17, 18 and 19) to allow operation of the Stage 2 groundwater recharge bores at the premises;
- Authorisation on the licence for the ongoing remediation of the recharge bores as required over the operational life of the bores so that the bores may continuously achieve the required discharge rates; and.
- An extension to the submission date for the noise assessment report required under condition 3 of the Licence.

No other changes to the aspects of the existing Licence relating to Category 54 have been requested by the Licence Holder.

2.3 Background

The Stage 2 groundwater bores (LRB4, YRB2, LRB5 and YRB3) were constructed under works approval W6070/2017/1. The Licence Holder provided construction compliance reports for these bores on 9 August 2019 and 29 January 2020, with DWER providing documentation to the Licence Holder on 14 February 2020 confirming that the bores were complaint with design specifications outlined in the works approval. Due to a delay in the Licence Holder obtaining necessary Department of Health approval for the groundwater recharge, commissioning of these bores could not commence at this time. As such, commissioning requirements for the Stage 2 bores were included into the existing Licence through an amendment, which was

granted by DWER on 5 May 2020.

Two subsequent amendments were granted to the Licence Holder on 23 September 2020 and 20 April 2021, with both issued to extend timeframes for the commissioning period of the Stage 2 recharge bores and to undertake a noise assessment relating to the operation of the AWRP. The extension to these timeframes was required due to delays in commissioning the recharge bores. Initial investigation by the Licence Holder determined that recharge rates were lower than excepted and investigative works were required to identify and rectify any issues. Noise monitoring was also delayed so that it could be undertaken once the plant was able to reach full production.

2.4 Proposed amendments

2.4.1 Removal of commissioning conditions – operation of Stage 2 bores

The Environmental Commissioning Report (ECR) for the Stage 2 recharge bores required by condition 19 of the existing Licence was submitted to DWER as supporting documentation to inform this amendment. As such, DWER has undertaken a review of the ECR concurrently with the assessment of this amendment and has used the findings of this review to inform the assessment.

The Licence Holder commenced commissioning at the southern recharge site in February 2022, with the aim of commissioning to ensure that the recharge bores were able to sustainably meet operational needs, by progressively increasing recharge rates until the target recharge rate of between 130L/s and 150L/s, which is required to achieve the ultimate stage 2 capacity 14GL/year. The commissioning period consisted of:

- Installation and commissioning of down-hole infrastructure;
- Gravity Injection phase; and
- Pumped injection phase

At the completion of the commissioning period the following results were obtained:

- One bore (YRB2) had reached target recharge rates and was considered fully commissioned and is recharging water;
- Three bores had not been able to reach the target rate (LRB4, LRB5 and YRB3);
- The LRB4 and LRB5 bores continued to recharge at a reduced rate under gravity flow; and
- The YRB3 bore is continuing to recharge at a reduced rate under gravity flow.

On receipt of this information, the Licence Holder then undertook further review of the recharge commissioning data and conducted a water balance assessment. From this additional information, the Licence Holder determined that the recharge rates achieved across both the stage 1 and 2 bores is sufficient to inject more water than the AWRPs are currently producing, as during the study the two AWRP's were producing around 23GL/year or recycled water and, as of September 2022, the Stage 1 and 2 recharge bores could recharge over 25GL/year.

As such, from the data obtained the Licence Holder has determined that operations needs are being met and considers all bores to now be operational.

Key finding: In reviewing the Environmental Commissioning report provided by the Licence Holder against the requirements of Condition 19 of the existing Licence, the Delegated Officer notes the following:

1. A report on final remediation, lessons learnt and recommendations for future injection wells has been completed by the Licence Holder. However, the provision of original monitoring data appears to satisfy the requirements of Condition 19. Should DWER

require additional information on the recharge bores to inform future assessments, this report may be requested.

2. Monitoring data for feed water volumes, reject water disposal volumes and ambient aquifer pressure was provided and reviewed, with no exceedances against existing Licence criteria noted.
3. Design specifications and environmental performance of infrastructure have already been provided and reviewed by DWER in accordance with the requirements of Works Approval W6070/2017/1 for the premises. As such, whilst this information is required under Condition 19, the Delegated Officer considers this unnecessary duplication and that these requirements have already been demonstrated.
4. The Licence Holders commissioning results and determinations appear adequate to permit the ongoing operation of the recharge bores. As such is it deemed appropriate to remove redundant commissioning conditions from the Licence.

2.4.2 Recharge bore remediation

The Licence Holder has advised that they initially attempted to commence the commissioning period in July 2020, however the flow rates that were achieved during gravity testing were well below what was expected (8 L/s compared with the required start up rate of 23 L/s). Commissioning was halted in February 2021 to allow the Licence Holder time to investigate why the low flow rates were occurring, which included:

- the removal of down-hole infrastructure;
- visual camera inspections of each bore to verify conditions down hole conditions of the valves and instruments; and
- engagement of a third party to review performance issues and investigate the cause.

The investigation concluded that low flow rates were likely the result of clogging of the bore/aquifer interface due to remnant drilling fluids. A series of laboratory tests were then conducted to try and recreate the clogging issue, then determine a solution to break down the filter cake which had formed at the bore/aquifer interface. The application of a synthetic acid was identified as suitable to remove the filter cake, and subsequently a field trial for the filter cake removal was undertaken on four sections of two bores, which used either mechanical treatment only, or a combination of the synthetic acid and mechanical treatment. Results indicated that the mechanical treatment only was the most successful in remediating the bores, and the Licence Holder conducted mechanical treatment on each of the bores starting in early 2022. This treatment rectified the issue and commissioning was able to commence shortly afterwards.

As a result of the initial clogging of the bores, the Licence Holder has determined that bore remediation may be required over the life of all the bores in order to maintain their ability to achieve the required recharge rates. The Licence Holder proposes to use a combination of the mechanical only / synthetic acid and mechanical methods as deemed appropriate for bore specific remediation. The remediation method will align with bore development and maintenance methods described in the Minimum Construction Requirement for Water Bores in Australia (NUDCL, 2020).

Any fluids used for remediation that are not compliant with AS4020 (Standard for products for use with drinking water) will be removed from the bore and disposed of in an appropriate manner.

The Licence Holder considers remediation in this manner as normal maintenance that is often undertaken on groundwater bores at other premises across the state.

Key finding: Section 53(1)(g) of the EP Act permits alterations to a prescribed premises which may cause an emission in the course of and for the purpose of general maintenance required to maintain the efficient operations of any pollution control equipment or procedure.

Whilst there is precedence within the EP Act to permit bore remediation, the Delegated Officer will also include a condition on the revised Licence to authorise ongoing bore remediation as required. This will provide assurance to the Licence Holder that bore remediation is a permissible activity at the premises.

2.4.3 Removal of noise assessment conditions – DWER initiated

The Licence Holder has been granted an extension to the submission date for the noise assessment report required under condition 3 of the existing Licence on two previous occasions, being through the 23 September 2020 and 20 April 2021 amendments. These extensions have historically been required as the noise assessment can only be undertaken during the commissioning period so as to consider all noise generating activities occurring together, and the commissioning period was delayed due to the investigation of the low flow rates and subsequent bore remediation being required.

With the completion of commissioning and the submission of this amendment, the Licence Holder has requested another extension to the submission date for the noise assessment report from June 2022 to November 2022. Noting that this amendment application was submitted on 28 September 2022, the Licence Holder was given the following advice by DWER prior to the amendment application being accepted:

- Giving regard to current DWER licensing assessment timeframes, the revised Licence for the AWRP may not be finalised before the end of November. Should the amended Licence not be finalised by this time, amending the noise monitoring submission date to before the end of November will be redundant.
- If there is any anticipated delay with the completion and/or submission of the noise assessment report, then a later submission date may be more practical to include in the amended noise monitoring conditions.
- If it is anticipated that the noise monitoring report is likely to be finalised and submitted to DWER prior to the finalisation of this amendment application, then any subsequent amendments to licence conditions required as a result of monitoring report findings may be able to be incorporated into the Licence under this amendment application, pending a review of the noise monitoring assessment being undertaken.

In response to this advice, the Licence Holder submitted the noise assessment report for consideration under this amendment on 12 December 2022. The noise compliance assessment was based on the attended noise monitoring at four of the nearest noise sensitive (residential) receivers around the AWRP Stage 1 and 2. The monitoring was conducted on two nights - 7 September and 20 October 2022 - when both AWRP Stage 1 and 2 facilities were online.

Key finding: The Delegated Officer has referred the noise assessment report to DWER's Noise branch, who have provided the following advice:

1. The noise assessment has been conducted in a manner that fulfills all requirements outlined in the Licence conditions
2. The noise assessment appears to have been conducted in a manner that will ensure accurate results (though measured noise data is not able to be verified)
3. The Licence Holder's determination that noise emissions from the AWRP and extraneous contributions are compliant with the *Environmental Protection (Noise) Regulations 1997* for each respective residential receptor seems accurate and

reliable.

As such, the Delegated Officer considers that the Licence Holder's regulatory obligations under existing Licence conditions relating to the noise assessment have been met, and noise assessment conditions will be removed from the revised Licence under this amendment.

Should noise present as an emission of concern once the recharge bores are operating at their target recharge rates, the degree of regulatory control imposed on noise emissions maybe reviewed and additional noise verification monitoring may be requested. However, the Delegated Officer notes that the main noise generating activity at the premises is the treatment of TWW by the Beenyup WWTP and not the recharge of TWW to the aquifer through the recharge bores.

2.4.4 Review of groundwater monitoring program conditions

In undertaking a review of the Commissioning Report for the Stage 2 recharge bores submitted by the Licence Holder in support of this application, DWER has also considered the suitability of monitoring conditions for the ongoing operation of all recharge bores now that the commissioning period for the recharge bores has ended. Through this review, DWER has identified that the Licence Holder may not have fulfilled their regulatory obligations outlined under existing condition 10, which requires that:

> *'The Licence Holder must…commence implementation of a groundwater monitoring program that will allow monitoring assumptions to be validated….over the ultimate extent of the injected water. The program must include:*
>
> *a) Representative sampling of the Yarragadee, Leederville and Superficial aquifers, to the satisfaction of the Groundwater Replenishment Technical Reference Group (GWRTRG)'…*

Additionally, uncertainty remains as to whether an additional validation monitoring program is required in relation to the Stage 2 replenishment scheme.

