

# Environmental Assessment and Management Plan

Wastewater Treatment Plant



Prepared for BBB Remote Services

April 2025

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## 1 Introduction

BBB Remote Site Services (BBBRSS) is seeking a works approval for a wastewater treatment plant (WWTP) to service a temporary 189-room workers' accommodation camp at the King Rocks Wind Farm in Hyden, Western Australia (WA). The project supports a renewable infrastructure development and will operate for 24 months on privately owned crop field land with options to extend for another 18 months maximum. The WWTP is proposed to be included within the camp complex and has been designed to treat up to 50 kilolitres per day (kL/day), which is above the threshold of 20kL/day for oversight by the Department of Health (DoH) in accordance with the State Government Sewage Policy<sup>1</sup>.

Therefore, a Works Approval from the Department of Water and Environmental Regulation (DWER) is required for construction and time-limited operations of the WWTP under Category 85 – Sewage Facility (the Project). Following construction, which is anticipated to commence in June 2025, a licence application will be lodged to enable plant operation after the time-limited period.

This Environmental Assessment and Management Plan (EAMP) has been prepared to support the Works Approval application for the WWTP by outlining the existing environmental attributes, detailed designs, proposed construction works, and environmental management measures to be implemented.

## **1.1** Purpose and Scope

The objectives of this EAMP are to:

- Describe the current environmental and social values on and surrounding the Site;
- Describe in detail the proposed development, including design, operations and associated benefits;
- Identify any potential impacts to environmental and social aspects associated with the Project;
- Develop environmental engineering and management measures to ensure that all potential impacts are managed to appropriate standards;
- Undertake a residual risk assessment in accordance with the DWER's *Guidance Statement: Risk Assessments* (2017); and
- Demonstrate that the proposed management measures adequately manage potential environmental risks.

To achieve these objectives, the EAMP includes the following sections:

- Site Information;
- Infrastructure Design;
- Operational Aspects;
- Potential Environmental Impacts and Management;
- Residual Risk Assessment; and
- Conclusion.

<sup>&</sup>lt;sup>1</sup> Government Sewerage Policy – Explanatory Notes. Stage Government of Western Australia. September 2019.



## 1.2 Background

Synergy has been granted approval for the development of a wind farm over two freehold lots on King Rocks Road North, Hyden. Planning Solutions and Synergy on behalf of the landowners (Hyden Progress Association Inc.) have since submitted a separate development application for the construction of a workforce accommodation facility (the Site) on Lot 192 Hyden-Mt Walker Road, Hyden to accommodate workers during the construction of the King Rocks Wind Farm. The option area for the lease is approximately 36.82 hectares (ha); however, the development area is proposed to cover 23.16ha on the north-west section of Lot 192.

As part of the Site development a WWTP and irrigation field will be constructed to treat and dispose of liquid waste. The WWTP will utilise a Sequencing Batch Reactor (SBR), a well-established biological treatment process designed for wastewater treatment and a secondary Polishing Filtration Plant (Polishing Plant). This system ensures low energy consumption, reduced sludge production, and ease of maintenance, making it an environmentally sustainable solution. This designer and installer of the WWTP is Centurion Water & Wastewater Solutions Pty Ltd (Centurion), which is, like BBBRSS, a wholly owned subsidiary of Centurion Group.

The plant is designed to treat 50kL/day of domestic sewage, producing Class C (Low Risk) effluent, which will be discharged via controlled irrigation in accordance with regulatory requirements. The modular construction of the system allows for rapid deployment and scalability, ensuring compliance with Australian Standards and site-specific conditions.

### **1.2.1** Stakeholder Consultation

A number of agencies were consulted during the planning stages of the Site. The following sections outline this consultation.

#### **1.2.1.1** Community Consultation

In August 2024, a community survey and community group meetings were held to inform on the development of the Site and identify any community concerns. Resources provided included fact sheets, letterbox drops, electronic updates, community drop-in sessions and a website.

On January 9, 2025, a Development Advertisement (DA) was posted on the Shire of Kondinin's website outlining the site development and providing avenues for written feedback. The DA was advertised for a minimum 14-day period, via public notice circulated in the locality. During the advertising period no formal written submissions were received.

Synergy formally applied for the DA as a form of best practice even though the project technically fulfills the requirements for a Public Works Exemption under the *Planning and Development Act 2005*. Undertaking the DA process ensured that the community was made fully aware of the project and had the opportunity to raise their questions and/or concerns.

#### 1.2.1.2 Traditional Owner Consultation

Discussions were held with the Ballardong Aboriginal Community (BAC) on several occasions starting in July 2024. The BAC Cultural Advice Committee advised that a heritage survey was required for the Site, this survey has been completed and is discussed in Section 2.7.3.



#### 1.2.1.3 Local Services

In October 2024, meetings were held with local services to discuss plans for fire management, healthcare provision, and security, as well as local job opportunities. The following services were engaged and provided their feedback on the proposed Site:

- St. John Ambulance
- Hyden Volunteer Fire and Rescue Service
- Kondinin Hospital
- Kondinin Police
- Department of Primary Industries and Regional Development
- Water Corporation
- Western Power

#### **1.2.1.4** Department of Water and Environmental Regulation

On 10 January 2025, the DWER provided some initial feedback on the Project and noted that the current plans for the Site were insufficient in relation to the proposed WWTP to adequately assess its compliance under the *Environmental Protection Act 1986* (the EP Act). Therefore, this EAMP aims to support a works approval application and subsequent licence application to address the DWER's concerns and licence the Site as a Prescribed Premises.

#### **1.2.1.5** Department of Health

Due to significant time constraints for the project, BBBRSS has submitted an approval application for the installation of the WWTP with the DoH (Application Reference 72.25) since initial operations in the first few months will be below the 20kL/day threshold. This will allow for the DWER to complete its assessment of this application without impacting project timeframes. A copy of the cover letter submitted to the DoH is provided in Appendix L.

#### 1.2.2 Wastewater Treatment Guidelines

The DWER is responsible for managing and protecting WA's water resources and routinely publishes Water Quality Protection Notes (WQPN) that provide guidance and advice on acceptable practices used to protect the quality of WA's water resources. *WQPN #22: Irrigation with nutrient-rich wastewater* (WQPN #22) provides advice on the design, construction and operation of waste stabilisation pond systems (e.g. liquid waste facilities) in WA to ensure effective retention of liquids in the ponds and environmental performance.

The Department of Health's (DoH) *Guidelines for the Non-potable Uses of Recycled Water in Western Australia (2011)* (Recycled Water Guideline) provides a framework for the safe and sustainable use of recycled water for non-potable applications, including irrigation.

Therefore, the Project will defer to both of these guidelines to ensure that its design, construction, and operation is in accordance with industry best practice.



## 2 Site Information

The following sections provide an overview of the key aspects of the Site, including its location, layout, licencing, surrounding land uses, separation distances from sensitive receptors, and environmental and social attributes.

