



Application for Works Approval

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

Works Approval Number W6971/2024/1

Applicant Big Bell Gold Operations

ACN 090 642 809

File number DER2024/000466

Premises Meekatharra Gold Operations
MEEKATHARRA WA 6642

Mining tenements:

G51/9, L51/18, L20/75, L51/51, L51/78, L51/79, M20/12, M20/45, M20/68, M20/70, M20/71, M20/73, M20/77, M20/107, M20/214, M20/219, M20/249, M20/421, M51/6, M51/12, M51/31, M51/33, M51/35, M51/39, M51/53, M51/62, M51/75, M51/92, M51/96, M51/132, M51/190, M51/199, M51/200, M51/203, M51/209, M51/211, M51/233, M51/236, M51/237, M51/254, M51/320, M51/321, M51/374, M51/393, M51/437, M51/438, M51/439, M51/440, M51/459, M51/483, M51/485, M51/486, M51/491, M51/492, M51/493, M51/494, M51/495, M51/504, M51/523, M51/524, M51/539, M51/569, M51/572, M51/575, M51/581, M51/654, M51/668, M51/669, M51/670, M51/671, M51/672, M51/757, M51/762, M51/784, M51/788, M51/793, M51/794, M51/795, M51/819, M51/820, M51/824, M51/834

As defined by the premises maps attached to the issued works approval

Date of report 24/12/2024

Proposed Decision Works approval granted

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1. Decision summary

This decision report documents the assessment of potential risks to the environment and public health from emissions and discharges during the construction, commissioning, and time-limited operation of the premises. As a result of this assessment, works approval W6971/2024/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

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

2.2 Application summary and overview of premises

On 27 August 2024, the applicant submitted an application for a works approval to the department under section 54 of the *Environmental Protection Act 1986* (EP Act).

The application is for the construction, commissioning, and time-limited operation of the Great Northern Highway In-Pit Tailings Storage Facility (GNHIPTSF) and the Bluebird Paste Plant within the premises. In addition, the scope includes the installation of two new groundwater monitoring bores, namely GNHMB1 and GNHMB2, located approximately south-west of GNHIPTSF. The premises is approximately 12 kilometres (km) south of Meekatharra.

The premises relates to the category 5 and assessed production capacity under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations) which are defined in works approval W6971/2024/1. The category 5 production capacity is 2,950,000 tonnes per annual period. The infrastructure and equipment relating to the premises category and any associated activities which the department has considered in line with *Guideline: Risk Assessments* (DWER 2020a) are outlined in works approval W6971/2024/1.

2.3 Other regulatory approvals

The applicant has provided the following information relating to other regulatory approvals required as outlined in Table 1.

Table 1: Other regulatory approvals and associated legislation

Legislation	Number	Approval
<i>Mining Act 1978</i>	Reg ID 117227	Most recent Yaloginda Mining Proposal (MP) and Mine Closure Plan (MCP) was approved on 24 March 2023 and included the Bluebird underground project. Applicant advised that a revised MP and MCP will be submitted in August 2024 to include the construction and operation of the GNHIPTSF to be assessed by the Department of Energy, Mines, Industry Regulation and Safety (DEMIRS).
<i>Rights in Water and Irrigation Act 1914</i>	GWL 156252(13)	Authorises a combined abstraction of up to 6,250,000 kilolitres (kL) of water annually from the production bores and pits within the premises. The applicant notes that the return water from GNHIPTSF will not be considered as part of the groundwater abstraction volume as the

Legislation	Number	Approval
		return water is in a closed recycling system.
<i>Environmental Protection Act 1986</i> (Native Vegetation Clearing)	Not applicable	The applicant has indicated that no vegetation clearing is being proposed for these prescribed activities. The proposed infrastructure for the GNHIPTSF and the paste plant are to be confined to existing cleared and disturbed areas with the premises.

3. Existing environment

3.1 Hydrogeology

The premises occurs in the Yaloginda area, where the aquifers occur typically in weathered shears, horizons, quartzose rocks in the greenstone belts and in alluvial deposits. Within the region, fractured rock aquifers can be brackish, inhomogeneous, anisotropic, and irregular in dimension. Their properties can also be influenced by the structural deformation and lithology complexity. The largest amounts of water are generated at the base of the weathering profile in the lower saprolite and saprock. Rockwater (1994) notes that the regional water table is broadly consistent with topography. The regional groundwater flows south towards Lake Annean, which is located approximately 20 km from the prescribed activities.

Rockwater (1994) notes that across the different mine areas, variation is evident in the thickness of the weathering profiles, with the saprolite zone ranging from a few metres to more than 80 m. Groundwater flows towards the main mineralisation shear zones via crosscutting vertical dykes and faults. There is low groundwater storage in the fractured rock aquifers from throughflow from the regional aquifer systems and inflows from interception of recharge.

The superficial alluvium and colluvium deposit up to 20 metres (m) thick occurs in and around the drainage lines of which local groundwater is situated in. Groundwater recharge is episodic, through direct infiltration from significant rainfall events.

Rockwater (2015) has indicated that GNHIPTSF's main aquifers are created from disconnected mineralised zones of ferruginous quartz-carbonate altered rocks. This is similar to that of the nearby Bluebird East In-pit TSF (BEIPTSF) and Bassetts West In-pit TSF (BWIPTSF), which have also been used for tailings storage.

3.2 Hydrology

3.2.1 Groundwater

Rockwater (2024) has indicated that the water levels in bores within the Yaloginda area, recorded in the department's Water Info Reporting (WIR) database, shows that pre-mining groundwater levels and flow. These levels flowed to the south-east from a mound centred on the ridge west of Bluebird, then flows southward along a drainage line to Lake Annean. Groundwater depth of the regional water table ranges from approximately 5 to 45 metres below ground level (mbgl).

3.2.2 Surface Water

Nearby surface water includes drainage lines that are approximately 1.4 km southwest and approximately 2.1 km east of the GNHIPTSF (Figure 1). It should be noted beneficial users of surface water does not occur near the GNHIPTSF. The applicant has indicated that nearby pastoral leases support cattle, that rely only on groundwater obtained via bores and wells that are not near the GNHIPTSF.

Rockwater's 2019 *Yaloginda Surface Water Assessment* identified peak flood levels and potential impacts to the Bluebird mining area. The primary drainage pathways are the north and west branches of 12 Mile Creek, flowing southward into Lake Annean. The applicant has indicated that the GNHIPTSF should not impact the existing mine site hydrology nor the downstream surface water flows. The applicant has advised that a continuous safety bund should prevent surface water runoff from entering the pit.