The groundwater monitoring program required by condition 10 was additional to the standard ongoing groundwater monitoring program specified in conditions 7 and 8 of the existing Licence. The GWRTRG refers to a team which was established at the commencement of the Groundwater Replenishment Trial (GWRT) period and consists of hydrogeological experts from multiple agencies (including Water Corporation and DWER) who assess the feasibility and potential hazards of groundwater replenishment from available hydrogeological, water quality and geophysical data.

Validation of assumptions

From a review of past DWER decision documents relating to the existing Licence, the key assumptions in DWER's previous assessments which required validation through further monitoring, in addition to the standard ongoing groundwater monitoring program required under the licence, were:

- A 250 m radial boundary around each recharge bore is an appropriate area to define the Recharge Management Zone (RMZ) around Stage 1 and 2 recharge bores.
- The early indication monitoring bores located about 50-60 m from the recharge bores are sufficiently representative of groundwater quality at the RMZ boundary, or in other words, if the Recycled Water Quality Guidelines or background groundwater concentrations (whichever is greater) are met at the early indication monitoring bores, they will also be met at the RMZ boundary.
- There is a low likelihood that injection of recycled water into the Leederville and Yarragadee aquifers will cause migration of recycled water into the superficial aquifer.
- The Yarragadee aquifer will have a similar or less reactive geochemical response to

recharge of recycled water compared to the Leederville aquifer.

The Licence Holder historically presented these assumptions to support their initial Licence application for the recharge scheme to DWER. They were based on the findings of previous work, including but not limited to the GWRT undertaken at the premises, a suite of groundwater models, and intrusive investigations at the Stage 1 and 2 recharge sites.

Based on the body of evidence available at the time of DWER's previous assessments, there was uncertainty about whether the Licence Holder's assumptions would be valid:

- at the full-scale of the Stage 1 and 2 replenishment scheme;
- at the different recharge sites, given the potential for hydrogeological differences between the Stage 2 northern and southern sites and the Stage 1 Beenyup site; and
- in the Yarragadee aquifer, given that much of the available evidence was from the GWRT which only involved recharge into the Leederville aquifer.

It is DWER's understanding that the groundwater monitoring program was intended to address uncertainties and thereby validate the key assumptions that informed DWER's assessments, and the regulatory controls imposed under the existing Licence - the purpose of the additional groundwater monitoring program was not to validate modelling assumptions, but rather to validate the assumptions in DWER's assessments that were based on modelling results.

DWER requested the Licence Holder provide information about the groundwater monitoring program completed for Stage 1 and the proposed monitoring program for Stage 2 to support the current Licence amendment application. In response to this request, the Licence Holder provided information across two research papers which documented the results of the model validation, which was not sufficient to assess compliance with condition 10. Additionally, the Licence Holder proposed the same approach and monitoring program to validate the model for Stage 2 and indicated that the progress of this model validation will continue to be reported to GWRTRG.

Reporting requirements

The Licence Holder has previously provided groundwater sampling analysis determinations obtained through the monitoring program only to the GWRTRG and not to DWER regulators (Industry Regulation – IR). It should be noted that the GWRTRG does not contain IR representation, and that DWER representatives on the GWRTRG are hydrogeologists that are part of Water Resource Science (WRS) and the Swan Avon Region (SAR). As such, no one with the authority to undertake risk assessments and decision making in regard to the premises Licence has historically reviewed any information from the monitoring program that has been submitted to the GWRTRG, and sufficient information has not been provided outside of the GWRTRG to IR to confirm that regulatory obligations under the Licence have been achieved.

As a part of this amendment and DWER's review of the suitability of ongoing monitoring conditions, IR has sought advice from WRS and SAR on the role of the GWRTRG and the data that has been submitted to the GWRTRG relating to the monitoring program. In response, WRS and SAR advised IR that:

- The GWRTRG is made up of members that are not decision makers regarding Part V Licences; and
- A request for formal reporting of Stage 1 and Stage 2 results directly to IR would be reasonable, as this would ensure compliance with Licence conditions as the report will be reviewed specifically by the regulating authority. This approach will also provide clear direction to the Licence Holder.

IR were also provided with an overview of the 'Stage 1 and 2 Aquifer Risk Assessment' prepared and presented to the GWRTRG by the Licence Holder. DWER representatives of the GWRTRG advised IR that results from the analysis of the movement of reinjected water and chemical

reactions in the aquifer are workshopped to assess the risk to environmental values and the Superficial, Leederville and Yarragadee aquifers. Through these workshops, the GWRTRG has assessed most risks as low or manageable with appropriate mitigation.

Through a review of the 'Stage 1 and 2 Aquifer Risk assessment' presentation, IR have identified the following key points:

- The risk assessment for chemical mobilisation in the Yarragadee aquifer has been determined as 'high' by the GWRTRG for both Stage 1 and 2. The mitigation (tasks and actions) to address this risk states that the 'workshop discussed the construction of an additional monitoring bore >50m to confirm movement and validate modelling' and to 'Review RMZ distance with Regulators', however there has been no further discussion about whether any decisions have been made about these issues by the GWRTRG.
- The 'likelihood' field of the risk assessment states that the 'Yarragadee aquifer could potentially release Cd, Co, Cu, Ni, Zn. Acid digestion tests showed release of Co, Cu, Ni, Mn. Co present in screened intervals, which in the Leederville aquifer was more prone to mobilisation with decreasing pH'.
- The Mitigations (Tasks and Actions) field also indicates that:
    - cobalt concentrations in YMB1 (Stage 1) have already exceeded the relevant guideline and a reactive transport model predicts that the cobalt concentration at the RMZ boundary will exceed the guideline by ~2050-2070;
    - nickel is observed to mobilise in conjunction with cobalt, but remains slightly below the guideline;
    - aluminium, iron, manganese and fluoride have mobilised and cobalt has been detected in one of the Stage 2 bores;
    - there's a statement about an arsenic detection in YMB3 but the concentration is missing so this cannot be interpreted.

Key finding: In reviewing the suitability of monitoring conditions for the ongoing operation of the recharge bores, the Delegated Officer considers the following:

1. The Licence Holder has not formally submitted information to DWER to date (i.e. outside of the GWRTRG) to demonstrate that key assumptions that were relied upon in DWER's previous assessments have been validated by monitoring in the vicinity of the Stage 1 recharge bores.
2. The Licence Holder has not formally submitted information to DWER to date (i.e. outside of the GWRTRG) to outline the proposed scope of the groundwater monitoring program in the vicinity of the Stage 2 recharge bores to validate key assumptions that were relied upon in DWER's previous assessments.
3. To ensure that sufficient information is formally submitted to DWER following Stage 2 validation, conditions may be required on the revised Licence outlining submission requirements of a Stage 2 groundwater report specifically to IR so that compliance with Licence conditions may be assessed.
4. The requirement in existing condition 10 for certain aspects of the monitoring program to be completed "to the satisfaction of the GWRTRG" is not appropriate because:
    i. there is a potential conflict of interest given that Water Corporation is the licence holder and has representatives on the GWRTRG; and
    ii. it may not be enforceable if the GWRTRG were to disband in the future.

    DWER's IR branch should therefore take ownership over the submission of reports as IR officers have authority to review these reports in the context of ensuring regulatory obligations under the Licence have been achieved. IR can then seek advice from

DWER internal experts where required (i.e. from WRS and SAR).

5. The Licence Holder will need to address the high risk rating assigned to chemical mobilisation in the Yarragadee aquifer – it may be suitable to incorporate this requirement into revised conditions on the Licence to ensure IR is provided with this information.
6. Of the potential contaminants associated with mobilisation, only cadmium, copper and zinc are included in the L9034 groundwater monitoring program. Based on comments in the 'Stage 1 and 2 Aquifer Risk Assessment' it seems appropriate to incorporate at a minimum cobalt and nickel, as contaminants of potential concern, into ongoing monitoring requirements on the Licence.
7. There are currently no bores conditioned on the licence for the Superficial Aquifer, and no conditions on the licence specifying monitoring requirements for the Superficial Aquifer.

2.4.5 Correction of errors to premises throughput

In reviewing the suitability of general Licence conditions for the ongoing operation of the Stage 1 and 2 recharge bores, the Delegated Officer has examined the suitability of the current wording in relation to the production/design capacity (premises throughput) specified on the existing Licence. This is currently listed as 28 GL/year which is based on the maximum potential treated wastewater recharge rate for the Stage 1 and 2 bore network.

The Delegated Officer considers that as the throughput is currently stated, it does not clearly capture the AWRP's design capacity, which is higher that 28 GL/year. To address this, DWER sought advise from the Licence Holder through correspondence on the 1 August 2022, asking that they provide information on the design capacity of the AWRP so that this could be considered in how DWER defines the design/production capacity going forward. Advice received from the Licence Holder through the submission of this amendment application indicated that the combined (Stage 1 and 2) design capacity of the AWRP is 88.25 ML/day, or approximately 51.1 GL/year. The likely capacity of the WWTP is 140 ML/day.

As such, to correctly identify throughputs relevant to the separate operational aspects of the premises, being the treatment of sewage and the recharge of TWW, the Delegated Officer considers that separate design capacities should be listed on the Licence for Category 54 parts a) and b), which will reflect the following:

- Category 54 – Sewage Facility: Premises –
  - a) on which sewage is treated (excluding septic tanks) – assessed design capacity of 51.1 GL/year; or
  - b) from which treated sewage is discharge onto land or into waters. – assessed design capacity of 28 GL/year

It is the intent of the Delegated Officer that this will more clearly delineate aspects of premises throughput for ongoing operations and ensure operational throughput is accurately reflected on the Licence. There are no changes to the regulatory obligations under the Licence for the Licence Holder with the implementation of this amendment.

2.4.6 Other DWER initiated amendments

In reviewing the requirements of the Commissioning Report in relation to current legislative obligations implemented through existing Licence conditions, DWER has identified that some current condition wording is ambiguous and does not clearly outline the Licence Holders regulatory obligations. As a result of this, regulatory duplication may exist between current licence conditions which places unnecessary regulatory burden on the Licence Holder. Additionally, numerous minor typographical errors have also been identified throughout Licence

conditions.

DWER therefore intends to update condition wording to remove ambiguity (where identified) and correct typographical errors throughout the Licence as a part of this Licence amendment.

The obligations of the Licence Holder have not changed in amending the Licence in this manner. The department has not undertaken any additional risk assessment of the Premises related to these proposed amendments to the Licence.