## 2.1 Site Location and Information

The Site is located approximately 450 metres (m) north of the town of Hyden, Western Australia (WA). The Site encompasses approximately 23.16ha and is located on Mount Walker-Hyden Rd, Hyden on Lot 192. The WWTP is proposed to be located in the southern portion of the Site.

The Site locality is shown in Figure 1, located in Appendix A. The Site's cadastre information is outlined in Drawing S07, presented in Appendix B.

## 2.2 Site Layout

The proposed WWTP will consist of the following infrastructure elements:

- Wastewater pump station;
- SBR tank measuring approximately 12.2m x 2.4m x 2.9m;
- 50kL SBR balance tank;
- 50kL sludge tank;
- 14kL Polishing Plant balance tank;
- Two 36x72" Fibre-reinforced vessels with glass filtration media; and
- 11kL effluent tank which will be used for irrigating a 18,423m<sup>2</sup> field.

The Site layout is shown in Drawing S07, presented in Appendix B.

## 2.3 Site Licencing

Following construction of the WWTP, BBBRSS will be submitting an application to DWER to licence the facility as a Category 85 (sewage facility) Prescribed Premises under Part V of the *Environmental Protection Regulations 1987*.

## 2.4 Zoning and Surrounding Land Use

The Site is owned by Hyden Progress Association Inc. and is leased by Synergy. The Site is currently situated on rural land under the Shire's Local Planning Scheme and is bound by Hyden Mount Walker Road to the west and agricultural lots on the remaining sides.

The land immediately surrounding the Site is zoned as a 'Rural' land, however land 300m to the north of the Site is zoned as 'Environmental Conservation Reserve'. The Hyden townsite zoning is 130m south of the southwest corner of the Site and includes a mixture of 'Light Industry', 'Public Purposes' and 'Residential' land.

The surrounding land zoning and uses are shown in Figure 2, which is provided in Appendix A.



### 2.5 Industry Separation Distances and Sensitive Receptors

The WA Environmental Protection Authority's (EPA's) *Guidance Statement No. 3 – Separation Distances between Industrial and Sensitive Land Uses 2005* (Guidance Statement 3) contains the recommended minimum separation distances between industrial activities, including waste management facilities and sensitive land uses.

Sensitive land uses are defined as those that are sensitive to industrial emissions and include residential developments, schools, hospitals, shopping centres and other public areas and buildings. The recommended minimum separation distances between sensitive land uses and the Site's activities is shown in Table 2-1.

Cabaaaaaa	1		In	Recommended			
Category	Industry	Gaseous	Noise	Dust	Odour	Risk	(m)
85	Wastewater disposal site				~	~	Case by case
	Wastewater treatment plant	~	~		~	~	Not available*

Table 2-1	FPA Recomm	ended Senarati	on Distances f	from the Pro	nosed Industry	Δctivities
Table Z-T.	EFA Recomme	enueu separati	UII Distances I	Tom the FIO	poseu muusu y	ACTIVITIES

\*EPA has yet to provide guidance as buffer studies in progress to determine appropriate separation distances

The closest sensitive receptor is the Whispering Gums care facility, located approximately 280m south of the Site; however, it is approximately 530m from the WWTP and 610m from the Irrigation Field. The closest single residential property are located 440m south of the WWTP and 625m south of the Irrigation Field. The sensitive receptors and their distances from the Site are shown in Figure 3. The potential impacts of odour as well as the elevated levels of off-site risk to the community from the proposed activities will be managed to appropriate best practice standards and are discussed further within Section 5.

## 2.6 Environmental Attributes

The following sections provide details on the key environmental attributes of the Site, including climate, topography, geology, flora and fauna.

#### 2.6.1 Climate

The Site experiences a semi-arid climate according to the Bureau of Meteorology (BOM). The local climate is characterised by hot, dry summers and mild winters, with low and variable annual rainfall, predominantly occurring in winter. The average monthly rainfall from 1928 to 2023 and the mean maximum and mean minimum temperatures from 1970 to 2023 recorded at Hyden (BOM Station Number: 010568) are provided in Table 2-2. Pan evaporation is not recorded at this station, and this data has been sourced from SILO, which is a database of Australian climate data from 1889 to the present that is hosted by the Queensland Department of Environment and Science (DES). SILO constructs datasets from observational data obtained from BOM, using mathematical interpolation techniques to infill gaps in time series and construct spatial grids.

Table 2-2: I	<b>Monthly Climate</b>	Statistics	Summary fr	om 1893 –	2023
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Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean Rainfall (mm)	19	21	22	24	39	48	47	41	27	22	20	14	343



Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean Evaporation (mm)*	298	243	208	130	83	58	60	76	111	173	224	283	1,947
Mean Max Temp (°C)	34	33	30	26	21	18	17	18	21	25	29	32	25
Mean Min Temp (°C)	16	16	14	11	8	6	5	5	6	9	12	14	10

\*Note: Data is collated from 1970 to 2023

The annual average rainfall recorded at Hyden is 343mm, with the minimum and maximum monthly values ranging from 19mm and 48mm, respectively. The average annual potential evaporation rate is approximately 1,947mm, which is nearly 6 times the average annual rainfall.

Diagram 4-1 indicates that winds are predominantly easterly in the morning (9am), changing into predominantly westerly in the afternoons (3pm).



Diagram 4-1: 9am (left) and 3pm (right) Wind Rose for Hyden

#### 2.6.2 Topography

The Geoscience Australia 'Surface Geology' dataset indicates that the topography across the whole Site is relatively flat and is below 300m Australian Height Datum (AHD), as shown in Figure 4, available in Appendix A.

In January 2025, Galt Geotechnics (Galt) undertook a geotechnical and geological investigations at the Site and the subsequent geotechnical study<sup>2</sup> outlines that the Site is relatively flat, with elevations ranging between 294mAHD and 296mAHD.

<sup>&</sup>lt;sup>2</sup> Geotechnical Study Proposed Workers Camp Development WAE240126-01 001 R RevA DRAFT. Galt Geotechnics. January 2025 (Geotechnical Study)



### 2.6.3 Geology

According to the 'Surface Geology – Geoscience Australia' data set the Site consists of both a Czs and Qdlu surface geologies, mapping is presented in Figure 5 and provided in Appendix A.

According to Galt's Geotechnical Study<sup>2</sup>, the Site consists of a surficial layer of topsoil overlaying a 1-2m deep layer of clayey sands, which transitions into sandy clay as greater depths. The in-situ soil permeability is generally low but could potentially be erodible once disturbed.

The Site's surface geology has been classified as an M-D under *Australian Standard (AS) 2870-2011*, assuming no less than 1m of clayey sand overlays the sandy clay. This classification indicates that the soil is expected to experience moderate ground movement due to moisture changes, with ground movement potentially extending deeper than typical, likely due to moisture fluctuations at greater depths. In areas where the clayey sand layer is less than 1m, a more reactive H1-D classification would apply. Further information is outlined in the Geotechnical Report, which is provided in Appendix C.