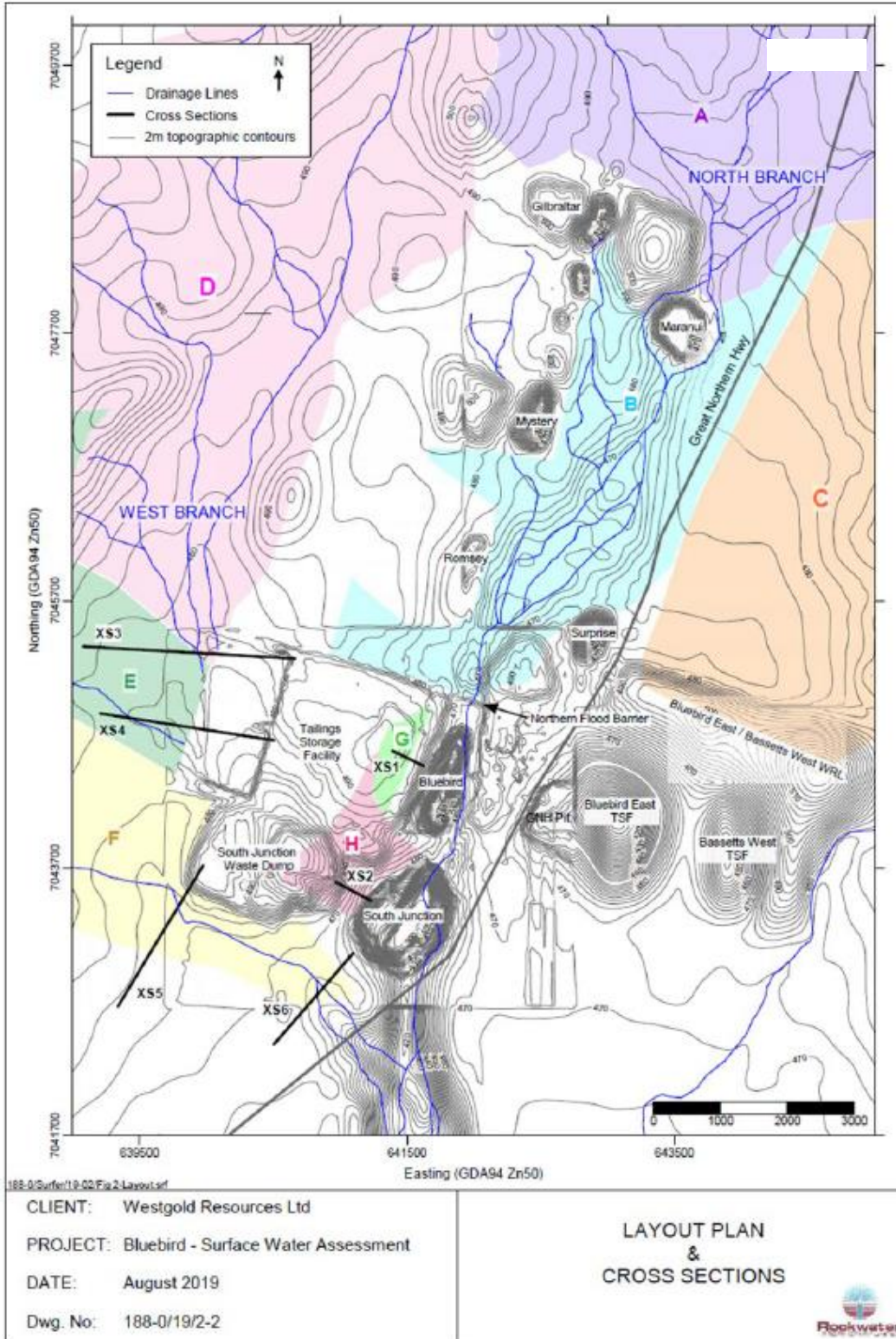


Figure 1: Surface water characteristics within the premises

4. Infrastructure – construction, commissioning, and time-limited operation

4.1 Great Northern Highway In-Pit Tailings Storage Facility

The applicant proposes to construct a new in-pit TSF by using the existing Great Northern Highway pit, to be used for continued tailings deposition as shown in Figure 2. Also utilise the existing disturbed areas and allow for the pit void to be filled, rather than remain open. The GNHIPTSF is estimated to provide a storage capacity of 1.22 million tonnes (Mt) of tailings, based on a tailings dry density of approximately 1.4 tonnes per cubic metre (t/m³).

Tetra Tech Coffey (Coffey) (2024) prepared the GNHIPTSF design where the IPTSF will be constructed in stages, with tailings initially deposited to form a beach against the west wall adjacent to the Great Northern Highway. The applicant has indicated that geotechnical assessment on the west wall of the GNH pit has shown that tailings deposition will improve the wall stability. Coffey (2024) undertook a geotechnical assessment primarily to look at the impact of tailings deposition on the stability of the GNH pit wall. Slope stability analysis, stability assessment, hydrogeological assessment, and water balance analysis have been performed to support the design of the GNHIPTSF (Coffey 2024).

It should be noted that BEIPTSF located adjacent to GNHIPTSF will both operate independently until the tailings are filled to the saddle between these pits. The combined TSFs will then operate as a large TSF with a significantly increased capacity. It is proposed to fill the GNHIPTSF to a height of 429.0 metres of Australian Height Datum (mAHD) that is the level of the saddle with BEIPTSF. The combined TSFs will have a combined maximum height of 464.5 mAHD that is 5 m below the pit crest. GNHIPTSF and BEIPTSF will have a capacity of 17 million cubic metres (Mm³), which should provide a tailings storage capacity of 9 to 15 years, adequate for the remaining mine life of the Bluebird Operations.

Currently, the licence approves tailings deposition within the BEIPTSF up to the saddle's height. The applicant has stated *'this approach offers several advantages, including:*

- *Reduced need for additional land disturbance.*
- *Improved water recovery compared to traditional above-ground storage.*
- *Lower construction costs than building a new, above-ground facility.*
- *Reduced operational and closure risks compared to above-ground options."*

A minimum operational pit wall freeboard of 0.5 m will be maintained to sustain capacity following a 1 in 100-year 72-hour rainfall event. A minimum total freeboard of 2.0 m will be maintained (including a stormwater depth of 1.5 m). The primary ingress of water into the GNHIPTSF will be from tailings deposition, that is the supernatant water and incident rainfall. Maintaining an adequate freeboard will require effective operational controls and continuous removal of water. The tailings surface permits for temporary stormwater storage above the normal operating pond level, which will be maintained at the maximum height of 464.5 mAHD.