In amending the Licence, the CEO has also:

- updated the format and appearance of the Licence;
- revised Licence condition's numbers, and removed any redundant conditions and realigned condition numbers for numerical consistency; and
- corrected clerical mistakes and unintentional errors.

The full consolidation of Licence conditions as they relate to the Revised Licence are detailed in Section 7.1. Previously issued amendment reports will remain on the department's website for future reference and will act as a record of the department's decision making.

3. Part IV of the EP Act

The premises is subject to Ministerial Statement MS 1065 which was granted on 12 October 2017. This Ministerial Statement relates to the Stage 2 groundwater replenishment scheme, to which the operations of the Stage 2 recharge bores apply. The Ministerial Statement is primarily associated with the construction of pipelines for the conveyance of treated wastewater and recycled water and potential impacts surrounding the recharge sites.

The ocean outfall from the Beenyup WWTP is regulated under Ministerial Statements 382 and 569. This is directly relevant to the AWRP as its wastes are also discharged to the marine environment via the Beenyup WWTP Ocean Outfall infrastructure. The Licence Holder has applied to amend both Ministerial Statements to allow for the ongoing discharge of waste from the future Stage 2 AWRP through the ocean outlets.

When complete, this amendment is expected to deliver a single updated condition set. To avoid regulatory duplication, the discharge of waste from the AWRP to the marine environment will not be assessed under Part V of the EP Act or regulated through the revised Licence.

In exercising its duties, the Department must ensure that the decisions and conditions for a Licence are not contrary to, or otherwise than in accordance with, an implementation agreement or decision of the Minister under sections 54(4)(b), 57(4)(b), and 59B(7)(b) of the EP Act. This means that any amendments made to the existing Licence will be consistent with the Ministerial Statement.

4. 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.

4.1 Source-pathways and receptors

4.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises operation which

have been considered in this Amendment Report are detailed in Table 1 below.

Table 1 also details the proposed control measures the Licence Holder has proposed to assist in controlling these emissions, where necessary.

Table 1: Licence Holder controls

Emission	Sources	Potential pathways	Proposed controls
Noise	Operation of the AWRP	Air/windborne pathway	The Licence Holder has provided the noise assessment report which demonstrates premises operations are in compliance with the Noise Regulations.
Wastewater from the AWRP treatment process	Rupture of pipes resulting in treated wastewater or chemical discharge to land	Seepage to soils and groundwater	AWRP largely constructed on concrete pad. In the event of equipment failure, the entire AWRP can be bypasses until the problem is addressed. Storage tanks contain water that has been treated to meet DoH standards. Chemicals are stored in bunded locations.
	Breach of containment tanks resulting in treated wastewater or chemical discharge to land	Seepage to soils and groundwater	
Recycled Water	Recharge of Recycled Water from the AWRP into the aquifers	Direct discharge to land and waters	Management of recharge rate based on flow and pressure control at each recharge bore. 8 groundwater monitoring bores across three recharge sites that monitor pressure (water level) and water quality. Thirteen critical control points to meet water quality discharge criteria – failure will immediately divert flows to the marine discharge point.
	Potential upward seepage of Recycled Water into the superficial aquifer	Direct discharge to land and waters	Downward pressure gradient to be maintained from the superficial to the Leederville aquifer where possible. Recharge rates managed using flow and pressure control at each recharge bore. Management of the recharge rate based on monitoring data from the four groundwater monitoring bores.

4.1.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020), the Delegated Officer has excluded employees, visitors and contractors of the Licence Holder's 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 premises	The nearest residence is approximately 200m to the west of the Premises. Others are located approximately 450m to the south-east of the Premises.
Environmental receptors	**Distance from prescribed activity**
Important wetlands – Western Australia	Joondalup Lake, approximately 1.8km to the east of the Premises. Nationally significant wetlands identified in A Directory of Important Wetlands in Australia (Environment, 2001).
Geomorphic Wetlands	Lake Joondalup, approximately 1.8km to the east of the Premises (Conservation Category). Beenyup Swamp, approximately 1km east (Conservation Category). This dataset displays the location, boundary, geomorphic classification (wetland type) and management category (Conservation, Resource Enhancement, or Multiple Use) on the Swan Coastal Plain.
Department of Biodiversity, Conservation and Attractions managed lands and waters	Woodvale Nature Reserve (R30809), approximately 300m to the east of the Premises. Marmion Marine Park is located approximately 5km west of the Premises and surrounds the ocean outfalls used to convey the waste. Yellagonga Regional Park located approximately 1.4km to the east of the Premises.
Bush Forever: Regional open space or proposed regional open space	Groundwater recharge infrastructure located within Bush Forever site 303.
Threatened Ecological Communities (TEC) and Priority Ecological Communities (PEC)	The nearest Priority 3 PEC is located approximately 2.5km south of the Premises (coastal shrub lands on shallow sands).
Threatened/Priority Fauna	Schedule 2 bird species identified within the AWRP Premises boundary. The WA Threatened and Priority Fauna Database which contains records of observations of any fauna listed as threatened under the Wildlife Conservation Act 1950 or listed on the DPaW Priority Fauna List.
Groundwater Dependant Ecosystems (GDE)	Located adjacent to the northern and southern edges

(as identified by the Bureau of Meteorology)	of the Premises. Lake Joondalup is identified as a GDE, located approximately 1.8km to the east of the Premises and groundwater recharge wells.
Underlying P3 Groundwater area (RIWI Act 1911)	Perth Coastal and Gwelup Underground Water Pollution Control Area The Leederville and Yarragadee aquifers

The AWRP facility is located on a larger part of Lot 8278 on Plan 30778 (approximately 83 hectares of Crown land vested to the Applicant), Ocean Reef Road, Craigie WA 6025 adjacent to the existing Beenyup WWTP. The general location of the AWRP is shown in Figure 1 below as defined by the red boundary. The Premises is bounded by the Mitchell Freeway to the east, Ocean Reef Road to the north, the residential suburb of Craigie to the west and bushland to the south.

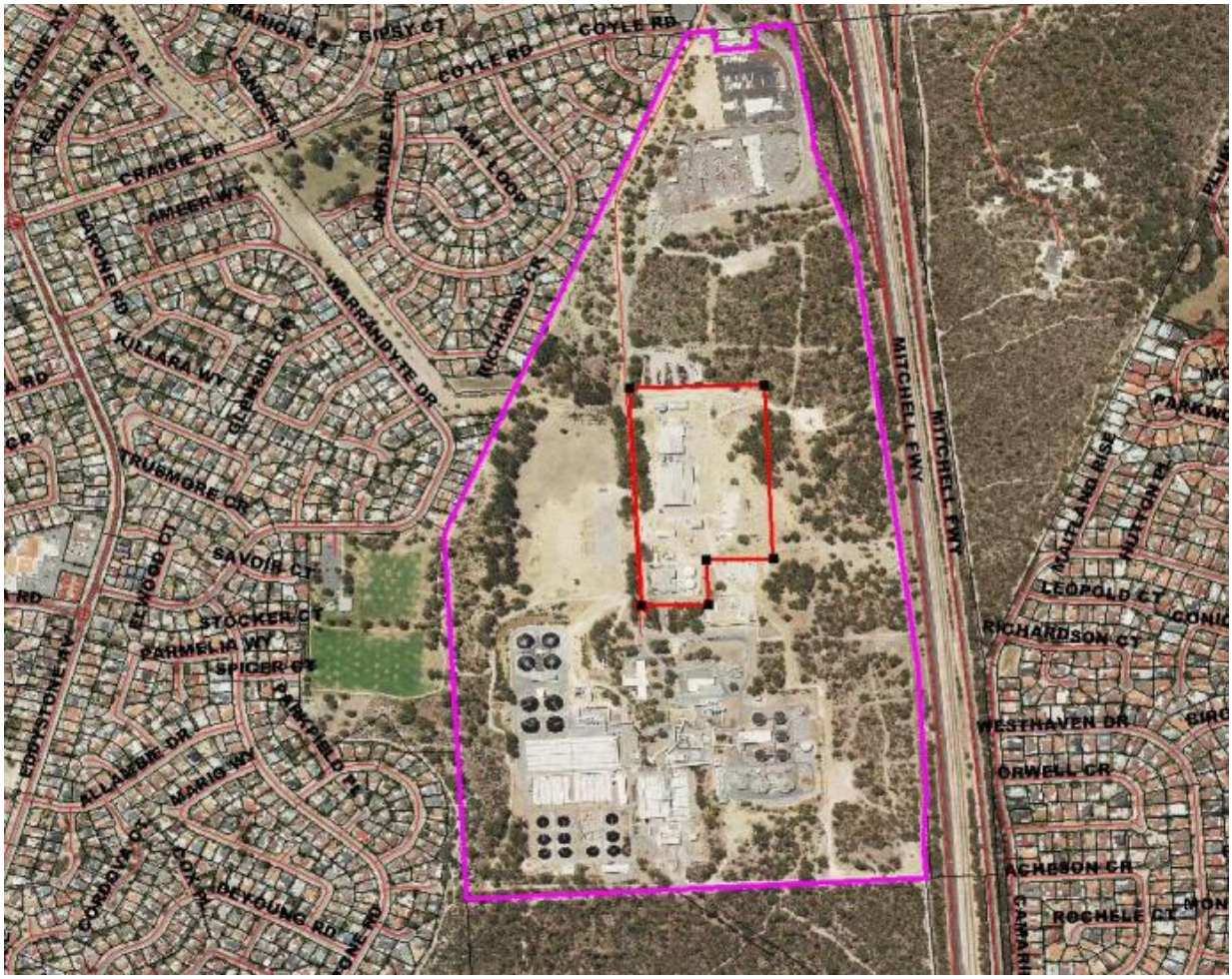

Figure 1: Location of AWRP in relation to surrounding area

4.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for those emission sources which are proposed to change and takes into account potential source-pathway and receptor linkages as identified in Section 4.1. Where linkages are incomplete they have not been considered further in the risk assessment.

Where the Licence Holder has proposed mitigation measures/controls (as detailed in Section 4.1), these have been considered when determining the final risk rating. Where the Delegated Officer considers the Licence Holder's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the Licence as regulatory controls.

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

The Revised Licence L9034/2017/1 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises i.e. operation of the Stage 2 groundwater recharge bores.