#### 2.6.4 Hydrogeology

Galt's Soil Evaluation Report<sup>3</sup> noted that groundwater was observed at depths of 2.3m to 2.9m across test pits. The report also notes that there is a potential for perched water near the surface following rainfall. A turkey's nest (man-made water storage) located 700m east of the Site contained visible groundwater. The Soil Evaluation Report is provided in Appendix D.

#### 2.6.5 Hydrology

The Site is located within the Lockhart River Catchment, which is a sub-catchment of the Avon River Basin. The Lockhart Catchment covers an approximately 28,700km<sup>2</sup> area with agriculture being the dominant land-use.

No natural surface water bodies are located within the Site; however, the 'Hydrology – Geoscience' data set indicates that a non-perennial water course runs through the northwest of the Lot Boundary and adjacent to the northwestern corner of the Site before flowing southerly direction toward the Hyden townsite.

Lake Gounter is located approximately 750m to the northeast of the Site. Lake Gounter is designated as a Nature Reserve and covers approximately 32.92km<sup>2</sup> and is managed by the Department of Biodiversity, Conservation and Attractions (DBCA).

The locations of the surface water bodies in proximity to the Site are provided in Figure 5, presented in Appendix A.

#### 2.6.6 Flora, Fauna and Vegetation

#### 2.6.6.1 Threatened and Priority Fauna

A search of the DBCA's database indicated that there were no records of threatened or priority fauna being present at the Site; however, several species were identified in areas surrounding the Site, as described in Table 2-3.

<sup>&</sup>lt;sup>3</sup> Site and Soil Evaluation Proposed Workers Camp Development WAE240126-01 002 R Rev0. Galt Geotechnics. January 2025 (Soil Evaluation Report)



#### Table 2-3: Threatened and Priority Fauna

Type/Classification	Distance from Site
Priority 4	720m south
Threatened Species	740m south

Threatened and priority fauna mapping is presented in Figure 6, in Appendix A.

#### 2.6.6.2 Declared Rare and Priority Flora

The DBCA's Threatened and Priority Flora Database indicate that there are no rare or priority flora present within or directly surrounding the Site. Several priority species were identified in areas surrounding the Site, as described in Table 2-4.

#### Table 2-4: Rare and Priority Flora

Type/Classification	Distance from Site
Priority 2 Flora	1,700m southwest
Priority 3 Flora	1,600m east

Threatened and priority flora mapping is presented in Figure 6, in Appendix A.

#### 2.6.6.3 Threatened and Priority Ecological Communities

A search of the DBCA's Priority Ecological Communities (PECs) database indicates that a Threatened Ecological Community is located within the Lot boundary and the surrounding areas. There is no Threatened or Priority Ecological Community mapped within the Site. The Site has historically been cleared of all native vegetation.

PEC mapping is presented in Figure 6, in Appendix A.

#### 2.6.6.4 Project-Specific Survey

WSP was engaged by SynergyRED to undertake a flora, vegetation, and fauna survey for the proposed project. WSP was engaged in September 2023 (Phase 1) and January 2024 (Phase 2) to undertake an initial reconnaissance survey. Subsequently to those initial surveys, WSP was engaged to undertake a Flora, Vegetation and Fauna survey<sup>4</sup> for the project, including the Site. The purpose of the survey was to assess the flora, vegetation, and fauna values within the survey area and to identify any significant flora, vegetation and fauna populations that may be impacted by the project.

The key findings of the survey relevant to the Site include the following:

- No threatened or priority flora species were recorded within the survey area.
- No threatened or priority flora species are considered likely to occur.
- No conservation significant fauna species were recorded within the survey area.

<sup>&</sup>lt;sup>4</sup> Flora, Vegetation and Fauna Survey - King Rocks Development Support: Site Selection for Workforce Accommodation Camp. WSP. March 2025



- The survey area contains no natural waterways or wetlands, therefore potential impacts on the listed birds associated with water bodies are also minimal.
- Most of the habitat structure is situated on clay loam brown flats, comprising *Eucalyptus* sp. open forest over *Allocasurina* sp. and *Acacia* sp. shrublands over non-native flora species.
- From a preliminary review of Carnaby's habitat, if native vegetation clearing requirements are determined to be greater than or equal to 1 ha of foraging habitat and the score is more than 4 (as the score is 6), then a proposed development would need to be referred under the EPBC Act.

A copy of the survey report is provided in Appendix M.

#### 2.6.7 Bushfire Prone Areas

The northern portion of the lot boundary is mapped as a Bushfire Prone Area according to the Western Australian State Bushfire Prone Areas dataset. However, the Site boundary itself is not located within this mapped area, meaning the direct risk to the facility is minimal. While the Site is not within the designated Bushfire Prone Area, fire management measures will still be considered to ensure safety and compliance with relevant regulations. The Bushfire Prone Areas are presented in Figure 7, in Appendix A.

#### 2.6.8 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared in *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* as areas that cover any and/or all of the following conservation significant areas:

- A declared World Heritage property as defined in section 13 of the *Environment Protection* and *Biodiversity Conservation Act 1999*;
- An area that is included on the Register of the National Estate, because of its natural heritage value under the *Australian Heritage Council Act 2003*;
- A defined wetland and the area within 50 metres of the wetland;
- The area covered by vegetation within 50 metres of rare (threatened) flora, to the extent to which the vegetation is continuous with the vegetation in which the rare (threatened) flora is located;
- The area covered by a TEC;
- A Bush Forever site listed in "Bush Forever" Volumes 1 and 2 (2000), published by the Western Australia Planning Commission, except to the extent to which the site is approved to be developed by the Western Australia Planning Commission;
- The areas covered by the following policies:
  - The Environmental Protection (Gnangara Mound Crown Land) Policy 1992 available from EPA website. This policy has been repealed;
  - The Environmental Protection (Western Swamp Tortoise) Policy 2002 refer to the "EPP 2003 Western Swamp Tortoise Policy Boundary";
  - The areas covered by the lakes to which the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992 applies. This policy has been repealed;
  - Protected wetlands as defined in the Environmental Protection (South West Agricultural Zone Wetlands) Policy 1998. This policy has been repealed; and



 Areas of fringing native vegetation in the policy area as defined in the Environmental Protection (Swan and Canning Rivers) Policy 1998. This policy has been repealed.

There are no ESAs within or directly surrounding the Site.

### 2.7 Social Attributes

The social attributes of the Site include Native Title, Aboriginal Heritage, European Heritage and Mining Tenements and are discussed in the following sections.

#### 2,7,1 Native Title

A search of Landgate indicates that Native Title does not exist at or surrounding the Site.