Tailings deposition will occur via a large diameter high density polyethylene (HDPE) pipeline from the Processing Plant, connected by a spur line to the main pipeline to the GNHIPTSF. The pipeline at the discharge point will extend to a minimum of 5 m over the pit. Containment bunds will be installed and constructed along the sides of the pipeline corridor with a minimum height of 0.5 m. This will sufficiently contain any potential leaks or spills in the event of an infrastructure failure. The bunds will be constructed with suitable mine waste with no moisture conditioning and testing required for the fill materials. To facilitate the construction of the corridors around the GNHIPTSF, minor clearing of isolated vegetation is required. The access road / track will also be constructed with traffic compacted suitable mine waste with a nominal thickness of 0.3 m.

The spigot location will be below the top half of the slope, where weathering grade is the highest and the slope is closest to the highway. Monitoring of the spigot location will be undertaken to observe the level of erosion and determine whether the spigot operation should cease and be relocated to avoid excessive erosion. Tailings pipelines will be flushed with return water when deposition is halted to prevent pipe blockages. Pipelines will be contained within bunds to prevent potential spills and leaks.

The decant pump will be stationed on a mobile trailer, deployed from the pit central ramp from the northern pit wall. The return water will be pumped back to the Processing Plant for reuse. The decant pump will then be moved up the ramp as tailings and water levels rise.

Commissioning activities will involve the following:

- testing of the pipelines and spigot/s for operational functionality;
- testing the operational use of the decant pump; and
- testing the operational use of telemetry for any potential faults.

The potential emissions and discharges from the proposed prescribed activities, pathway and the applicant controls are detailed in section 6.1.1 under Table 6 of this decision report.

4.1.1 Tailings characteristics

The applicant has undertaken a chemical analysis of the current tailings process water at the Bluebird Processing Plant. The main characteristics of the process water quality was an alkaline pH, high heavy metal content, and brackish total dissolved solids (TDS). The applicant has advised that the water quality results are typical for a tailings analysis and similar results are to be acquired for the GNHIPTSF. Table 2 provides a detailed chemical analysis of the process water quality analysed on 23 April 2024.

Table 2: Tailings process water quality results

Parameter	Units	Laboratory Result	Parameter	Units	Laboratory Result
pH	pH	9.6	Cadmium	mg/L	0.0021
Conductivity at 25°C	µS/cm	15000	Chromium		<0.02
TDS	mg/L	9700	Cobalt		2.0
Chloride		4200	Copper		27
Sulfate		1900	Iron		15
Hexavalent Chromium		<0.01	Lead		<0.02
Calcium		740	Manganese		<0.02
Magnesium		6.1	Nickel		52
Sodium		2400	Selenium		0.058
Potassium		120	Thallium		<0.02
Hardness		1900	Zinc		1.7
Arsenic		2.2	Mercury		0.22
Antimony		2.3	Total Cyanide		100
Boron		0.61	WAD Cyanide		100

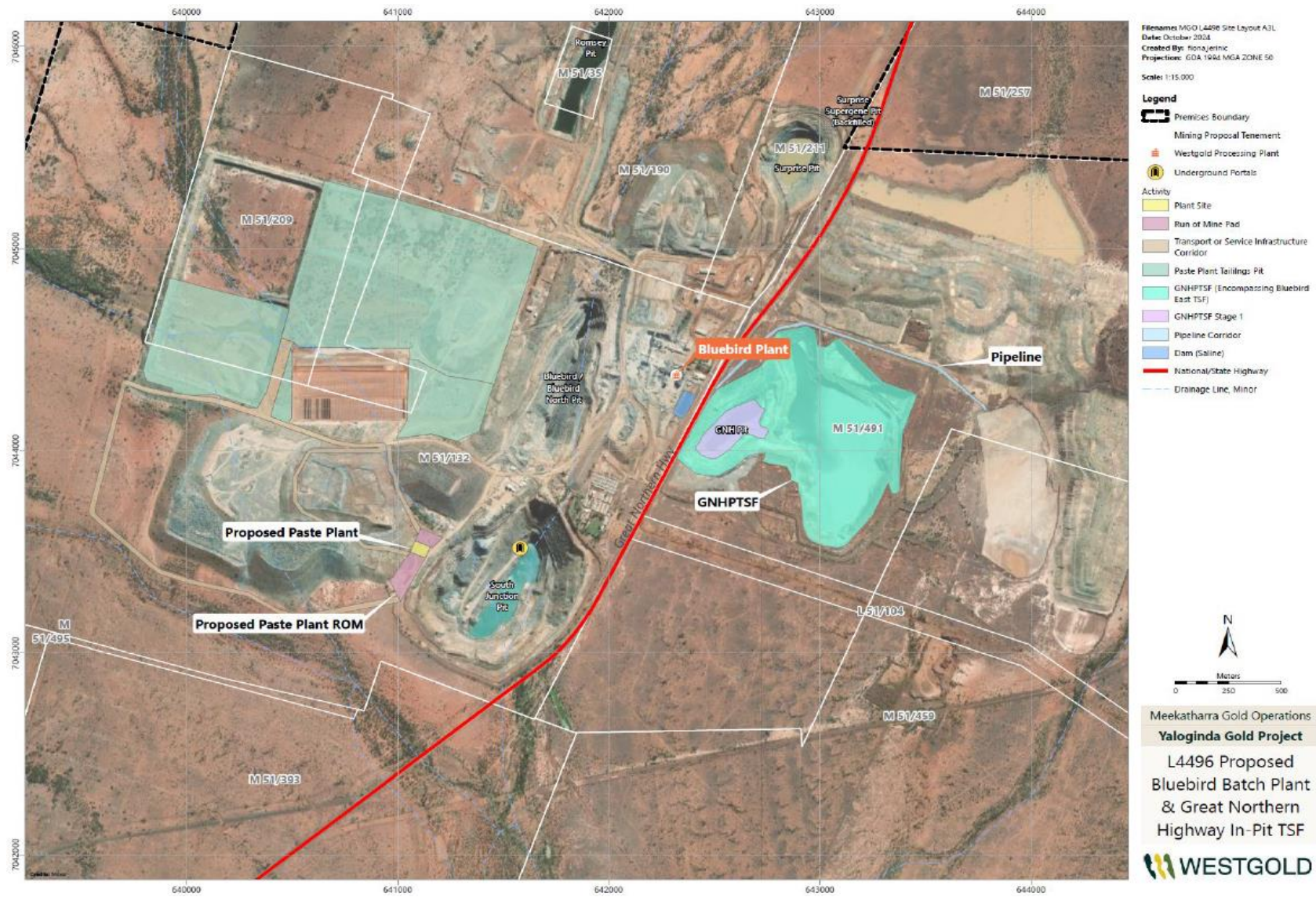


Figure 2: Proposed GNHIPTSF and Bluebird Paste Plant

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IR-T13 Decision report template (short) v3.0 (May 2021)

Tailings physical characterisation

The following is a summary of the geotechnical investigation the applicant commissioned Coffey (2016) on the tailings that will be deposited in GNHIPTSF. Further information has been summarised from the CMW Geosciences (CMW) 2023 *Annual Audit and Management Review* report:

- Tailings slurry density of 40 % solids.
- Tailings dry density for BEIPTSF in 2016 was 1.36 t/m³, and in 2023 the reconciled dry density is 1.4 t/m³.
- Material described as Sandy silt.
- Particle size distribution (PSD) of 75 % passing the 75 µm and 6 % passing the 1 µm.
- Relatively good consolidation characteristics, Cv of 12 to 60 square metres per year (m²/yr).