The conditions in the Revised Licence have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

Table 3. Risk assessment of potential emissions and discharges from the Premises during operation

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient ?	Conditions[2] of licence	Justification for additional regulatory controls
Source/ Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
Operation of the AWRP	Noise	Air/windborne pathway causing impacts to health and amenity	Nearest residential premises located approximately 200 m to the west of the Premises.	Refer to Section 4.1	C = Minor L = Possible **Medium Risk**	Y	N/A	The Licence Holder has provided the noise assessment report which demonstrates premises operations are in compliance with the Noise Regulations. Referral of the noise assessment report to DWER technical experts confirms the reports findings. As such, the Delegated Officer has removed noise assessment conditions from the revised Licence. Should noise present as an emission of concern once the recharge bores are operating at their target recharge rates, the degree of regulatory control imposed on noise emissions maybe reviewed and additional noise verification monitoring may be requested.
Reinjection of Recycled Water from the AWRP into the Leederville and Yarragadee aquifers	The recharge of Recycled Water from the AWRP into the aquifers may cause geochemical reactions within the aquifer matrix which have the potential to impact the beneficial use of the aquifers.	Recharge Bores and Groundwater abstracted from the Leederville and Yarragadee aquifers - contamination of the aquifer/s from geochemical reactions with matrix impacting beneficial use.	The Leederville and Yarragadee aquifers Human receptors impacted through extraction of potentially contaminated water	Refer to Section 4.1	C = Minor L = Possible **Medium Risk**	N	**Conditions 10 – 15**	Refer to Section 5
	Potential upward seepage of Recycled Water into the superficial aquifer. This has the potential to cause geochemical reactions in the superficial aquifer which have the potential to impact the beneficial use of the aquifer	Groundwater dynamics resulting in injected water breaching the Pinjar seal - impacts to the current and potential beneficial use of the superficial aquifer including impacts to groundwater dependent ecosystems.	Superficial aquifer and groundwater dependent ecosystems	Refer to Section 4.1	C = Moderate L = Rare **Medium Risk**	Y	Condition 5	N/A

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient ?	Conditions[2] of licence	Justification for additional regulatory controls
Source/ Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
Sewage or chemical pipes	Rupture of pipes resulting in treated wastewater or chemical discharge to land.	Direct discharge onto land - soil contamination inhibiting vegetation growth and survival. Contamination of superficial groundwater	Vegetation and Bush Forever Site 303 adjacent to discharge area Soils and groundwater	Refer to Section 4.1	C = Slight L = Rare **Low Risk**	Y	Conditions 2 and 17	N/A
Sewage or chemical storage tanks	Breach of containment tanks resulting in treated wastewater or chemical discharge to land.	Direct discharge onto land - soil contamination inhibiting vegetation growth and survival. Contamination of superficial groundwater	Vegetation and Bush Forever Site 303 adjacent to discharge area Soils and groundwater	Refer to Section 4.1	C = Slight L = Rare **Low Risk**	Y	Conditions 2 and 17	N/A

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

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

5. Detailed risk assessment

Given the number of uncertainties highlighted in DWER's past assessments, validation of key assumptions is considered an important milestone to inform how DWER regulates the ongoing groundwater replenishment scheme under the Part V Licence. As such, and in line with the key findings outlined in Section 2.2.4, the Delegated Officer considers that the following additional regulatory controls should be incorporated into the revised Licence

5.1 Stage 1 groundwater review report

The Delegated Officer considers that the Licence Holder has not formally submitted sufficient information to DWER (outside of the GWRTRG) to demonstrate that key assumptions that were relied upon in DWER's previous assessments have been validated by monitoring in the vicinity of the Stage 1 recharge bores. The Delegated Officer therefore finds it appropriate to include conditions in the revised Licence that require the Licence Holder to submit a Stage 1 Groundwater Review report. This report should be informed by the results of previous groundwater monitoring conducted within the vicinity of recharge bores LRB1, LRB2, LRB3 and YRB1 and assess the following:

- whether a 250 m radial boundary around each Stage 1 recharge bore represents a suitable areal extent for the Recharge Management Zone;
- whether groundwater quality at monitoring bores LMB1, LMB2, LMB3 and YMB1 is representative of groundwater quality at the boundary of the respective Recharge Management Zones or if additional monitoring bores are needed characterise groundwater quality at the boundary of these Recharge Management Zones;
- the likelihood that injection of recycled water into recharge bores LRB1, LRB2, LRB3 and YRB1 will cause migration of recycled water into the superficial aquifer and any potential adverse environmental outcomes that may result from this migration;
- whether the Yarragadee aquifer exhibits a similar reactive geochemical response to recharge of recycled water compared to the Leederville aquifer; and
- the suitability of the existing process monitoring, ambient aquifer pressure monitoring and ambient groundwater quality monitoring programs as specified on the existing Licence for the purpose of ongoing operational monitoring for the Stage 1 recharge scheme.

The inclusion of these requirements will ensure that information obtained to demonstrate the validation of key assumptions that were relied upon in DWER's previous assessments has been reviewed by a regulatory body with jurisdiction to determine whether the Licence Holder has fulfilled their regulatory obligations under previous Licence conditions.

Additionally, the inclusion within new Licence conditions to assess whether additional monitoring bores are needed characterise groundwater quality at the boundary of these Recharge Management Zones will help address uncertainties surrounding the high risk rating that the Licence Holder has assigned to the chemical mobilisation in the Yarragadee aquifer, noting that the Licence Holder stated 'the construction of an additional monitoring bore >50m to confirm movement and validate modelling' as a potential mitigation strategy in the 'Stage 1 and 2 Aquifer Risk Assessment'.

It has been identified during this assessment that there are currently no bores conditioned on the licence for the Superficial Aquifer, and no conditions on the licence specifying monitoring requirements for the Superficial Aquifer. The Delegated Officer will therefore review the Stage 1 groundwater review report to determine whether information presented is sufficient to justify whether there is likely to be migration of recycled water into the Superficial Aquifer. Should further information be required on the outcome of this review, the Delegated Officer will consider

whether there is justification to include monitoring requirements for the Superficial Aquifer on the Licence to ensure that adequate information is provided to inform decision making surrounding the ongoing regulation of the premises.

5.2 Stage 2 groundwater monitoring

The Delegated Officer considers that the Licence Holder has not formally submitted sufficient information to DWER (outside of the GWRTRG) to outline the proposed scope of the groundwater monitoring program in the vicinity of the Stage 2 recharge bores to validate key assumptions that were relied upon in DWER's previous assessments.

The Licence Holder has confirmed that monitoring to inform the Stage 2 groundwater review report will consist of the monitoring already undertaken at the premises and required through Licence conditions 3, 5 and 7. The Licence Holder considers that the monitoring outlined through these Licence conditions is sufficient to effectively define the environmental risk resulting from groundwater recharge.

The Delegated Officer therefore considers that the submission of a formal Stage 2 groundwater monitoring plan will not be required. However, there is expectation that the Stage 2 Groundwater review report should be informed by results from monitoring undertaken in accordance with existing licence conditions and should include:

- the monitoring frequency;
- the monitoring parameters; and
- the monitoring program duration.

5.3 Stage 2 groundwater review report

To ensure that sufficient information is formally submitted to DWER (outside of the GWRTRG) following Stage 2 validation, the Delegated Officer has determined that requirements for the submission of a Stage 2 Groundwater Review report should be added to the revised Licence. This report must be informed by the results of previous groundwater monitoring conducted within the vicinity of recharge bores LRB4, LRB5, YRB2 and YRB3, and assess the following:

- whether a 250 m radial boundary around each Stage 2 recharge bore represents a suitable areal extent for the Recharge Management Zone;
- whether groundwater quality at monitoring bores LMB4, LMB5, YMB2 and YMB3 is representative of groundwater quality at the boundary of the respective Recharge Management Zones or if additional monitoring bores are needed characterise groundwater quality at the boundary of these Recharge Management Zones;
- the likelihood that injection of recycled water into recharge bores LRB4, LRB5, YRB2 and YRB3 will cause migration of recycled water into the superficial aquifer and any potential adverse environmental outcomes that may result from this migration;
- whether the Yarragadee aquifer exhibits a similar reactive geochemical response to recharge of recycled water compared to the Leederville aquifer; and
- the suitability of the existing process monitoring, ambient aquifer pressure monitoring and ambient groundwater quality monitoring programs as specified on the existing Licence for the purpose of ongoing operational monitoring for the Stage 1 recharge scheme.

The inclusion of these requirements will assist regulatory authorities within DWER in determining whether any additional monitoring of the recharge bores will be required for ongoing operations.

Additionally, the inclusion within new Licence conditions to assess whether additional monitoring

bores are needed characterise groundwater quality at the boundary of these RMZs will help address uncertainties surrounding the high risk rating that the Licence Holder has assigned to the chemical mobilisation in the Yarragadee aquifer, noting that the Licence Holder stated 'the construction of an additional monitoring bore >50m to confirm movement and validate modelling' as a potential mitigation strategy in the 'Stage 1 and 2 Aquifer Risk Assessment'.

The Delegated Officer will consider results within the Stage 2 groundwater review report alongside results detailed within the Stage 1 groundwater review report in relation to the sufficiency of evidence presented to justify whether there is likely to be migration of recycled water into the Superficial Aquifer. Should results from the Stage 1 groundwater review indicate that monitoring of the Superficial Aquifer is required to adequately demonstrate whether or not migration between aquifers is occurring, then monitoring requirements may be placed within the Licence. Results from this monitoring should subsequently be included within the Stage 2 groundwater review report.

5.4 Parameters for ongoing monitoring

The Delegated Officer notes the following findings from a review of the 'Stage 1 and 2 Aquifer Risk assessment' presentation':

- cobalt concentrations in YMB1 (Stage 1) have already exceeded the relevant guideline and a reactive transport model predicts that the cobalt concentration at the RMZ boundary will exceed the guideline by ~2050-2070; and
- nickel is observed to mobilise in conjunction with cobalt but remains slightly below the guideline.

Based on these findings, and the high risk rating that the Licence Holder has assigned to the chemical mobilisation in the Yarragadee aquifer, the Delegated Officer will incorporate monitoring requirements for cobalt and nickel within groundwater quality monitoring conditions on the Licence. This will ensure that contaminants identified as having mobilised within the aquifer are tracked and that monitoring data obtained for these parameters can be used to interpret the rate of chemical mobilisation within the aquifer. This will in turn assist in determining whether a 250 m radial boundary around each recharge bore represents a suitable areal extent for the RMZ.