#### 2.7.2 Aboriginal Heritage

Aboriginal Heritage sites (registered or not) are protected under the *Aboriginal Heritage Act 1972* (AH Act) and the *Aboriginal Cultural Heritage Act 2021* (ACH Act). An Aboriginal Heritage Site under Section 5 of the AH Act is defined as:

(a) any place of importance and significance where persons of Aboriginal descent have, or appear to have, left any object, natural or artificial, used for, or made or adapted for use for, any purpose connected with the traditional cultural life of the Aboriginal people, past or present;

(b) any sacred, ritual or ceremonial site, which is of importance and special significance to persons of Aboriginal descent;

(c) any place which, in the opinion of the Committee, is or was associated with the Aboriginal people and which is of historical, anthropological, archaeological or ethnographical interest and should be preserved because of its importance and significance to the cultural heritage of the State;

(d) any place where objects to which this Act applies are traditionally stored, or to which, under the provisions of this Act, such objects have been taken or removed.

A search for relevant Aboriginal Heritage sites was conducted using the Department of Aboriginal Affairs (DAA) online Aboriginal Heritage Inquiry System (AHIS). Reported Aboriginal Heritage sites are categorised according to the assessment status of each place under the AH Act, as listed in Table 2-5.

Category	Sub- Category	Assessment Status	Protected under the AH Act
Registered Aboriginal Site	N/A	Site has been assessed as meeting Section 5 of the AH Act	Yes
Other Registered	Lodged	Information has been received. Assessment has not been completed to determine if a site meets Section 5 of the AH Act	Yes (temporary)
Flace	Stored Data/Not a Site	Site has been assessed as not meeting Section 5 of the AH Act	No

Table 2-5: A	boriginal	Heritage	Site As	sessment	Categories
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The results of the search indicate that 2km east of the Site the following Reported Aboriginal Heritage sites are located:



- 'Registered Aboriginal Site', Site 21387 Wave Rock. Wave Rock was assessed and met the Aboriginal Heritage Site definition under Section 5 of the AH Act.
- 'Registered Aboriginal Site', Site 4438 Wave Rock Scarred Tree. Wave Rock Scarred Tree was assessed and met the Aboriginal Heritage Site definition under Section 5 of the AH Act.
- 'Registered Aboriginal Site', Site 5840 Hyden Rock. Hyden Rock was assessed and met the Aboriginal Heritage Site definition under Section 5 of the AH Act.

The aboriginal heritage areas are shown in Figure 8, in Appendix A.

#### 2.7.3 Aboriginal Survey

Archae-Aus conducted an archaeological and ethnographic survey<sup>5</sup> at the Site in November 2024, published preliminary advice in December 2024 and finalised its advice in February 2025. This advice concluded that no new ethnographic sites and no Aboriginal archaeological sites were identified within the Site.

Additionally, the preliminary advice stated that Traditional Owners present during the survey did not object to the proposed works, provided that two Ballardong heritage monitors are present for all initial ground disturbance works.

The final report by Archae-Aus is provided in Appendix F.

#### 2.7.4 European Heritage

A search of the Government of Western Australia Heritage Council's inHerit online database indicated that the Hyden townsite is listed as a European Heritage site (Heritage Place No.10929) situated to the south of the Site, with the closest border being adjacent to the southwest corner.

The European heritage areas are shown in Figure 8, presented in Appendix A.

#### 2.7.5 Mining Tenements

A review of the Department of Mines, Industry Regulation and Safety (DMIRS) mining tenement data indicated that the Site is not located within any category of mining tenement.

<sup>&</sup>lt;sup>5</sup> Preliminary Advice on an Aboriginal Archaeological and Ethnographic Heritage Survey for a Temporary Accommodation Facility at Hyden. Archae-Aus. December 2024 (Heritage Survey)



## 3 Infrastructure Design

The following section outlines BBBRSS's proposed WWTP infrastructure at the Site.

### 3.1 Proposed Design

The WWTP utilises both biological and physical treatment processes to remove organic matter, nutrients, and suspended solids while producing treated effluent suitable for disposal. The system operates in a batch cycle, allowing for controlled treatment stages, including filling, aeration, settling, decanting, sludge wasting and filtration. The WWTP requires a pumped flow, and therefore, a suitably sized pumping station will be constructed.

The WWTP will consist of two containerised systems; an SBR system housed inside a 67m<sup>3</sup> sea container, as well as a Polishing Plant housed inside a 33m<sup>3</sup> sea container. The WWTP and associated infrastructure will be constructed on a compacted hardstand with a surface area of approximately 915m<sup>2</sup>.

Wastewater enters the plant through an inlet screen, which removes inorganic materials before temporary storage in a balance tank to regulate flow. The wastewater is then pumped into the SBR tank, where microorganisms break down organic pollutants. The treatment process includes an anoxic phase for de-nitrification and an aerobic phase for biological oxidation of organic matter (BOD removal). After solids settle at the bottom of the tank, clear effluent is decanted and transferred to the Polishing Plant for secondary treatment. Excess sludge is pumped to a sludge storage tank for offsite removal to an appropriately licenced facility.

In the Polishing Plant the effluent undergoes media filtration to remove any remaining suspended solids. Effluent is then transferred to the irrigation tank for final disinfection using sodium hypochlorite before disposal to the irrigation field. The process ensures that the final effluent meets Class C (Low Risk) standards before being discharged to the irrigation field.

Drawings developed for these works are provided in Appendix B. The *SBR Wastewater Treatment Plant - Control Philosophy* provided by Centurion Water & Wastewater Solutions (Centurion), outlines the SBR instrumentation and design, and is provided in Appendix H.

## **3.2** Capacity Assessment

The tank sizing was based on 189 camp personnel with a daily water consumption of 180L/person/day, which equates to 34,020L/day, and it is assumed there will be 2,600L/day backwash for a total of 36,620L/day. The hydraulic capacity of the WWTP is 50,000L/day, providing an additional 25% contingency.

### 3.3 Project Timeline

The estimated project timeline for the delivery of the proposed infrastructure improvements is shown in Table 3-1. These timeframes may vary due to approval assessment periods and contractor timetables.



#### Table 3-1: Estimated Project Timeline

Aspect	Timeline
Earthworks commences (For workers camp only)	May 2025
Construction	June 2025
Commissioning and Operation	July 2025

BBBRS requests that the DWER grant approval for time limited operations for the Site until such time a licence is granted. It is understood that the maximum period for time limited operations is 180 days and therefore BBBRS wish to seek this timeframe to mitigate any potential risks associated with delays during the assessment stage for the licence application. As it is BBBRS' aim to establish the new Site infrastructure as soon as possible, the time limited operations period will ensure the Site is operational as soon as it is constructed, in accordance with the Works Approval conditions and detailed designs.

BBBRS recognises that the DWER's target for assessment timeframes is 60 business days, which may impact the current project schedule as outlined in Table 3-1. Therefore, as discussed in Section 1.2.1.5, BBBRSS has submitted an approval application for the installation of the WWTP with the DoH (Application Reference 72.25) since initial operations in the first few months will be below the 20kL/day threshold. This will allow for the DWER to complete its assessment of this application without impacting project timeframes. A copy of the cover letter submitted to the DoH is provided in Appendix L.