Ore and tailings geochemical characterisation

Metals X Group (Metals X) (2015) undertook an assessment on the geochemical characteristics on the ore and tailings to be used to assess the potential long-term adverse environmental effects associated with BWIPTSF. This geochemical assessment was also used to optimise the design and subsequent management to minimise impacts to the surrounding environment. It should be noted that the TSF Design Report for GNHIPTSF (Coffey 2024) had indicated that the tailings test work undertaken for BWIPTSF was used for BEIPTSF and that the tailings deposited into GNHIPTSF is anticipated to have the same physical properties as the tailings deposited into the existing TSFs. Coffey (2024) has thus utilised the previous Metal X (2015) ore and tailings characterisation results to be adopted for the GNHIPTSF design.

The primary focus of the tailings test work was to identify the tailings potential for acid mine drainage (AMD) generation and associated metal leaching. This was determined by using acid-base accounting, sulphur and carbon geochemistry, and net acid generation (NAG) testing.

The following is a summary of the ore and tailings geochemical characterisation and mineralogy that will be deposited into GNHIPTSF:

Tailings:

- Neutral to alkaline;
- Low to medium contents of soluble salts;
- Total sulphur values ranged from 0.01 to 0.77 with a median value of 0.16. 40 % of tails had a total sulphur <0.005 %;
- 11 of the tailing samples had a high acid consuming properties;
- Majority of samples have sufficient buffering capacity;
- Under the strongly-oxidising conditions of the NAG-test work, the tailings samples did not acidify. 64 % of the Bassetts West tailings samples were acid forming and 24 % of the samples were non-acid forming (NAF). 100 % of the Bluebird tailings samples were acid consuming;
- Tailings is classified as NAF. Tailings contains only trace amounts of sulphide minerals and have a high capacity to consume acid;
- Tailings show a significant enrichment in Arsenic, Antimony, Tellurium, Chromium and Nickel, and a minor enrichment in Copper, Cobalt, Bismuth, Magnesium, and Selenium;
- Leached tailings exceed Chromium limits when compared to ANZECC 2000 livestock drinking water values, licence L4496/1988/11 limits, and the Department of Health (DoH)

non-potable groundwater use limits. Nickel and Iron exceed the DoH limits, whilst Lead and Aluminium exceed the ANZECC 2000 livestock drinking water values and DoH limits;

- Tailings mineralogy is 20 to 50 % quartz, plagioclase, and albite; and
- Process tailings stream produced during premise’s operations is geochemically benign.

Ore:

- Mildly acidic to alkaline;
- Low to medium contents of soluble salts;
- Comprise of negligible to medium amounts of sulphide minerals. 20 % of ore samples had total sulphur results below the laboratory detection limit (<0.005);
- Acid Neutralising Capacity (ANC) values ranging from 1.0 to 340 kilograms of sulfuric acid per tonne (kg H₂SO₄/t) with a median value of 99 kg H₂SO₄/t;
- Acid produced by ore through pyrite oxidation will react with other minerals in the material and can be neutralised;
- 36 % of the ore samples had high acid consuming properties;
- Majority of samples have sufficient buffering capacity;
- Under strongly-oxidising conditions of the NAG-test work, about 7 % of the ore samples did acidify strongly, 82 % did not acidify, and 11 % of the ore samples gave uncertain results;
- Ore material from Yaloginda, Paddy’s Flat, Reedy, Big Bell, Day Dawn, and Cuddingwarra is:
 - significantly enriched with Sulphur, Tellurium, Arsenic, Copper, Sb, Silver, Chromium, Nickel, Tungsten, Cadmium, Selenium, Bismuth, Lead and Boron; and
 - slightly enriched in Cobalt, Zinc, Scandium, Aluminium, Magnesium, Molybdenum, Mercury, Thallium and Iron;
- Leach testing results indicates the ore exceeds the Aluminium ANZECC 2000 livestock drinking water and DoH limits and Iron and Manganese exceed the DoH limits;
- Mineralogical data generally confirms the Acid Base Accounting (ABA) data in terms of carbonate mineral content;
- Majority of ores produced during the premise’s operations are geochemically benign.

4.1.2 Groundwater quality

The applicant has conducted a chemical analysis of the local groundwater quality at the GNHIPTSF. The main characteristics of the groundwater quality was alkaline pH, TDS classified as weakly saline, sodium chloride type, high nitrate concentrations, and low metal concentrations. Table 3 provides a detailed chemical analysis of the groundwater from the GNHIPTSF that was undertaken on 10 January 2024.

Table 3: Groundwater quality results from the GNHIPTSF

Parameter	Units	Laboratory Result	Parameter	Units	Laboratory Result
pH	pH	8.5	Hardness	mg/L	2600

Parameter	Units	Laboratory Result	Parameter	Units	Laboratory Result
Conductivity at 25°C	µS/cm	7300	Aluminium		<0.005
Chloride	mg/L	2000	Arsenic		0.34
Sulfate		920	Cadmium		<0.0001
Calcium		230	Chromium		0.006
Magnesium		490	Copper		<0.001
Fluoride		0.2	Nickel		0.004
Nitrite Nitrogen, NO ₂ as N		<0.05	Lead		<0.001
Nitrate Nitrogen, NO ₃ as N		0.89	Zinc		<0.005
Sodium		750	Mercury		<0.00005
Potassium		38	Selenium		0.021
Silicon		20	Total Cyanide		<0.004
TDS		4800	WAD Cyanide		<0.004

Under active licence L4496/1988/11, standing water level (SWL) and groundwater quality monitoring is undertaken at the nearby BEIPTSF monitoring bores, BEMB1, BEMB2, BEMB3 and BEMB4. Table 4 presents the BEIPTSF monitoring bore groundwater quality results over the time period from 2016 to 2024. The applicant has undertaken the Mann-Kendall test to determine the monotonic trend for non-parametric data. For some parameters a trend was not able to be determined. The applicant has provided the long-term SWL data for BEIPTSF monitoring bores as shown in Figure 3.