Action criteria for both cobalt and nickel have been obtained from the Groundwater Replenishment Recycled Water Quality Parameters, which were developed by the Department of Health from data gathered during the GWRT. These parameters have also been used for Action criteria of other contaminants monitored for in ambient groundwater on the existing Licence. However, the Licence Holder has advised that monitoring results obtained indicate that Cobalt is already exceeding it's assigned action criteria. Should the action criteria for cobalt and nickel be added to Table 5 with action criteria for other parameters, the Licence Holder will be immediately non-compliant with Licence conditions, as the Licence specifies that these action criteria cannot be exceeded.

The Delegated Officer considers that it remains important to monitor cobalt and nickel within groundwater and that the action criteria obtained from Groundwater Replenishment Recycled Water Quality Parameters are suitable. To ensure that the Licence Holder remains in compliance with their Licence, the Delegated Officer will incorporate a new condition into the Licence which requires the Licence Holder to investigate and record exceedances in the action criteria for Cobalt and Nickel within monitoring results. The Licence Holder will then be required to report on these exceedances within the Annual Environmental Report. It is also assumed by the Delegated Officer that this information will be beneficial for the Licence Holder to inform the outcomes of the Stage 1 and 2 Groundwater review reports in relation to the suitability of the current 250m extent of the RMZ.

Should the Delegated Officer be alerted that other contaminants appear to be mobilising and reaching concentrations within monitoring bores which are close to or exceeding relevant

guidelines (aluminium, iron, manganese and fluoride have already been identified as having this potential) the Delegated Officer will consider also incorporating monitoring requirements for these contaminants into conditions on the Licence.

For noting: The Delegated Officer has implemented the above amendments to act as an expansion to the regulatory obligations under existing condition 10. This is to ensure that the existing regulatory obligations under the Licence are more clearly defined for any future monitoring undertaken as a part of premises operations, and to clearly outline outstanding information requirements to the Licence Holder.

It should be noted that minimal additional regulatory obligation has been implemented as a result of these amendments, with additional controls mainly focusing on clarifying the findings from the Delegated Officers review of the Stage 1 and 2 Aquifer Risk assessment.

6. Consultation

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

Table 4: Consultation

Consultation method	Comments received	Department response
City of Joondalup advised of proposal (17 January 2023)	The City has no objection or further comment to make regarding the application.	Noted.
Department of Health (DoH) advised of proposal (17 January 2023)	The DoH advises that there are no objections to the Water Corporation's stage 2 commissioning of recharge bores located at its Beenyup advanced water recycling plant.	Noted.
Licence Holder was provided with draft amendment (6 April 2023)	Comments were provided to DWER on 3 November 2023 and are outlined in Appendix 1. In response to comments provided, DWER issued the Licence Holder with a revised draft Licence for comment on 16 January 2024. Additional comments were provided to DWER on 8 March 2024 and are outlined in Appendix 1.	As outlined in Appendix 1.

7. Conclusion

Based on the assessment in this Amendment Report, the Delegated Officer has determined that a revised Licence will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

7.1 Summary of amendments

Table 5 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the revised Licence as part of the amendment process.

Table 5: Summary of Licence amendments

Condition no.	Proposed amendments
N/A Category description	Premises throughput design capacities included for Parts a) and b) of Category 54.
1, Table 1	Recycled water management – Recharge bores • Condition wording updated to authorise development of these bores for the purpose of increasing recharge rates and remediation of the bores when required. Recycled water management – Ambient groundwater monitoring bores • Previous error with the location of the bores has been rectified Addition of 'gravity' operational requirement for pumping systems and pipework
3, 4, 5 (previous Licence)	Noise assessment conditions – removed with provision of Noise assessment
2, Table 2	Titles updated to 'Recharge monitoring'. Condition wording updated to correct terminology errors. Reference to limits removed. Table 3, Column 1 Title heading changed from 'Emission point reference' to 'Location' as not all listed items are emission points. NATA accreditation requirement added to relevant parameters. Labelling of 'Redox' changed to 'Redox potential' as more accurate description. Reference to AS/NZS 5667.11 corrected to AS/NZS 5667.10 as 5667.11 is specifically for groundwater and not relevant to monitoring recycled water.
3	Reference to discharges added to condition. New condition for limit exceedances to correct terminology errors previously found in condition 2.
5, Table 3	Title of section updated to 'Recharge management zone monitoring program'. Table 3 title updated to remove reference to 'ambient'. Condition wording updated to correct terminology errors. Reference to limits removed. Table 4, Column 1 Title heading changed from 'Emission point reference' to 'Location' as not all listed items are emission points.
5	Reference to discharges added to condition. New condition for limit exceedances to correct terminology errors previously found in condition 5
6, Table 4	Table 4 title updated to remove reference to 'ambient'. Condition wording updated to correct terminology errors. Table divided into monitoring specifications for Stage 1 bores and Stage 2 bores to better define monitoring frequencies.

	Table notes referencing monitoring frequencies removed. Reference to limits removed. Non-NATA accreditation permission added to relevant parameters in Table 4. Monitoring requirements for Cobalt and Nickel incorporated into Table 4.
7	New condition for action criteria exceedances to correct terminology errors previously found in condition 7. Reference to discharges added to condition.
8	Remove reference to limit exceedance – not relevant to condition. Wording updated for better readability. Notification timeframe extended to 40 days.
9, Table 5	New condition added requiring the investigation and recording of exceedances of action criteria for cobalt, nickel and pH.
10 (previous Licence)	Removed and replaced by new condition set
10	New condition for the Stage 1 Groundwater Review report submission
11	New condition outlining Stage 1 Groundwater Review report requirements
12	New condition for the Stage 2 Groundwater Review report submission
13	New condition outlining Stage 2 Groundwater Review report requirements
14	Annual Audit Compliance Report (AACR) submission requirement condition replacing previous condition 14 – updated to standard wording currently in use by the Department. Submission date changed to 1 October to align with preferred submission date for all DWER regulated premises operated by the Licence Holder.
11 (previous Licence)	Removed and incorporated into new conditions
15, Table 6	Annual Environmental Report (AER) submission requirement condition, incorporating submission requirements from previous condition 11 - updated to standard wording currently in use by the Department. Submission date changed to 31 March. Inclusion of requirement to provide outcome of investigations into Cobalt, Nickel and pH action criteria exceedances.
16	Process monitoring report specifications condition for inclusion with the AER, incorporating submission requirements from previous condition 11 - updated to standard wording currently in use by the Department.
17	Ambient groundwater monitoring report specifications condition for inclusion with the AER, incorporating submission requirements from previous condition 11 - updated to standard wording currently in use by the Department.
18	Retention duration of books changed from 3 years to ‘the duration of the Licence’ in line with current Departmental decision.

14 (previous Licence)	Removed and incorporated into new conditions.
16, 17, 18, 19 (previous Licence)	Removed with conclusion of commissioning activities.
N/A Schedule 1: Maps	Map of monitoring locations moved from Schedule 2 to Schedule 1
N/A Schedule 2: Primary Activities	Schedule deleted as primary activities are now detailed on the front page of the Licence, in line with current Licence formatting in use by the Department.

Table 6: Consolidation of Licence conditions in this amendment

Existing condition	Condition summary	Revised licence condition	Conversion notes
N/A	Licence history	N/A	Included in line with current Licensing format.
N/A	Explanatory notes	N/A	Removed in line with current Licensing format.
N/A Table 1	Definitions	N/A Table 7	Definitions section moved to the end of Licence conditions, in line with current Licensing format. Definitions updated / amended as required.
N/A	Interpretation	N/A	Revised to current Licensing format.
Condition 1 Table 2	Authorised emissions and discharges	N/A	Redundant condition removed from Licence.
Condition 2 Table 3	Infrastructure and equipment	Condition 1 Table 1	New table numbering. Amendments to recycled water management operation requirements incorporated into Table 1.
Conditions 3, 4 and 5	Noise assessment	N/A	Conditions removed with Licence – assessment required under conditions has been provided.
Condition 6 Table 4	Process monitoring	Condition 2 Table 2	Condition wording revised and updated.
N/A	Limit exceedance for Table 3	Condition 3	New condition outlining limit exceedance requirements for Table 2.
Condition 7 Table 5	Ambient aquifer pressure monitoring	Condition 4 Table 3	Condition wording revised and updated.

Existing condition	Condition summary	Revised licence condition	Conversion notes
N/A	Limit exceedance for Table 4	Condition 5	New condition outlining limit exceedance requirements for Table 3.
Condition 8 Table 6	Ambient groundwater quality monitoring	Condition 6 Table 4	Condition wording revised and updated.
N/A	Action criteria exceedance for Table 5	Condition 7	New condition outlining limit exceedance requirements for Table 4.
Condition 9	Action criteria exceedance investigation requirements	Condition 8	Updated to current format. Reference to limits removed as redundant to condition.
N/A	Action criteria exceedance investigation requirements (cobalt and nickel)	Condition 9 Table 5	New condition and Table incorporated into Licence.
Condition 10	Groundwater monitoring program validation	Conditions 10 – 13	Condition removed, requirements incorporated into other conditions.
N/A	Stage 1 Groundwater Review report submission	Condition 10	New condition outlining Stage 1 Groundwater Review report submission.
N/A	Stage 1 Groundwater Review report requirements	Condition 11	New condition outlining Stage 1 Groundwater monitoring review report requirements.
N/A	Stage 1 Groundwater Review report submission	Condition 13	New condition outlining Stage 2 Groundwater Review report submission.
N/A	Stage 2 Groundwater Review report requirements	Condition 14	New condition outlining Stage 2 Groundwater monitoring review report requirements.
Condition 11	Compliance report on monitoring	N/A	Condition removed, requirements incorporated into other conditions.
N/A	Annual Environmental Report	Condition 15 Table 6	Inclusion of Annual Environmental Report submission condition, incorporating reporting requirements from previous condition 11.
N/A	Process monitoring report	Condition 16	Inclusion of process / recharge monitoring report requirements in line with current standard condition wording in use by the Department. New condition incorporates reporting requirements from previous condition 11.
N/A	Ambient groundwater monitoring report	Condition 17	Inclusion of groundwater / recharge management zone monitoring report requirements in line with current standard condition wording in use by the Department. New condition

Existing condition	Condition summary	Revised licence condition	Conversion notes
			incorporates reporting requirements from previous condition 11.
Condition 12	Maintaining books	Condition 18	Updated to current format. Book retention timeframe changed in line with current Departmental decisions.
Condition 13	Complaints record	Condition 19	Updated to current format.
Condition 14	AACR submission	Condition 14	Condition wording revised and updated in line with current standard wording in use by the Department.
Condition 15	Department Request	Condition 20	Updated to current format.
Conditions 16, 17, 18 and 19 Table 7	Commissioning	N/A	Conditions removed from Licence – commissioning requirements have been met.
N/A Schedule 1	Maps	N/A Schedule 1: Maps	Map of monitoring locations incorporated into Schedule 1.
N/A Schedule 2	Primary Activities	N/A	Schedule 2 removed and Primary Activities incorporated into front page of Licence, in line with current Licensing format.