### 3.4 Construction Quality Assurance

The design of both the SBR and Polishing Plant are containerised and will be predominantly constructed by the manufacturer prior to arrival to the Site. To ensure the materials and construction of the WWTP meets the design criteria, a number of documents have been developed by BBBRS to guide construction and installation of the Project, including the following:

- SBR Wastewater Treatment Plan Installation, Operation & Maintenance Manual;
- Polishing Filtration Plant Installation, Operation & Maintenance Manual;
- SBR Wastewater Treatment Plan Control Philosophy;
- KRWF Camp Construction Management Plan;
- SBR Equipment Schedule; and
- Polishing Plant Equipment Schedule.

The installation specification for the SBR and Polishing Plant will be provided by the manufacturer at the time of purchase and will be of industry-standard.

Copies of the construction and operational documentation for the Project are provided in Appendix G, Appendix H, Appendix I and Appendix J.



## 4 **Operational Aspects**

The operational aspects of the proposed WWTP are discussed in the following sections.

#### 4.1 Waste Acceptance

The Site is requesting to be licensed to accept 50kL/day of sewage waste; however, the estimated throughput is anticipated to be approximately 36.6kL/day.

Raw sewage is transported to the WWTP via sewage pump station, located within the Site to adequately receive the sewer network. Sewage is transferred from the main camp lift station to the 2mm automatic bar inlet screen. The screened sewage, or influent, then uses gravity to flow into the balance tank which provides a buffer to peak inflows. The balance tank is fitted with an external mixer pump to inhibit settlement of solids and to provide a homogenous influent feed. A balance pump then delivers influent to the SBR tank at a constant flow rate at the beginning of the next treatment cycle.

## 4.2 Sewage (Secondary) Treatment

The SBR system operates for four hours per cycle, enabling a 6-cycle per day sequence, consisting of the following steps:

- 1. Filling of the reactor basin in anoxic conditions
- 2. An aerobic reaction phase
- 3. A settling phase
- 4. A decant phase
- 5. An idle phase

The reaction phase is a combination of anoxic and aerobic phases to achieve high levels of BOD and nitrogen removal. Micro-organisms consume the pollutants in the influent, producing flocculant particles which are separated in the SBR tank during the decanting period at the end of the treatment sequence. The SBR tank is equipped with two aerators that supply oxygen for biological treatment, as well as mix and suspend solids during anoxic phase in the SBR tank.

A decant pump is used to transfer the influent from below the surface of the SBR tank leaving a clear effluent that is low in BOD and TSS. The treated effluent is transferred from SBR tank and dosed with chlorine for disinfection prior to the irrigation tank.

The SBR design is based on the influent and effluent specifications outlined in Table 4-1.

Aspect	Influent	Effluent
Hydraulic Capacity (kL/day)	36.62	36.62
BOD (mg/L)	350	<20
TSS (mg/L)	350	<30
TN (mg/L)	60	<10
TP (mg/L)	14	<1

#### Table 4-1: Influent and Effluent Design Specifications



Aspect	Influent	Effluent
pH (pH units)	6.5 - 8.5	6.5 - 8.5
E Coli (cfu/100mL)	-	<1000
Chlorine (mg/L)	-	0.2 - 2.0

Waste sludge is removed from the SBR daily by the sludge pump and transferred to the sludge tank to be aged. This material is retained for 20-30 days to remove any pathogen, where is then removed and disposed of at appropriately licenced facility.

The SBR will be managed as outlined in the SBR Wastewater Treatment Plan - Installation, Operation & Maintenance Manual provided by Centurion, presented in Appendix I.

## 4.3 Effluent (Tertiary) Treatment

Once effluent is treated by the SBR it is transferred to the Polishing Plant where it flows into two glass media filtration vessels (Filtration Vessels). The effluent then passes through a high-flow 1-micron nominal cartridge filter.

To ensure media filters are operating optimally the differential pressure will be used to determine when backwash is required in the Filtration Vessels. At a pre-set differential pressure, the media filters will be automatically backwashed sequentially. Backwash water will be recirculated to the balance tank in the SBR system. Similarly, the differential pressure across the 1-micron cartridge filter will be used to alert operators that the filter cartridge needs replacing.

The Polishing Plant will be managed as outlined in the *Polishing Filtration Plant* - *Installation, Operation & Maintenance Manual* provided by Centurion, presented in Appendix I.

### 4.4 Irrigation Field

Once the treated effluent is treated in the irrigation tank, it will be transferred to the irrigation system and systematically discharged across a designated field of 18,423m<sup>2</sup>. Treated effluent will be discharged using a drip irrigation system.

These discharges will be regulated by several controls within the Site's operational licence, granted by the DWER, to ensure nutrient loading is managed and there are no significant environmental impacts.

## 4.5 Equipment and Machinery

The following outlines the equipment and machinery associated with the proposed WWTP:

- Mechanical Equipment:
  - Bar Inlet Screen (2.5mm) removes inorganic material
  - Balance Pump (50m³/hr @ 10m) buffers peak inflows
  - Sucrose dosing system- provides a carbon source for nitrogen reduction
  - Poly Aluminium Chloride Dosing System facilitates phosphorus removal
  - SBR Tank (49m<sup>3</sup>) facilitates BOD removal, nitrification, de-nitrification, and solids clarification



- o Submersible Aerator/Mixer- supplies oxygen and maintains mixing
- Decant Pump (35m<sup>3</sup>/hr @ 7.8m) transfers clear effluent to irrigation tank
- Sludge Pump (15m<sup>3</sup>/hr @ 6m) transfers waste sludge to the sludge tank
- Irrigation Pump (10m<sup>3</sup>/hr @ 50m) discharges treated effluent to the irrigation field
- Recirculation Pump (5.5m<sup>3</sup>/hr @ 10m) maintains effluent mixing
- Feed/Backwash Pump (12m<sup>3</sup>/hr @ 450kPa) transfer effluent to the Polishing Plant balance tank
- Filtration Vessels (0.9m x 1.8m) filters secondary effluent
- Cartridge Filter and housing (1-micron) filters secondary effluent
- Sodium Hypochlorite Dosing System provides final sterilization
- Storage Tanks:
  - SBR Balance Tank (50m<sup>3</sup>) buffers peak inflows
  - Polishing Plant Balance Tank (14m<sup>3</sup>) buffers peak inflows
  - Irrigation Tank (11m<sup>3</sup>) stores treated effluent
  - Sludge Tank (50m<sup>3</sup>) stores waste sludge prior to removal

The associated equipment schedules are provided in Appendix J.

### 4.6 Staffing

The WWTP will be managed by village accommodation site services staff and will be monitored daily.

### 4.7 Maintenance and Monitoring

All monitoring and maintenance tasks are to be conducted in accordance with Centurion Water & Wastewater Solutions' (Centurion's) documentation including:

- SBR Wastewater Treatment Plan Installation, Operation & Maintenance Manual;
- Polishing Filtration Plant Installation, Operation & Maintenance Manual; and
- SBR Wastewater Treatment Plan Control Philosophy.