The monitoring results overall show low cyanide and metal concentrations, circum-neutral pH, and salinities within the range of pre-mining groundwater. Rockwater (2024) has suggested that the minimal impacts from BEIPTSF may be due to low groundwater levels in the bores that implies flow of water is from the groundwater into the pit, as opposed to the pit to the surrounding groundwater.

Table 4: Bluebird East TSF monitoring bore groundwater quality

Parameter	Unit	Bore	Mean	Minimum	Maximum	Mann-Kendall	
						Statistic	Trend
pH	pH	BEMB1	7.86	7.18	8.4	76	Probably Increasing (91.79%)
		BEMB2	7.80	7.14	8.3	47	No Trend (85.67%)
		BEMB3	7.90	7.18	8.2	-51	Probably Decreasing (94.09%)
		BEMB4	8.05	7.43	8.40	-44	Probably Decreasing (91.73%)
TDS	mg/L	BEMB1	1108.08	780	4100	9	No Trend (59.04%)
		BEMB2	1140.17	1000	1500	-1	No Trend (50.00%)
		BEMB3	913.24	840	1500	-33	Probably Decreasing (93.82%)
		BEMB4	1521.34	1300.00	4000.00	-53	Decreasing (96.76%)
Arsenic	mg/L	BEMB1	0.01	0.008	0.045	-459	Decreasing (100.00%)
		BEMB2	0.01	0.001	0.061	78	Probably Increasing (91.90%)
		BEMB3	0.00	0.001	0.004	-30	Stable (67.62%)
		BEMB4	0.01	0.00	0.05	-269	Decreasing (100.00%)
Cadmium	mg/L	BEMB1	0.00	0.0001	0.002	N/a	Unable to be determined
		BEMB2	0.00	0.0001	0.002	N/a	

Parameter	Unit	Bore	Mean	Minimum	Maximum	Mann-Kendall	
						Statistic	Trend
		BEMB3	0.00	0.0001	0.002	N/a	
		BEMB4	0.00	0.00	0.00	N/a	
Chromium	mg/L	BEMB1	0.05	0.02	0.34	-33	Probably Decreasing (93.82%)
		BEMB2	0.22	0.01	0.42	-29	Probably Decreasing (94.71%)
		BEMB3	0.16	0.087	0.2	-33	Probably Decreasing (93.82%)
		BEMB4	0.00	0.00	0.04	-32	Probably Decreasing (93.76%)
Copper	mg/L	BEMB1	0.00	0.001	0.01	N/a	Unable to be determined
		BEMB2	0.00	0.001	0.036	N/a	
		BEMB3	0.00	0.001	0.01	N/a	
		BEMB4	0.00	0.00	0.01	N/a	
Lead	mg/L	BEMB1	0.00	0.001	0.01	33	No Trend (73.71%)
		BEMB2	0.00	0.001	0.03	76	Probably Increasing (93.56%)
		BEMB3	0.00	0.001	0.01	-19	No Trend (67.43%)
		BEMB4	0.13	0.00	4.60	87	Increasing (96.93%)
Mercury	mg/L	BEMB1	0.00	0.00005	0.0005	N/a	Unable to be determined
		BEMB2	0.00	0.00005	0.0002	N/a	
		BEMB3	0.00	0.00005	0.0004	N/a	
		BEMB4	0.00	0.00	0.00	N/a	
Nickel	mg/L	BEMB1	0.01	0.001	0.039	-3	Stable (51.68%)
		BEMB2	0.03	0.001	0.39	48	No Trend (84.26%)
		BEMB3	0.00	0.001	0.01	-64	Decreasing (98.52%)
		BEMB4	0.00	0.00	0.01	-61	Decreasing (98.34%)
Selenium	mg/L	BEMB1	0.00	0.001	0.006	N/a	Unable to be determined
		BEMB2	0.00	0.001	0.006	N/a	
		BEMB3	0.00	0.001	0.004	N/a	
		BEMB4	0.00	0.00	0.01	N/a	
Zinc	mg/L	BEMB1	0.01	0.005	0.053	-64	Decreasing (96.41%)
		BEMB2	0.01	0.005	0.032	-57	Decreasing (99.00%)
		BEMB3	0.01	0.005	0.064	-92	Decreasing (99.53%)
		BEMB4	0.01	0.01	0.02	-63	Decreasing (98.62%)
WAD Cyanide	mg/L	BEMB1	0.00	0.004	0.015	389	Increasing (100.00%)
		BEMB2	0.01	0.004	0.038	88	Probably Increasing (94.03%)
		BEMB3	0.00	0.004	0.005	9	No Trend (54.40%)
		BEMB4	0.00	0.00	0.01	-118	Decreasing (99.70%)

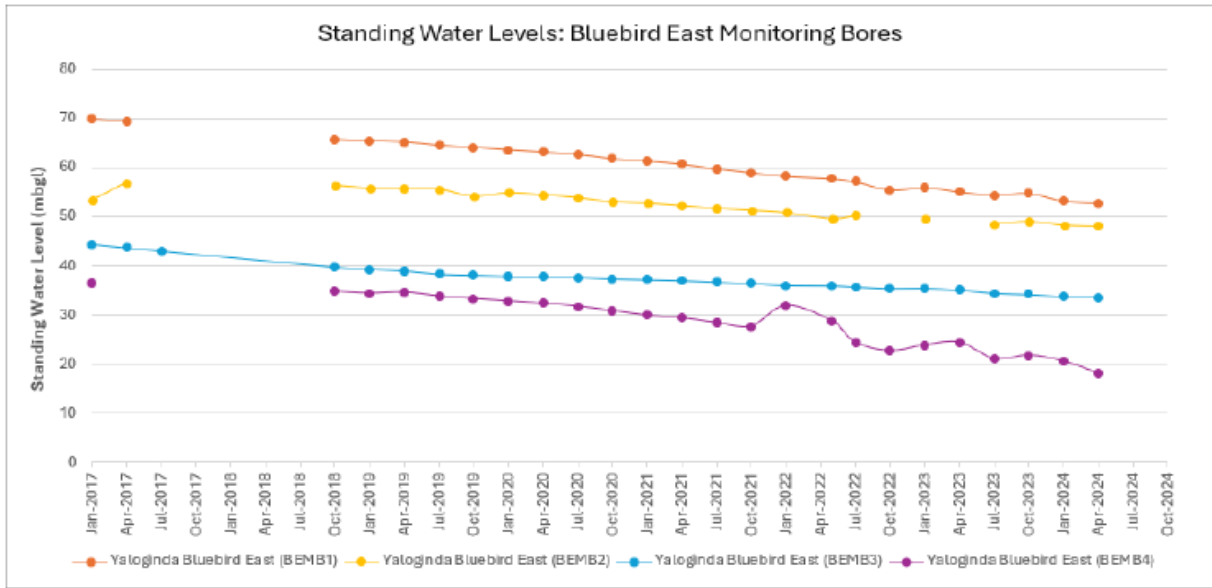


Figure 3: Bluebird East TSF Standing Water Level

4.1.3 Water recovery and seepage

As the GNHIPTSF is an existing in-pit, the GNHIPTSF design does not require the installation of seepage control measure that would be implemented for other TSF designs, for example an underdrainage system. No underdrainage system is proposed as there is a vast amount of groundwater in the pit and it is not practical to remove the groundwater prior to commissioning. A decant return line is proposed to be installed to recover approximately 76.7 % of supernatant using a decant pump deployed along the existing access ramp that separates GNHIPTSF and BEIPTSF. The recovered supernatant water will be pumped back to the processing plant for reuse (Coffey 2024).