References

1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
3. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.

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

Condition	Summary of Licence Holder's comment	Department's response
Comments provided on 3 November 2023 in response to the first draft of the revised Licence.		
Condition 1, Table 1	Clarify 'Subject to compliance with Conditions 3 to 15 of this licence'. Please clarify the conditions in the table refer to this licence, distinguishing from the Ministerial Conditions in Ministerial Statements 382 and 569.	The entire content of Condition 1 can be regulated under the general provisions of the EP Act. The inclusion of Condition 1 in Licence's issued by DWER is a legacy issue from when this condition was a standard condition incorporated into all Licences. Condition 1 will be deleted from the Licence to maintain consistency with the current condition set in use by DWER
Condition 1, Table 1 (previous condition 2, table 2)	Please delete process operational requirements for the 'Pre-treatment and Mechanical screening system' which are not related to environmental outcomes to be consistent with DWER Condition Setting Policy (DWER 2015). Water corporation is responsible for the operation and maintenance of membranes to achieve the specified output required by Conditions 3 and 5. Requirements to be deleted include: 'A drinking-water disinfectant must be used to protect the ultrafiltration and reverse osmosis membranes from biofouling.' 'A drinking water approved antiscalent must be dosed to the RO feed water to inhibit scaling.'	DWER's *Guidance Statement – Setting Conditions* (2015) outlines that licences may be granted subject to conditions that are outcome-based where practical and appropriate. The Delegated Officer considers that the condition requirements requested for deletion relate to specific actions to maintain the Pre-treatment and Mechanical screening system. There is no need for this condition to be outcomes based when the Licence Holder has outlined how this infrastructure will be maintained. These condition requirements are also valid, enforceable, risk-based and site specific, which is consistent with the *Guidance Statement – Setting Conditions* (2015). These requirements will therefore be retained on the Licence. If the Licence Holder has changed their methodology for the maintenance of the Pre-treatment and Mechanical screening system, they will need to seek an amendment to the Licence to authorise this change in Licence conditions.
Condition 2, Table 2 (previous condition 3, table 3)	Please amend title to better reflect the monitoring scope of Condition 3. The current title of 'Process' is misleading eluding to the treatment process monitoring. Request change from 'Process monitoring' to 'Recharge monitoring'.	Title amended as requested.
Condition 3	Consistent with the GWR Regulatory Framework (Groundwater Replenishment Trial	Reference to discharges included as requested to align with the

Condition	Summary of Licence Holder's comment	Department's response
(previous condition 4)	Interagency Working Group and Water Corporation Dec 2012, pp 5), drinking quality water discharged via recharge bores is not considered to be an emission but may constitute as a discharge under the EP Act. Amend wording to include both emissions and discharges.	GWR Regulatory Framework.
Condition 4, Table 3 (previous condition 5, table 4)	Please amend titles to better reflect the monitoring scope of Condition 5. The current title of 'Ambient groundwater' is misleading eluding to the natural background monitoring, whereas the monitoring is within the Recharge Management Zone. Request change from 'Ambient groundwater monitoring program' to 'Recharge management zone monitoring program'.	Title amended as requested. Table 4 title to be amended to remove reference to 'ambient' to also better reflect the intent of the monitoring.
Condition 5 (previous condition 6)	Consistent with the GWR Regulatory Framework (Groundwater Replenishment Trial Interagency Working Group and Water Corporation Dec 2012, pp 5), drinking quality water discharged via recharge bores. not considered to be an emission but may constitute as a discharge under the EP Act. Amend wording to change emission to discharge.	Reference to 'emissions' have been amended to 'discharges' as requested to align with the GWR Regulatory Framework.
Condition 6, Table 4 (previous condition 7, table 5)	Please amend titles to better reflect the monitoring scope of Condition 7. The current title of 'Ambient groundwater' is misleading eluding to the natural background monitoring, whereas the monitoring is within the Recharge Management Zone. Request change from 'Ambient groundwater' to 'Recharge management zone'.	Whilst the monitoring is undertaken within the Recharge Management Zone, the monitoring is being undertaken on groundwater. As such, the titles will be amended to remove the word 'ambient' to better reflect the monitoring scope of the condition as requested.
	The proposed Ambient groundwater quality monitoring frequencies are defined by: • Monthly - Monitoring frequency for the first 12 months of recharge • Quarterly - Monitoring frequency for the second 12 months period of recharge • Biannual - Monitoring frequency after 24 months of recharge The current frequencies conditioned are unclear and not easily auditable. The requirement is implemented under Memorandum of Understanding between the Department of Health and Water Corporation for Wastewater Services and Groundwater Replenishment (MoU2021v1) Binding Protocol 1 (S499 Groundwater Replenishment Monitoring, Appendix D). Water Corporation recommends the monitoring frequencies are defined by defining the term 'recharge' used in Table 5 notes 1, 2 and 3. Further, include an additional Table 5a defining the date of bore development is required to ensure the condition is	The Delegated Officer agrees that the current frequencies conditioned are not easily interpreted or audited. However, since the proposed Table 5a is not a condition, this cannot be added to the Licence. The Delegated Officer has instead split the existing monitoring table into requirements for the Stage 1 monitoring bores (being bores LMB1, LMB2, LMB3 and YMB1) and the Stage 2 monitoring bores (being bores LMB4, LMB5, YMB2 and YMB3). Based on the date of recharge commencement for each bore (as outlined in proposed Table 5a) and monitoring frequency specifications on the Licence: • The Stage 1 monitoring bores are now subject to biannual monitoring; and • The Stage 2 monitoring bores are subject to quarterly monitoring under December 2024 and biannual monitoring

<table>
<tr><th>Condition</th><th>Summary of Licence Holder’s comment</th><th>Department’s response</th></tr>
<tr><td></td><td>auditable.

Proposed Table 5a would read as follows:
<table><tr><td>Bore</td><td>Date of recharge commencement</td></tr><tr><td>LRB1</td><td>December 2017</td></tr><tr><td>LRB2</td><td>December 2017</td></tr><tr><td>LRB3</td><td>December 2017</td></tr><tr><td>LRB4</td><td>December 2022</td></tr><tr><td>LRB5</td><td>December 2022</td></tr><tr><td>YRB1</td><td>December 2017</td></tr><tr><td>YRB2</td><td>December 2022</td></tr><tr><td>YRB3</td><td>December 2022</td></tr></table></td><td>thereafter.

As such, to remove confusion, these monitoring frequencies have been specified for Stage 1 and 2 groundwater monitoring bores through the division in Table 5.

Notes outlining frequencies have been removed from Table 5 and the notes accompanying Table 5.</td></tr>
<tr><td>N/A – Definitions, Table 7</td><td>Include the Definition for ‘Recharge’ as referred to in the notes for Table 5 in Table 7- ‘Recharge commencement: The date development completed and groundwater recharge commenced’.</td><td>This amendment is not required due to the changes to Table 5 as specified above.</td></tr>
<tr><td>Condition 7 (previous condition 8)</td><td>Amend condition as requested:

‘The Licence Holder must manage discharges to recharge bores to ensure that ambient groundwater quality predicted at the boundary of the Recharge Management Zone meets the groundwater quality Action Criteria prescribed in Table 5 ~~for the corresponding parameter do not exceed the corresponding Action Criteria when monitored in accordance with condition 7~~’.

Consistent with the GWR Regulatory Framework (Groundwater Replenishment Trial Interagency Working Group and Water Corporation Dec 2012, pp 5), drinking quality water discharged via recharge bores is not considered to be an emission but may constitute as a discharge under the EP Act. Amend wording to change emission to discharge.</td><td>Reference to ‘emissions’ have been amended to ‘discharges’ as requested to align with the GWR Regulatory Framework.

The terminology requested by the Licence holder does not change the regulatory intent of the condition – if the concentrations of a parameter do not ‘meet’ the action criteria for that parameter (i.e., they exceed it) then the Licence Holder will still be in non-compliance with Licence conditions.

The Licence Holder has verbally advised that they are exceeding the action criteria for Cobalt and Nickel within all monitoring bores. The inclusion of the action criteria for Cobalt and Nickel within Table 5 would immediately place the Licence Holder in non-</td></tr>
</table>

Condition	Summary of Licence Holder's comment	Department's response
	Proposed Condition 8 required the Water Corporation 'must….ensure …ambient groundwater …at ….sampling point .. do not exceed … table 5… Action Criteria…..'. is not appropriate for the scheme as Action Criteria are exceeded at monitoring bores located in close proximity to the recharge bores currently placing the licence in non-compliance. Agreed ambient water quality standards to be met at the boundary of the Recharge Management Zone 250 m from the recharge site are set out in: i. Memorandum of Understanding between the Department of Health and Water Corporation for Wastewater Services and Groundwater Replenishment (MoU2021v1) (DOH and Water Corporation June 2021), Binding Protocol 6 ii. Groundwater Replenishment Trial Interagency Working Group (DoH, DEC, DOW & Water Corporation) Groundwater Replenishment Regulatory Framework. The proposed condition is misaligned with the cross agency executive agreements. Water Corporation requests condition 8 is amended reflect and support the existing governance arrangements agreed and established by cross Government Executive within MoU2021v1 (DOH and Water Corporation June 2021) and: • Establish the requirement for predicted Ambient Acton Criteria to be met at Recharge Management Zone 250 m from the recharge site in accordance with Binding Protocol 6 Include a definition in Table 7 aligned to Memorandum of Understanding between the Department of Health and Water Corporation for Wastewater Services and Groundwater Replenishment (MoU2021v1) (DOH and Water Corporation June 2021), Binding Protocol 6 setting out then agreed ambient water quality standards to be met at the boundary of the Recharge Management Zone 250 m from the recharge site.	compliance with Licence conditions. However, as Cobalt and Nickel have been identified as having potential to mobilise through the aquifer, the Delegated Officer considers that the ongoing monitoring of Cobalt and Nickel is required to inform ongoing regulatory decisions at the premises and in verifying assumptions made to inform the original assessment of groundwater recharge. As such, the Delegated Officer will remove the action criteria for Cobalt and Nickel from Table, which will ensure the Licence Holder is not in non-compliance with Condition 7. The Delegated Officer will incorporate a new condition (10) into the Licence requiring the Licence Holder to investigate the cause of exceedances of the action criteria for both Cobalt and Nickel (as outlined in new Table 6) when exceedances are found in undertaking the monitoring outlined in Condition 7. The addition of this condition will ensure that monitoring of Cobalt and Nickel continues, investigations into exceedances in the action criteria continue, but the Licence Holder is not non-compliant as a result of the exceedances. The Delegated Officer will also include reporting requirements for these investigations within the Annual Reporting Requirements outlined in Condition 16 of the Licence. It is also assumed that the results of these investigations will be used to inform the findings of the Stage 1 and 2 groundwater review reports to be prepared by the Licence Holder in accordance with Conditions 11 and 13. The decision report text has also been updated to reflect this change.
N/A – Definitions, Table 7	Include a definition for Recharge Management Zone in Table 7 – 'Recharge Management Zone: The minimum radial distance of 250m from a recharge bore for all confined aquifers at the Beenyup Groundwater Replenishment Scheme'.	The Licence Holder has requested the definition of 'recharge management zone' that was proposed under this amended be amended to text different to what is specified here. The definition proposed below has been justified as aligning with the definition outlined in the Memorandum of Understanding between the Department of Health and Water Corporation for Wastewater Services and Groundwater Replenishment (MoU2021v1) (DOH