A daily log sheet will be utilised to monitor the operation of infrastructure, relevant levels and flow rates and aesthetic and quality parameters of effluent. The completed log sheet will then be emailed by Site staff to Centurion weekly or more often if there is any cause for concern that the system performance is changing significantly. The Daily Log Sheet template is provided in Appendix K.

At a minimum, all infrastructure will be inspected on a daily basis.



## **5 Potential Environmental Impacts and Management**

The potential impacts associated with the Site are discussed in the following sections, namely:

- Stormwater & Liquid Waste;
- Odour;
- Dust;
- Noise;

- Fire;
- Traffic; and
- Security.

The following sections outline the key proposed environmental management measures to be implemented at the Site.

### 5.1 Stormwater & Liquid Waste

Leaks from the WWTP may lead to the release of untreated or partially treated wastewater or sludge into the environment, causing localised contamination and potential risk to surrounding soil and water depending on severity. Stormwater runoff may carry contaminants from the WWTP area, such as chemicals, oils, or debris, potentially affecting soils and groundwater at the Site. As outlined in Section 2.6.3, the soils at the Site are characterised by low permeability, which means that infiltration may be limited, increasing surface water runoff instead of groundwater recharge.

The proposed WWTP housing infrastructure is intended to contain any leakages where possible, providing secondary containment until the leak can be fixed.

As discussed in Section 3.4, a series of construction and operation documentation have been developed to ensure that the WWTP system is installed to best practices standards, mitigating environmental impacts.

The proposed management measures to be implemented for the Site to manage stormwater and liquid waste include:

- The WWTP will be surrounded by containment bunding;
- The final levels around the Site's WWTP system ensure that stormwater run-off flows away from infrastructure;
- All stormwater engineering features will be inspected regularly, and maintenance works scheduled appropriately; and
- Monitoring of meteorological conditions (i.e., storm events).

These proposed measures are considered to be sufficient to mitigate risks from stormwater and liquid waste at the Site to an acceptable level.

## 5.2 Odour

There is the potential for odours to be generated during the regular operations of the WWTP due to the decomposition of organic matter in the SBR system as well as the sludge tanks. However, the generation of odour from the WWTP is expected to be minimal since the tanks are fully enclosed. As camp is in close proximity to the WWTP, there is potential of odour emissions impacting amenity at the worker's camp. Therefore, the key odour management measures to be implemented include:



- Any desludging operations will be limited to a brief period on a regular, scheduled basis and will not be undertaken during periods of high winds or when prevailing winds are in a north or north easterly direction;
- The WWTP will undergo regular monitoring and maintenance to ensure optimal operation, especially during anaerobic conditions;
- A stakeholder engagement log (i.e., complaints register) will be maintained to ensure that the community offsite can express their comments or concerns regarding the operations of the Site; and
- Odour levels across the WWTP will be monitored by staff and action will be taken if required.

The management measures outlined within this EAMP are considered suitable for managing the risk associated with odour at the Site to an acceptable level.

## 5.3 Dust

Clearing and construction activities at the Site have the potential to generate dust, with the possibility of impacts to nearby vegetation, reducing amenity and health impacts. The key activities that will generate dust include the removal of vegetation and topsoil during site clearing, earthworks during construction and the movement of vehicles and machinery throughout the Site. Following the works, operational activities at the WWTP have a low risk of generating dust.

To manage potential impacts arising from dust, the key management measures to be implemented include:

- Vehicles must maintain a maximum speed of 20km/hr unless otherwise posted;
- A water cart will be utilised on unsealed roads, stockpiles and other operations as deemed necessary during construction works; and
- All works will cease during periods of strong winds.

The management measures outlined within this EAMP are considered suitable for managing the risk associated with dust at the WWTP to an acceptable level.

## 5.4 Noise

Noise emissions will be generated from the proposed construction activities. The majority of these emissions will be generated from the operation of equipment onsite and from road and engine noise from vehicles entering and exiting the Site.

Herring Storer Acoustics' Acoustic Report<sup>6</sup> indicates that the noise emitted from the generators at the Site may potentially be higher than the permissible noise level during the night period as prescribed under the *Environmental Protection (Noise) Regulations 1997* (Noise Regulations), unless suitable mitigation measures are installed. Therefore, construction works are intended to be undertaken during daylight hours, and any operations outside these hours will first be approved by the Shire of Kondinin as required. Table 5-1 outlines the hours of operation outlined for the construction of the Site.

<sup>&</sup>lt;sup>6</sup> Development Application Acoustic Report Kings Rock Wind Farm Accommodation Village Hyden. Herring Storer Acoustics. November 2024



#### Table 5-1: Proposed Hours of Construction

Day	Hours
Monday — Friday	6am — 6pm
Saturdays	6am — 6pm
Sundays	TBD – Approval pending from the Shire of Kondinin
Public Holidays	Nil

An addition to the above, the following noise emission management measures will be implemented at the Site:

- All equipment and machinery will be maintained in good working condition;
- Ensuring all vehicles accessing the Site use the designated access roadways;
- The operation of equipment and machinery during construction will be restricted to operational hours only;
- If required, plant and equipment shall be fitted with appropriate acoustic treatment (i.e., silencers); and
- Vehicles will be restricted to a maximum speed of 20km/hr at the Site.

The management measures outlined within this EAMP are considered suitable for managing the risk associated with noise at the WWTP to an acceptable level.

### 5.5 Fire

The Site is in proximity to natural bushland and crop land and is therefore at risk of being impacted from bushfires originating off-site. There is minimal potential risk of fire associated with WWTP system operations.

To manage the potential impacts of natural bushfires and onsite fires, the following management measures are proposed:

- Establishing and maintaining fire breaks between the Site boundary and surrounding areas;
- Restrictions to smoking on Site;
- Regular maintenance of all equipment, plant, vehicles, and machinery;
- Regular pre-start checks to be undertaken on all vehicles and machinery;
- Fire suppression equipment to undergo regular testing; and
- Induction/training of staff in fire risks, mitigation, and response capability.

The management measures outlined within this EAMP are considered suitable for managing the risk associated with fire at the WWTP to an acceptable level.

## 5.6 Traffic

The proposed development works will result in temporary elevated traffic movements to and from the Site and on the surrounding road network.



Onsite traffic movements have the potential to generate noise, dust and create an occupational health and safety risk to staff. To manage this risk, the following measures will be implemented:

- Appropriate signage will be located throughout the Site and entrance/exit;
- Vehicles and machinery will move through the Site via established roads and tracks only;
- Employees and contractors shall wear high visibility and reflective clothing when working in areas where vehicle movement occurs;
- Vehicles will be restricted to a maximum speed of 20km/hr;
- All Site vehicles and machinery will undergo regular maintenance; and
- Induction will be provided.

The management measures outlined within this EAMP are considered suitable for managing the risk associated with traffic at the WWTP to an acceptable level.