Coffey (2024) has indicated that management of the tailings deposition and supernatant water pond will ensure that the pond is positioned next to the pit access ramp and the opposite side of the pit from the discharge point. The supernatant water pond will move up the pit access ramp, as the deposition of tailings and water levels start to rise. The decant pump will be retreated up the ramp and the ramp will also provide access for pump operation and maintenance requirements.

Rockwater (2024) has indicated that there is a potential for minimal seepage into nearby groundwater, if the tailings level exceeded the pre-mining groundwater that is approximately 455 m AHD. This seepage would primarily flow down hydraulic gradient to the south. The nearest sensitive receptor is the 12 Mile Well, that is located approximately 2 km south of the GNHIPTSF, however it is unknown if whether the well is currently in use. However, the proposed monitoring bores to be installed will assist in monitoring groundwater levels and quality near this well for potential impacts.

4.1.4 Water balance

A water balance analysis was undertaken by CMW (2024) where inflows and outflows for the facility was estimated monthly and under average climatic conditions. Average climate statistics for Meekatharra were used in the analysis. The inflows included rainfall and slurry water, whilst outflows included seepage losses, water retained in the tailings (pore pressure), and evaporation. The following parameters / assumptions were used as part of the analysis as listed in CMW (2024):

- Average annual rainfall – 232 mm;

- Average annual evaporation – 4068 mm;
- Slurry inputs – 250,000 tpa at an assumed average of 40 % solids;
- Runoff coefficient within the GNHIPTSF pit surface area – 1.0 (assumed);
- Runoff coefficient from the external catchment above the pit area – 0.5 (estimated);
- Evaporation pan factor of 0.65;
- Impoundment it surface area – 181, 581 square metres (m²);
- External catchment area above the pit area – 36,316 m²;
- Supernatant pond area (under normal operating conditions, based on tailings deposition modelling using the Muk3d software program) – 15 to 20 % of the tailings surface area; and
- Running beach area (based on tailings deposition modelling using the Muk3d software program) and is assumed as 50 % of the staged tailings surface area remaining wet.

The results indicated that the estimated water return would be between 70 and 75 % of supernatant water inflow, similar to other in-pit TSFs in the northern goldfields (CMW 2024). The water management would vary based on TSF management, that is, the running beaches and pond size. Water recovery can be maximized by the TSF and monitoring bores operating to guarantee that the surface water pond is as small as feasible.

The following factors will determine the amount of water quantity available for return to the processing plant:

- continuation of tailings discharge,
- variations in slurry density;
- supernatant pond and running beaches size;
- distance between the decant abstraction bores and discharge point;
- climatic conditions during operations; and
- decant system efficiency during operations.

4.1.5 Monitoring

Monitoring that has been undertaken surrounding Bluebird East and Bassetts West pits, the data collected and analysed has indicated minimal impact on groundwater. It should be noted that the monitoring data identified low Weak Acid Dissociable (WAD) cyanide levels, circum-neutral pH, low salinity and minimal metal concentrations.

The current monitoring network under the existing licence L4496/1988/11 has seven number of monitoring bores near the Process Water Pond and BEIPTSF that are near the GNHIPTSF. The three bores, PWD1, PWD2, and PWD3 surrounding Process Water Pond and one of the monitoring bores, BEMB4 for the BEIPTSF would be utilised to monitor groundwater near GNHIPTSF. The applicant has proposed to install and construct two additional monitoring bores on the southern side of the GNHIPTSF to further assess groundwater conditions. Table 5 provides the proposed monitoring bore locations.

Table 5: Proposed monitoring bore locations

Monitoring bore	GPS Coordinates	
	Easting (mE)	Northing (mN)
GNHMB1	642450	7043890
GNHMB2	642560	7043950

4.2 Bluebird Paste Plant

The applicant proposes to construct and operate a mobile paste plant within the premises on an existing disturbed and cleared area as shown in Figure 2. The Bluebird Paste Plant design is shown in Figure 4. Tailings will be obtained from the existing Bluebird North TSF cells 1 to 4 using conventional open-pit mining methods. The excavated tailings material will then be transported via a dump truck to a dedicated Run-of-Mine (ROM) pad next to the South Junction Pit.

The Paste Plant will produce a cement-tailings slurry / paste that will be injected into the Bluebird underground mine. The paste plant will be positioned above the vertical paste delivery hole to the Bluebird underground mine, where the cemented paste will be delivered underground via a 150 mm steel pipe drilled directly down to the underground workings. This slurry / paste will improve mine stability and safety. The applicant has indicated that any excess water from the placed paste will be captured by the mine dewatering system and pumped to the settling pit for recapture and reuse.

The Bluebird Paste Plant will include the following associated infrastructure:

- paste mixer and paste hopper;
- tailings feed hopper;
- binder silos / storage;
- wet binder dosing equipment;
- conveyor and compressor air arrangement;
- control room and laboratory;
- dust suppression and raw water tanks;
- access platform; and
- general piping.

The applicant sent Bluebird North TSF tailings to a laboratory for viability testing to ensure the tailings is suitable for paste fill production. The applicant has provided the following information

regarding the viability testing undertaken:

“BBGO commissioned Operational Geotech’s (OG) to complete a paste fill characterisation analysis using Bluebird TSF cells 1-4 tailings and processing water, LH cement and Minecem supplied from the Bluebird Mine. Testing included assessment of:

- *X-Ray Diffraction (XRD) to assess the mineralogical composition of the tailings for each TSF sample.*
- *Particle size distribution (PSD); for assessing the variability of tailings.*
- *Yield Stress measurements of the paste fill batches to assess rheological properties of each of the tailings from the cell.*
- *Cemented Paste Fill samples are to be batched at 3, 5 & 8 % cement concentration at a solids content targeting 250 Pa.*
- *Shear stress (and hence viscosity) of the tailings mixed with 5% w/w (dry basis) of the supplied LH cement as a function of shear rate, for a sample with a nominal shear yield stress of 250 Pa.*

Preliminary characterisation testing has shown that the Bluebird TSF cells 1-4 & Bluebird North tailings are expected to be well suited for paste backfill due to acceptable shear strength resistance and particle size distribution.”