Condition	Summary of Licence Holder's comment	Department's response
		and Water Corporation June 2021) Binding Protocol 6, as well as the GWR Regulatory Framework (Groundwater Replenishment Trial Interagency Working Group and Water Corporation Dec 2012). As such, this definition has been amended to align with the Licence Holder's preferred wording as outlined in the MoU.
Condition 8 (previous condition 9)	Amend condition as requested: 'The Licence Holder must ensure that if monitoring undertaken in accordance with Condition 7, Table 5 indicates an exceedance of the Action Criteria in any ambient groundwater monitoring bore ~~for three consecutive monitoring events~~: a) ~~An~~ is investigated ~~is carried out~~ to determine the cause of the exceedance with an assessment of risks **to the environment**, and b) The CEO is notified ~~in writing within 10 working days of becoming aware of the third consecutive exceedance~~ **within 40 days** and any actions taken to correct the exceedance specified.' Please amend this condition to be consistent with the existing governance arrangements established by: • Memorandum of Understanding between the Department of Health and Water Corporation for Wastewater Services and Groundwater Replenishment (MoU2021v1) (DOH and Water Corporation June 2021) including the: o Recycled Water Quality Management Plan – UPDATED. Beenyup Groundwater Replenishment Scheme January 2022, Water Corporation o GWR Reporting Plan (Nexus ID 58585566), Water Corporation • Groundwater Replenishment Trial Interagency Working Group (DoH, DEC, DOW & Water Corporation), 2012. Groundwater Replenishment Regulatory Framework. The above documents require monthly reporting to the DOH and DWER. The proposed amendments ensure monthly advice is for any exceedance of Table 5.	The Delegated Officer has amended the condition reporting requirements as requested to align with reporting requirements in place under the Memorandum of Understanding between the Department of Health and Water Corporation for Wastewater Services and Groundwater Replenishment (MoU2021v1) (DOH and Water Corporation June 2021) and associated documents. The Delegated Officer has also amended condition wording to ensure readability of the condition and how it relates to monitoring requirements. This does not change the regulatory intent of the condition.
Condition 10	Please amend titles above Condition 10 to better reflect the monitoring scope of Condition 7. The current title of 'Ambient groundwater' is misleading eluding to the natural background monitoring, whereas the monitoring is within the Recharge	The monitoring validation required by this section of the Licence does not relate only to the recharge management zone and also requires information to be submitted relating to the migration of

Condition	Summary of Licence Holder's comment	Department's response
	Management Zone. Request change from 'Stage 1 and 2 groundwater monitoring validation' to 'Recharge management zone monitoring validation'.	recycled water between aquifers, aquifer geochemistry and the ongoing suitability of monitoring programs. All of this information, as well as the information requested relevant to the recharge management zone, relates to groundwater monitoring across recharge Stages 1 and 2. The existing title of 'Stage 1 and 2 groundwater monitoring validation' will be retained in the Licence.
	Water Corporation is in the process of having modelling outcomes finalised with CSIRO. The finalisation process with CSIRO is reported monthly at the Wastewater Services Health Advisory Committee meeting and has demonstrated to be a lengthy process. The outcome of the modelling will then inform mitigation measures and the requirements of Condition 11. Water Corporation request the completion timeframe is extended by 12 months to 30 September 2024.	The Delegated Officer will amend the completion date as requested to 20 September 2024.
Condition 11	Add the wording 'and potential adverse environmental outcomes' to the end of Condition 11c. Environmental conditions must be focused on environmental outcomes and migration should be considered in the context of adverse environmental outcomes.	The Delegated Officer has amended this condition requirement with the additional wording 'and any potential adverse environmental outcomes that may result from this migration'. It should be noted that whilst the Licence Holder can submit their assessment of potential adverse environmental outcomes resulting from the migration of recycled water into the superficial aquifer, DWER will undertake their own assessment to determine risks to the environment resulting from this activity under DWER's risk assessment framework. Results of DWER's assessment will ultimately inform ongoing regulatory actions at the premises.
Condition 12 and 13	Please delete Condition 12 and 13 requiring and prescribing a Stage 2 Groundwater Management Plan. Water Corporation proposes the licence has defined the Monitoring Plan as part of Condition 3 (Recharge Monitoring), Condition 4 Recharge Pressure Monitoring and Condition 7 Recharge Management Zone Monitoring. Water Corporation does not propose or plan to do any further monitoring as part of the Part V licence and in addition to Condition 10, 11, 14, and 15 suggest the environmental risk is being monitoring and assessed to effectively define the environmental risk.	The Delegated Officer agrees that if the Licence Holder is not proposing any additional monitoring to that specified across the Licence conditions already, then monitoring requirements to inform the Stage 2 groundwater review report are already reflected across Licence conditions. Conditions 12 and 13 outlining the provision of a Stage 2 groundwater monitoring plan have been deleted as requested. The decision report text has also been updated to reflect this change.
Condition 14 (previous	Add the wording 'and potential adverse environmental outcomes' to the end of Condition 15c.	The Delegated Officer has amended this condition requirement with the additional wording 'and any potential adverse

Condition	Summary of Licence Holder's comment	Department's response
condition 15)	Environmental conditions must be focused on environmental outcomes and migration should be considered in the context of adverse environmental outcomes.	environmental outcomes that may result from this migration'. It should be noted that whilst the Licence Holder can submit their assessment of potential adverse environmental outcomes resulting from the migration of recycled water into the superficial aquifer, DWER will undertake their own assessment to determine risks to the environment resulting from this activity under DWER's risk assessment framework. Results of DWER's assessment will ultimately inform ongoing regulatory actions at the premises.
Condition 16, Table 7 (previous condition 15, table 6)	Within Table 6, please add Condition 2 to correspond with the requirement 'Summary of any failure or malfunction of any pollution control equipment listed in Table 2, and any environmental incidents……..' This clarification is required for auditing purposes.	The requirement is included as standard condition wording and applies to general pollution control equipment and environmental incidents, not just those associated with the infrastructure and equipment listed in Condition 2. The specification of 'Condition 2' will not be included.
	The fourth line in Table 6 is only relevant to Condition 5 and 7 for amendment pressure monitoring and groundwater quality monitoring. Please remove reference to other conditions. Condition 19's groundwater monitoring report is to cover these conditions only.	Conditions included in error removed as requested.
	The Delegated Officer has included annual reporting requirements for the outcome of investigations into Cobalt and Nickel action criteria exceedances, as discussed above in regards to amendments to Condition 8 and the inclusion of new Condition 10. The Delegated Officer has also amended reference to 'processing monitoring' to 'recharge monitoring' and reference to 'groundwater monitoring' to 'recharge management zone monitoring' reflect the title changes requested for conditions 3 and 5.	
Condition 17 (previous condition 18)	Please delete to requirement to include 'a clear statement of the scope of work carried out'. A clear statement of the scope of work is carried out as the scope of work is clear from the contents and context of the licence Conditions.	This requirement is included as standard condition wording to ensure that how monitoring was undertaken is outlined in the report required. This assists DWER in determining compliance with the Licence and ensures appropriate field sampling measures have been demonstrated. As such the Delegated Officer will retain this requirement on the Licence.
	Please delete (f)(iii) as there are no time series data points to plots associated with ML/d, monthly or annual measurements associated with Table 3.	Agreed – requirement deleted as requested.
	The Delegated Officer has also amended reference to 'processing monitoring' to 'recharge monitoring' to reflect the title changes requested for condition 3.	

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	Additionally, on receipt of comment on the revised Licence from internal groundwater technical experts, the requirement for the provision of raw aquifer pressure data has been added into this condition to assist with the interpretation of groundwater monitoring results.	
Condition 18 (previous condition 19)	Please delete to requirement to include 'a clear statement of the scope of work carried out'. A clear statement of the scope of work is carried out as the scope of work is clear from the contents and context of the licence Conditions.	This requirement is included as standard condition wording to ensure that how monitoring was undertaken is outlined in the report required. This assists DWER in determining compliance with the Licence and ensures appropriate field sampling measures have been demonstrated. As such the Delegated Officer will retain this requirement on the Licence.
	Please delete (g)(iii) as there are no time series data points to plots associated with ML/d, monthly or annual measurements associated with Table 5.	Agreed – requirement deleted as requested.
	The Delegated Officer has also amended reference to 'groundwater monitoring' to 'recharge management zone monitoring' to reflect the title changes requested for condition 5.	
N/A – Definitions, Table 7	Amended wording of new definition as requested: Recharge Management Zone: means the ~~minimum distance~~ **radial distance of 250m** between recharge of recycled water and **closest** abstraction of groundwater for public drinking water supplies. Please amend wording to be consistent with the Memorandum of Understanding between the Department of Health and Water Corporation for Wastewater Services and Groundwater Replenishment (MoU2021v1) (DOH and Water Corporation June 2021) Binding Protocol 6, as well as the GWR Regulatory Framework (Groundwater Replenishment Trial Interagency Working Group and Water Corporation Dec 2012).	This definition has been amended to align with the Licence Holder's preferred wording as outlined in the MoU.
N/A – Decision report Section 2.4.1	Following 2023 redevelopment, YRB3 will be used as a gravity injection bore. During the operational period of the Works Approval YRB3 was changed to gravity flow to manage the risk of exceeding bore pressure allowable limits. Please amend reference from 'pumped flow' to 'gravity flow'.	Updated as requested as this change does not impact the final risk rating associated with this activity.
Comments provided on 8 March 2024 in response to the second draft of the revised Licence.		
N/A Licence	This amendment description missing from Licence history table on Page 2.	Amendment description has been included – overall description of major amendments.