### 5.7 Security

A breach of security may result in injury to persons or damage to infrastructure. To minimise potential security the following management measures will be implemented:

- Appropriate signage will be installed at the Site entrance and surrounding the WWTP;
- A perimeter fence will be installed around the Site as well as the WWTP and will be monitored and maintained on a regular basis; and
- All access gates and buildings will be locked securely outside of operational hours.

The management measures outlined within this EAMP are considered suitable for managing the risk associated with security at the WWTP to an acceptable level.



## 6 Residual Risk Assessment

Each of the potential risks was assessed as per the *DWER Guidance Statement: Risk Assessments - Part V, Division 3, Environmental Protection Act 1986* (February 2017) (Guidance Statement). The objective of the Residual Risk Assessment is to ensure the potential risks associated with the proposed activities are understood and managed appropriately to ensure that there is no unacceptable residual risk. The sources of hazards, pathways and receptors of hazards identified are outlined in the following subsections.

### 6.1 Sources of Hazards

For the purpose of this assessment, a source is defined as a primary risk with the potential to cause significant contamination or harm to the environment. With regards to the environment and public health, sources and its potential hazards which may arise from the various future activities have been identified and are shown in Table 6-1.

Т	able	6-1:	List	of	Potential	Hazards
	_			-		

Source	Description of Hazards
Stormwater & Liquid Waste	<ul> <li>Excessive stormwater not properly managed can lead to flooding and damage to infrastructure</li> <li>Leakage from the WWTP can impact soil and groundwater</li> </ul>
Odour	Odour from liquid wastes can cause amenity issues
Dust	<ul> <li>Dust generated during clearing, construction and operational activities onsite may be inhaled by staff potentially resulting in health impacts and reduced visibility</li> <li>Excessive dust may impact surrounding vegetation and flora</li> </ul>
Noise	<ul> <li>High levels of occupational noise can impact personnel onsite</li> <li>Noise can cause reduced amenity for surrounding sensitive receptors</li> </ul>
Fire	Potential for fires in equipment or in surrounding bushland
Traffic	• Poor design of traffic flow and operations can lead to unpredictable traffic routes and create safety hazards for Site personnel
Security	• Unauthorised personnel may access the Site resulting in a security breach of the Site facilities, plant and equipment

## 6.2 Pathways for Hazards

For the purpose of this assessment, a pathway for a hazard is defined as the route by which potential contamination or harm can migrate. The key migration pathways for a waste management facility generally include the following:

- Air through which lightweight materials, such as dust, litter and odour can travel;
- Surface along which the sources of contamination or harm can travel or be present at (e.g. surface water runoff, litter, persons walking or working over the surface); and
- Sub-surface whereby the underlying soils, bedrock, aquifers and infrastructure permit infiltration of leachate, chemicals and other hazardous materials.



## 6.3 Receptors of Hazards

For the purpose of this assessment, a receptor is defined as the location where the impact of the contamination or harm is registered. The possible generic receptors of the contamination or harm cause by the identified hazards are summarised in Table 6-2.

Table 6-2: Generic Rece	ptors that May b	be Impacted by	Potential	Contamination or Harm

Receptor	Description of the Receptor
Surrounding Land Users	<ul> <li>People who work or live beyond the boundary of the Site. Some of these are referred to as sensitive receptors</li> </ul>
Site Users	<ul> <li>Persons authorised to traverse across the site, including:         <ul> <li>Customers using the Site;</li> <li>Operational staff;</li> <li>Contractors carrying out maintenance or monitoring;</li> <li>Visitors inspecting the Site.</li> </ul> </li> </ul>
Site Infrastructure	<ul> <li>Buildings that are semi-permanently or permanently occupied and used for work or residential purposes</li> <li>Site management systems (i.e., stormwater)</li> </ul>
Vegetation	Offsite vegetation and flora species
Fauna	• Fauna species whose habitat is within or surrounding the Site
Groundwater	<ul> <li>Groundwater that exists beneath the Site either as a local perched system or as a regional aquifer from which a water supply may be extracted for industrial or potable purposes</li> </ul>

## 6.4 Risk Analysis and Management

As outlined previously, this Risk Assessment has been undertaken to identify and evaluate the potential environmental and health risks associated with the proposed activities and to determine the risk rating of the Site. The risk assessment methodology analyses potential 'Source-Pathway-Receptor' scenarios to determine what level of risk may exist following the development works.

Where there is no complete linkage between source, pathway and receptor, there is no definitive risk of an impact occurring. Where there is a potential linkage then a risk of an impact may arise. In the absence of detailed investigations to support the Risk Assessment a risk level can only be subjectively assessed, and potential risks flagged.

## 6.5 Risk Rating Matrix

To assess the various risks, the potential hazards identified in Table 6-2 were classified according to the DWER's Guidance Statement shown in Table 6-3.



#### Table 6-3: Risk Rating Matrix

				Consequence		
		Slight	Minor	Moderate	Major	Severe
	Almost Certain	Medium	High	High	Extreme	Extreme
2	Likely	Medium	Medium	High	High	Extreme
babili	Possible	Low	Medium	Medium	High	Extreme
Pro	Unlikely	Low	Medium	Medium	Medium	High
	Rare	Low	Low	Medium	Medium	High

### 6.6 Risk Profile

Risk management measures refers to the key management strategies that will be adopted onsite to ensure that all hazards and potential risks identified are controlled to an appropriate level, and that strategies are in place to react to any potential incidents or accidents. In most cases these risk management measures decrease the probability and/or consequence of identified hazards and therefore lower the risk rating.

The current risk rating and revised probability and consequence for each identified hazard following the implementation of defined management measures are shown in Table 6-4.

Environmental Assessment and Management Plan Wastewater Treatment Plant BBB Remote Services Table 6-4: Residual Risk Profile