The Paste Plant is designed to combine dry tailings with Minecem (or cement and water) to produce a slurry that meets the requirements for underground injection. The production capacity for the paste plant is approximately 1,000 m³ of slurry per shift (or 100 m³ per hour), with the total amount produced of approximately 450,000 tonnes per annum. The paste fill process will consume approximately 23,608 tonnes of paste binder annually, stored in bunded areas.

Commissioning activities involve the testing of plant components during operation, dust suppression systems, and to check for any potential leaks from plant components and pipelines.

For the operation of the paste plant, approximately an average of 100,000 kilolitres (kL) of water will be required annually, reaching a peak demand of 150,000 kL by the eighth year of operation. Water will be obtained from the existing dewatering circuit and the applicant has a groundwater licence (GWL 156252(13)) to abstract water of up to 6,250,000 kL.

The applicant has indicated that the use of the Bluebird North TSF tailings material and converted into a stabilising agent for the underground mine works, would reduce the surface footprint of the TSF and the operational life of the underground mine increased. The applicant has also indicated that there is not likely to be a significant adverse impact to the locally groundwater quality as the cemented paste will harden and act as ground support for the underground slopes and no leaching is expected to occur.

Dust will be managed through several mitigation measures including the use of water carts, use of dust suppression system, monitoring of weather conditions and visible dust, storing concrete binder and flocculant in enclosed system / container shed.

The applicant has indicated that the dry tailings storage ROM pad will be enclosed within a perimeter bund to mitigate run-off from leaving the area. Surface water infrastructure will be constructed to direct any surface water away from work areas (if required) and will include infrastructure such as collection sumps, bunding, and culverts. The proposed surface water management infrastructure will be designed for a 1 in 100-year rainfall event.

Storage and handling of hydrocarbons and paste plant reagents will be contained within bunded areas that comply with Australian Standard (AS) 1940-2004 and AS 1692-2006. The following procedure, *Hydrocarbon and Chemical Management Procedure (SOP022)* will be adhered to on site. Spill kits will be available around the Paste Plant and any spills will be contained, controlled and cleaned up promptly. Any contaminated soils will be transported to the bioremediation pad.



Figure 4: Bluebird Paste Plant Design

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5. DEMIRS environmental and geotechnical advice

Environmental and geotechnical advice was sought from DEMIRS on the construction, commissioning, and time-limited operation of GNHIPTSF and the Bluebird Paste Plant. DEMIRS advice is summarised below:

- A revised Mining Proposal (MP) Reg ID 128155 was submitted on 16 September 2024 to DEMIRS and is currently under assessment. The revised MP includes the proposed GNHIPTSF, the Bluebird Paste Plant, tailings stockpile Run-of-Mine pad, and tyre disposal within the South Junction Pit.
- DEMIRS requested further information from the applicant on 24 October 2024 to clarify and amend several inconsistencies across the documents relating primarily to disturbance calculation and activity areas.
- The GNHIPTSF is to be reviewed by DEMIRS' Geotechnical Inspector for comment, but the documentation for the TSF design was requested as part of the request for further information.
- DEMIRS has stated "*based on the information provided within the MP prior to reviewing design specifics, it is expected that the In-Pit TSF design will increase stability of the Great Northern Highway Pit wall. Any stability or geotechnical safety issues raised by the Geotechnical Inspector from the review will be provided to Big Bell Gold Operations for amendment of design (if required) prior to approval of the Mining Proposal and Mine Closure Plan*".

Should recommendations be made by the DEMIRS' Geotechnical Inspector after the GNHIPTSF design report is reviewed, the department should be advised and a potential works approval amendment sought (should material changes be needed and/or conditions need modifying).

It should be noted that the tyre disposal within the South Junction Pit had been discussed at the time of the application and during the validation stage. The department advised the applicant that only the new works approval is to be assessed. The tyre disposal amendment is related to licence L4496/1988/11 and the department requested that the applicant submit a separate licence amendment for that proposed change.

6. 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 2020a).

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.

6.1 Source-pathways and receptors

6.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction, commissioning, and time-limited operation which have been considered in this decision report are detailed in Table 6 below. Table 6 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Table 6: Proposed applicant control

Sources / Activities	Potential emissions	Potential pathways	Proposed controls
Construction			
<p>Construction of the GNHIPTSF and associated infrastructure</p> <p>Movement of vehicles and mobile equipment</p> <p>Construction of additional monitoring bores</p>	Dust	Air / windborne pathway	<ul style="list-style-type: none"> Monitoring of local wind speeds and pause works until conditions improve. Water truck must be used for dust suppression. Reduce vehicle movements during periods of high wind events.
<p>Construction of the Bluebird Paste Plant and associated infrastructure</p> <p>Movement of vehicles and mobile equipment</p>			
Commissioning			
Commissioning of GNHIPTSF, pipelines, and telemetry	Tailings and decant return water	Discharge to land / runoff from potential spillage / leak	<ul style="list-style-type: none"> Tailings pipelines must be equipped with secondary containment (containment trench or bund) capable of holding any potential spill until the next routine inspection. Pipelines must be equipped with leak detection system. Daily visual inspections must be undertaken to check pipeline integrity.
Commissioning of Bluebird Paste Plant and pipeline infrastructure	Paste plant slurry	Discharge to land from potential spillage / leak	<ul style="list-style-type: none"> Pipelines must be equipped with secondary containment (containment trench or bund) capable of holding any potential spill until the next routine inspection. Pipelines must be equipped with leak detection system. Daily visual inspections must be undertaken to check pipeline integrity.
Time-limited operation			
Operation of the GNHIPTSF (and combined GNHIPTSF and BEIPTSF) including the decant recovery infrastructure	Seepage of leachate including wall failure of the TSF	Infiltration through the foundation base to soils and groundwater	<ul style="list-style-type: none"> Decant return line to recover approximately 76.7 % of slurry water (supernatant) for recycling within the processing plant. Undertake ambient groundwater monitoring at the two addition