Condition	Summary of Licence Holder's comment	Department's response
History		
Condition 1 Table 1	3 of the 4 recharge Stage 2 bores are fed by gravity (not pumps) due to issues when using pumps at those bores. Text should be changed to 'High-pressure pump or gravity and conveyance system feeding each recharge bore'	Operational requirements for 'pumping systems and pipework' updated to include gravity to reflect where bores are gravity fed.
Condition 2 Table 2	For locations 1, 2 and 3 (volume flowrate) – these parameters are flow rates (ML/d or GL/d) not volumes (ML or GL).	This is already specified in Condition 2 and across the Licence – no changes required.
	Clarifying flow between onsite and offsite bores – 28 GL/year (maximum of 14 GL/year recharged at offsite bores)	Clarification noted.
Condition 6 Table 4	Please remove superscripts consistent with the removal of the table notes.	Removed as requested.
	pH is also one of the parameters along with Cobalt and Nickel that is already in exceedance of the limit for the same reason. Please Move pH into same table (Condition 9) or we will be triggering Condition 8 as soon as the licence is issued.	pH action criteria have been removed from Table 4 as requested.
Condition 9	pH is also one of the parameters along with Cobalt and Nickel that is already in exceedance of the limit for the same reason. Please Move pH into same table (Condition 9) or we will be triggering Condition 8 as soon as the licence is issued.	pH has been incorporated into Table 5 (condition 9) as requested with an action criteria of 8.5 specified, which is consistent with the previous action criteria specified in Table 4. The Licence Holder will be required to conducted investigations into the cause of any exceedances in this action criteria, as is already specified within this condition for cobalt and nickel.
Condition 15 Table 6	First requirement in Table 6 should be referenced as condition 2.	This requirement is a standard condition wording with the intent to apply to all relevant conditions within the Licence – wording will remain unchanged.
	Incorrect condition reference for 'outcome of investigations into cobalt and nickel action criteria exceedances' – reference should be changed from 10 to 9.	Corrected.
	Amend annual environmental reporting submission date to March 2025 to allow for sufficient review by the Technical Working group.	Changed as requested.
	pH is also one of the parameters along with Cobalt and Nickel that is already in exceedance of the limit for the same reason. Please Move pH into same table (Condition 9) or we will be triggering Condition 8 as soon as the licence is issued.	Requirement to provide an outcome of investigations into pH action criteria exceedances also added into annual reporting requirements in light of amendments to conditions 9.

Condition	Summary of Licence Holder's comment	Department's response
N/A- Decision report 2.4.1	Report on remediation and lessons learnt has been completed. Report can be provided if requested.	The Decision Report text has been updated to reflect that the report on remediation and lessons learnt has now been completed. However, since the provision of original monitoring data appears to satisfy the requirements of Condition 19, this report is not required by DWER to inform this amendment. Should DWER require additional information on the recharge bores to inform future assessments, this report may be requested.
	Delete text "was achieved".	Text deleted as an error.
	Delete sentence - "It was also projected that the full 14GL recharge across the stage 2 bores would not be required until approximately 2028".	Deleted as requested – this text has no standing on final risk assessment outcomes.
N/A- Decision report 2.4.4	Water Corporation has commenced a groundwater monitoring programme of the Leederville and Yarragadee aquifers to allow the numerical model to be validated by the CSIRO. Initial data was provided to Dion Hill 30/08/2022. This monitoring is ongoing until enough data is collected to carry out model validation.	Noted – no changes to text necessary.
N/A- Decision report 2.4.5	140ML/d is likely the capacity of the WWTP. The combined Design Capacity of both AWRPs is 88.25ML/d – confirmed by Design Manager.	Text amended as requested.
	Correct text error – 5.1 GL/y should be 51.1 GL/year	Corrected.
N/A- Decision report 4.1.1	There are 8 monitoring bores across the three recharge sites. These monitor pressure (water level) and water quality. Management of recharge rates are based on flow and pressure control at each recharge bore	Wording in Table 11 has been updated to better reflect applicant controls in relation to the management of recycled water.
	Upward leakage is a risk that has been assessed through the GWR-TRG and DWER. Maintaining a downward pressure gradient between the superficial and confined aquifers is not practical and would not allow recharge to occur. Management of recharge rates are based on flow and pressure control at each recharge bore.	DWER is aware that a downward pressure gradient between the superficial and confined aquifers is not maintained in some areas during groundwater replenishment. The Delegated Officer has amended wording in Section 4.1.1 to reflect that a downward pressure gradient will be maintained where possible, and that recharge rates are managed using floe and pressure control at each recharge bore. Whether and to what extent the vertical gradient reverses in the vicinity of the Stage 2 recharge sites needs further investigating

Condition	Summary of Licence Holder's comment	Department's response
		and will likely be part of the risk assessment should any changes be proposed to the Stage 2 scheme in the future.
N/A- Decision report 4.1.2	Lake Joondalup is situated east of AWRP, not west.	Corrected.
N/A- Decision report 5.3	There is not a superficial monitoring bores at the northern recharge site. At this time Water Corporation do not intend to install a superficial monitoring bore. Water Corporation have recently completed an assessment for DWER (Water Allocation Planning Branch) assessing the risk of GWR impacting Lake Joondalup. This concluded that there is no evidence that injection to the confined aquifers influences the superficial aquifer or Lake Joondalup	Noted. The Delegated Officer notes that since there is not a superficial monitoring bores at the northern recharge site, there is no way to monitor the potential risks and impacts of hydraulic head changes in the superficial aquifer from the full-scale stage 2 recharge scheme. As such, DWER may implement the construction and monitoring of a superficial bore at the northern recharge site through a subsequent amendment to the licence at a later stage. DWER will assess the need for this bore after the stage 1 groundwater review report has been submitted and reviewed by DWER officers.

Appendix 2: Application validation summary

SECTION 1: APPLICATION SUMMARY (as updated from validation checklist)					
Application type					
Amendment to licence	☒	Current licence number:	L9034/2017/1		
		Relevant works approval number:	W6070/2017/1	N/A	☐
Date application received		28 September 2022			
Applicant and Premises details					
Applicant name/s (full legal name/s)		Water Corporation			
Premises name		Advanced Water Recycling Plant			
Premises location		Part of Lot 8278 on Plan 30778 Ocean Reef Road, Craigie			
Local Government Authority		City of Joondalup			
Application documents					
HPCM file reference number:		DER2017/000181-1~6			
Key application documents (additional to application form):		• Final Environmental Commissioning Report Stage 2 Recharge Bores – September 2022 • Application to amend Licence – Additional information requested in Schedule 2 of letter • Water research - Fluoride release from carbonate-rich fluorapatite during managed aquifer recharge: Model-based development of mitigation strategies (journal article – WC involvement) • Water Resources Research - Assessing and Managing Large-Scale Geochemical Impacts From Groundwater Replenishment With Highly Treated Reclaimed Wastewater (journal article – WC involvement)			
Scope of application/assessment					
Summary of proposed activities or changes to existing operations.		Amendment is sought to: • close out the commissioning conditions to allow operation of the stage 2 recharge bores (Conditions 16, 17, 18, and 19); • extend the submission date for the noise assessment from 30 June 2022 to the end of November • authorise ongoing remediation of the bores for the bores to achieve the required discharge rates, if this activity is not considered routine maintenance by DWER			

Category number/s (activities that cause the premises to become prescribed premises)

Table 1: **Prescribed premises categories**

Prescribed premises category and description	**Assessed production or design capacity**	**Proposed changes to the production or design capacity (amendments only)**
Category 54: Sewage facility	28 GL/year	No change proposed

Legislative context and other approvals		
Has the applicant referred, or do they intend to refer, their proposal to the EPA under Part IV of the EP Act as a significant proposal?	Yes ☐ No ☒	Referral decision No: Managed under Part V ☒ Assessed under Part IV ☐
Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes ☒ No ☐	Ministerial statement No: MS1065
Has the proposal been referred and/or assessed under the EPBC Act?	Yes ☐ No ☒	Reference No:
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes ☐ No ☒	From premises decision report: Approximately 83 hectares of Crown land vested to the Applicant
Has the applicant obtained all relevant planning approvals?	Yes ☐ No ☒ N/A ☐	From premises decision report: Under Section 137 of the *Water Services Act 2012*, the Water Corporation is exempt from the requirement to obtain development approvals for public water works under a Local Planning Scheme
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes ☐ No ☒	CPS No: N/A No clearing is proposed.
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes ☐ No ☒	Application reference No: N/A Licence/permit No: N/A No clearing is proposed.
Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes ☐ No ☐	Licence/permit No: CAW183044(1) and CAW183059(1)
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes ☐ No ☒	Name: N/A Type: N/A Has Regulatory Services (Water) been consulted? Yes ☐ No ☐ N/A ☒ Regional office: N/A

Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes ☒ No ☐	Name: Perth Coastal and Gwelup Underground water pollution control area Priority: P3 Are the proposed activities/ landuse compatible with the PDWSA (refer to WQPN 25)? Yes ☒ No ☐ N/A ☐
Is the Premises subject to any other Acts or subsidiary regulations (e.g. *Dangerous Goods Safety Act 2004, Environmental Protection (Controlled Waste) Regulations 2004, State Agreement Act xxxx*)	Yes ☒ No ☐	*Environmental Protection (Unauthorised Discharges) Regulations 2004*
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes ☐ No ☒	
Is the Premises subject to any EPP requirements?	Yes ☐ No ☒	
Is the Premises a known or suspected contaminated site under the *Contaminated Sites Act 2003*?	Yes ☒ No ☐	Classification: remediated for restricted use (RRU) Date of classification: 7 June 2018