ble 6-4: Resid	ual Risk Profile									
Source	Receptor	Pathway	Risk	Probability	Consequence	Risk Rating	Management Measures	Revised Probability	Revised Consequence	Residual Risk Rating
	Site Infrastructure	Surface	Excessive stormwater that is not properly managed can lead to flooding onsite resulting in damage.	Possible	Moderate	Medium	<ul> <li>The WWTP will be surrounded by adequate containment infrastructure;</li> <li>The final levels around the Site's WWTP</li> </ul>	Rare	Minor	Low
& Liquid Waste	Groundwater, Vegetation and Flora	Surface	Stormwater interacting with waste may generate additional liquid waste, potentially contaminating the surrounding environment. Liquid waste can contaminate groundwater and impact native fauna and flora if released into the environment.	Possible	Moderate	High	<ul> <li>system ensure that stormwater run-off flows away;</li> <li>All stormwater engineering features will be inspected regularly, and maintenance works scheduled appropriately; and</li> <li>Monitoring of meteorological conditions (i.e., storm events).</li> </ul>	Rare	Minor	Low
	Site Users	Air		Likely	Minor	Medium	<ul> <li>Any desludging operations will be limited to a brief period on a regular, scheduled basis;</li> <li>The WWTP will undergo regular monitoring and maintenance to ensure optimal operation, especially during anaerobic</li> </ul>	Unlikely	Slight	Low
Odour	Surrounding land users	Air	Odour from liquid waste can cause amenity issues.	Likely	Minor	Medium	<ul> <li>conditions;</li> <li>A stakeholder engagement log (i.e., complaints register) will be maintained to ensure that the community can express their comments or concerns; and</li> <li>Odour levels across the WWTP will be monitored by staff.</li> </ul>	Unlikely	Slight	Low
Dust	Site Users	Air	Visibility may be impaired, and inhalation of dust may occur during site activities.	Possible	Minor	Medium	<ul> <li>Vehicles must maintain a maximum speed of 20 km/hr unless otherwise posted;</li> <li>A water cart will be utilised on unsealed roads, stockpiles and other operations as</li> </ul>	Unlikely	Slight	Low
	Surrounding vegetation	Air	Excessive dust may cause detrimental impacts to surrounding vegetation.	Possible	Slight	Medium	<ul> <li>deemed necessary during construction works, and</li> <li>All works will cease during periods of strong winds.</li> </ul>	Unlikely	Slight	Low
Noise	Site Users	Air	Noise impacts from activities onsite.	Possible	Minor	Medium	<ul> <li>All equipment and machinery will be maintained in good working condition; and</li> <li>Ensuring all vehicles accessing the Site use the designated access roadways;</li> <li>The operation of equipment and machinery during construction will be restricted to operational hours only;</li> <li>If required, plant and equipment shall be</li> </ul>	Possible	Slight	Low
	Surrounding Land Users	Air	Noise impacts from activities onsite.	Unlikely	Minor	Medium	fitted with appropriate acoustic treatment (i.e., silencers); and	Rare	Slight	Low

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consultants	Residual Risk Rating		Low	Low	Low	Low	Low
	Revised Consequence		Minor	Minor	Minor	Minor	Minor
	Revised Probability		Rare	Rare	Rare	Rare	Rare
	Management Measures	<ul> <li>Vehicles will be restricted to a maximum speed of 20km/hr at the Site.</li> </ul>	<ul> <li>Fire breaks will be established and maintained between the Site boundary and surrounding areas.</li> <li>Smoking will be restricted on Site.</li> <li>All equipment, plant, vehicles, and</li> </ul>	<ul> <li>machinery will be regularly maintained.</li> <li>Pre-start checks will be conducted on all vehicles and machinery.</li> <li>Eithe suppression antimened will undergo</li> </ul>	<ul> <li>Fire suppression equipment will under go regular testing.</li> <li>Staff will receive induction and training on fire risks, mitigation measures, and response capability.</li> </ul>	<ul> <li>Appropriate signage will be located throughout the Site and entrance/exit;</li> <li>Vehicles and machinery will move through the Site via established roads and tracks only;</li> <li>Employees and contractors shall wear high visibility and reflective clothing when working in areas where vehicle movement occurs;</li> <li>Vehicles will be restricted to a maximum speed of 20km/hr;</li> <li>All Site vehicles and machinery will undergo regular maintenance; and</li> <li>Induction will be provided.</li> </ul>	<ul> <li>Appropriate signage will be installed at the Site entrance and surrounding the WWTP;</li> <li>A perimeter fence will be installed around the Site and will be monitored and maintained;</li> <li>A perimeter fence will be installed around the WWTP and will be monitored and maintained; and</li> <li>All access gates and buildings will be locked securely outside of operational hours.</li> </ul>
	Risk Rating		Medium	High	Medium	Medium	Medium
	Consequence		Major	Major	Moderate	Major	Minor
	Probability		Rare	Possible	Possible	Unlikely	Unlikely
	Risk			Risk of fires onsite arising from faulty equipment/machinery, bushfires		Poor design of traffic flow and operations can lead to unpredictable traffic routes and create safety hazards for Site personnel.	Unauthorised personnel may access the Site resulting in a security breach of the Site facilities, plant, and equipment.
	Pathway		Surface	Surface	Surface	Surface	Surface
vices	Receptor		Site Users	Site Infrastructure	Vegetation/ Flora	Site Users	Site Infrastructure
BBB Remote Sen	Source			Fire		Traffic	Security

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## 6.7 Assessment Conclusion

The Residual Risk Assessment identified the current sources of hazards as well as possible sources of hazards arising from the proposed works. The risk rating prior to the implementation of management measures ranged from 'Low' to 'High'. The revised risk ratings were all downgraded to 'Low' once management measures were applied. Given the proposed management measures, BBBRSS will ensure that potential health, environment, and amenity impacts are avoided or minimised.



## 7 Conclusion

BBBRS is seeking to obtain the required approvals to develop a WWTP to support workers accommodation village in Hyden, WA. The key potential environmental impacts associated with the improvements of the WWTP at the Site include stormwater & liquid waste, odour, dust, noise, fire, traffic, and security. Following an evaluation of the potential environmental impacts, a suite of engineering and operational management measures has been developed and will be implemented to manage the proposed activities at the Site, which are generally considered to be low-risk due to the system's containerised designs, low wastewater acceptance volumes and the Site's environmental and social context.

As shown within the EAMP, the overall low risk of the Site, combined with the proposed environmental management measures result in low residual risk ratings. Therefore, BBBRSS believes that the construction and operation of the proposed infrastructure at the Site can be achieved while managing environmental impacts to acceptable levels.



# APPENDIX A Figures

Figure 1: Site Locality

- Figure 2: Zoning
- Figure 3: Sensitive Receptors
- Figure 4: Topography and Geology
- Figure 5: Hydrology
- Figure 6: Flora and Fauna
- Figure 7: Bushfire Prone Areas
- Figure 8: Heritage



# APPENDIX B Drawings

Site Layout: CAM-APAC-BBB-00011-20250328-S07

CONFIDENTIAL - SBR System Design: STD-SBR-M-100 Issue 0(3)

CONFIDENTIAL - Polishing Plant Design: R1088-M201 Issue A



# **APPENDIX C** Geotechnical Report

CONFIDENTIAL - WAE240126-01 001 R RevA Geotech Study



# **APPENDIX D** Site and Soil Evaluation

CONFIDENTIAL - WAE240126-01 002 R Rev0 Site & Soil



# **APPENDIX E** Environmental Report

CONFIDENTIAL - Baseline Environmental Site Investigation



# **APPENDIX F** Heritage Survey



# **APPENDIX G** KRWF Accommodation Construction Management



# **APPENDIX H**

# SBR Wastewater Treatment Plan - Control Philosophy



# **APPENDIX I** Installation, Operation & Maintenance Manuals

CONFIDENTIAL - SBR Wastewater Treatment Plan - Installation, Operation & Maintenance Manual

CONFIDENTIAL - Polishing Filtration Plant - Installation, Operation & Maintenance Manual



# APPENDIX J Schedules



# **APPENDIX K** Daily Log Sheet



# **APPENDIX L** DoH Communications



# **APPENDIX M** Flora and Fauna Survey



#### Assets | Engineering | Environment | Noise | Spatial | Waste

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