Sources / Activities	Potential emissions	Potential pathways	Proposed controls
			<ul style="list-style-type: none"> monitoring bores and in accordance with monitoring from Licence L4496/1988/11.
		Infiltration through the walls through soils and to groundwater	<ul style="list-style-type: none"> Undertake ambient groundwater monitoring at the two addition monitoring bores and in accordance with monitoring from Licence L4496/1988/11. Inspections of spigot location to detect and address any potential erosion. Ensure tailings are deposited in a manner that supports the stability of the west wall.
	Tailings	Overtopping of tailings from the TSF	<ul style="list-style-type: none"> Maintain and operate a minimum of 0.5 m freeboard between the pipeline and the top of the embankment. Daily inspections of all tailings management infrastructure must be undertaken.
Operations of tailings and return water pipelines	Tailings and decant return water	Discharge to land / runoff from potential spillage / leak	<ul style="list-style-type: none"> Maintain and operate pipelines equipped with secondary containment (bund) capable of holding any potential spill until the next routine inspection. Daily inspections of all tailings management infrastructure must be undertaken.
Loading, transport and stockpiling of tailings from Bluebird North TSF	Dust	Air / windborne pathway	<ul style="list-style-type: none"> Monitoring of local wind speeds and visual dust, pause works until conditions improve. Water truck must be used for dust suppression. Maintain and operate dust suppression systems. Reduce vehicle movements during periods of high wind events. Concrete binder must be delivered and stored within a silo and in an enclosed discharge system. Flocculant must be stored and weighed within a container shed.
Operation of the Bluebird Paste Plant and associated pipeline	Release of hydrocarbons, cement agents, production water or final	Discharge to land from potential spillage / leak	<ul style="list-style-type: none"> Maintain earthen windrows on the ROM around the Paste Plant to divert uncontaminated stormwater away from the area. Paste spills must be contained by the

Sources / Activities	Potential emissions	Potential pathways	Proposed controls
	paste product		<p>pit hardstand, abandonment bund or pit itself. The applicant notes no practical pathway for discharge to the environment.</p> <ul style="list-style-type: none"> Spill control equipment located at the Paste Plant and maintained.
	Sediment laden / contaminated stormwater	Discharge to land from potential spillage / leak	<ul style="list-style-type: none"> Maintain earthen windrows on the ROM pad around the Paste Plant to divert uncontaminated stormwater away from the area. Surface water infrastructure must be constructed where required to direct surface water away from work areas. This may include culverts, drainage lines, bunding, or collection sumps. Maintain works areas where required by grading to ensure any contaminated stormwater directed away from work areas and directed to a designated collection and reused / treated according if disposed.

6.1.2 Receptors

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

Table 7 and Figure 5 below provides a summary of potential environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises (*Guideline: Environmental Siting* (DWER 2020b)). It should be noted that any potential sensitive human receptors have been screened out from the risk assessment as the nearest human receptors are more than 5 km from the prescribed activities. In addition, some environmental receptors have been listed in the table below, to indicate surrounding sensitive receptors, but have been screened out as not being directly impacted due to the distance from the prescribed activities.

Table 7: Sensitive human and environmental receptors and distance from prescribed activity

Environmental receptors	Distance from prescribed activity
<u>Environmentally Sensitive Area</u> Lake Annean	Approximately 20 km south of the prescribed activities. Screened out due to the distance – no further assessment required.
<u>Threatened / Priority Ecological Communities (TEC/PEC)</u> P1 PEC - <i>Pollele calcrete groundwater assemblage type on Murchison palaeodrainage</i>	Approximately 16 km south of the prescribed activities. Screened out due to the distance – no further

Environmental receptors	Distance from prescribed activity
<i>on Polelle Station</i>	assessment required.
P3 PEC – <i>Trillbar Land System</i>	Approximately 10 km east of the prescribed activities. Screened out due to the distance – no further assessment required.
P3 PEC – <i>Austin Land System</i>	Approximately 20 km south of the prescribed activities. Screened out due to the distance – no further assessment required.
P3 PEC – <i>Yahagong Land System</i>	Approximately 3.5 km west of the prescribed activities. Screened out due to the distance – no further assessment required.
<u>Threatened / Priority Fauna</u> Night Parrot (<i>Pezoporus occidentalis</i>) Critically Endangered	Not recorded within 20 km of the prescribed activities. The applicant has indicated that suitable habitat consists of spinifex hummocks of which are not occurring within the premises. No further assessment required.
Malleefowl (<i>Leipoa ocellata</i>) Vulnerable	Not recorded within 20 km of the prescribed activities. The applicant has indicated that vegetation in the areas is considered too sparse and the ground cover too rocky to be considered suitable habitat for mound construction. No further assessment required.
Peregrine Falcon (<i>Falco peregrinus</i>) Other Specially Protected	Approximately 2 km north of the premises. The applicant has indicated that there isn't any suitable habitat for nesting and foraging within the premises boundary.
West Coast Mulga Slider (<i>Lerista eupoda</i>) P1	Recorded approximately 20 km south of the premises. The applicant has indicated that there is potential habitat available within the premises and surrounding area. With no vegetation clearing undertaken, the proposed prescribed activities are unlikely to impact on this species.
Long-tailed Dunnart (<i>Sminthopsis longicauda</i>) P4	Approximately 2.7 km west of the premises. The applicant has indicated suitable habitat (rocky hills) is not present within the premises.
<u>Threatened / Priority Flora</u>	The applicant has indicated that there is no

Environmental receptors	Distance from prescribed activity
<i>Santalum spicatum</i> (Sandalwood is not a priority species, but a valued export resource)	<p>proposed vegetation clearing and there will be no impacts on these species.</p> <p>Identified during the Western Ecological (2022) survey undertaken within the premises.</p>
<i>Eremophila retrophila</i> P1	
<i>Eremophila incisa</i> P1	
<i>Ptilotis luteolus</i> P3	
<u>Nearby native vegetation</u>	<p>Within the vicinity of the prescribed activities.</p> <p>Potentials from dust during the construction works.</p>
<u>Surface water</u>	<p>Nearby drainage lines, approximately 1.4 km southwest and approximately 2.1 km east of the GNHIPTSF.</p> <p>It should be noted that the <i>Yaloginda Surface Water Assessment</i> by Rockwater (2019) identified peak flood levels and potential impacts to the Bluebird mining area. Primary drainage pathways are the north and west branches of 12 Mile Creek, flowing southward in Lake Annean. The GNHIPTSF should not affect existing mine site hydrology or downstream surface water flows. A continuous safety bund should prevent surface runoff from entering the pit.</p>
Cultural receptors	Distance from prescribed activity
<p><u>Aboriginal and other heritage sites</u></p> <p>ID 11920: Norie 1 Engraving</p> <p>ID 11921: Norie 2 Artefacts / Scatter</p> <p>ID 11922: Norie 3 Artefacts / Scatter</p>	Approximately 5 km west of the prescribed activities.
ID 6212: Wadjari Men's South Artefacts / Scatter	Approximately 7 km northeast of the prescribed activities.
ID 6256: Meekatharra South Artefacts / Scatter	Approximately 8 km north of the prescribed activities.
ID 11923: Norie 4 Artefacts / Scatter	Approximately 10 km southwest of the prescribed activities.

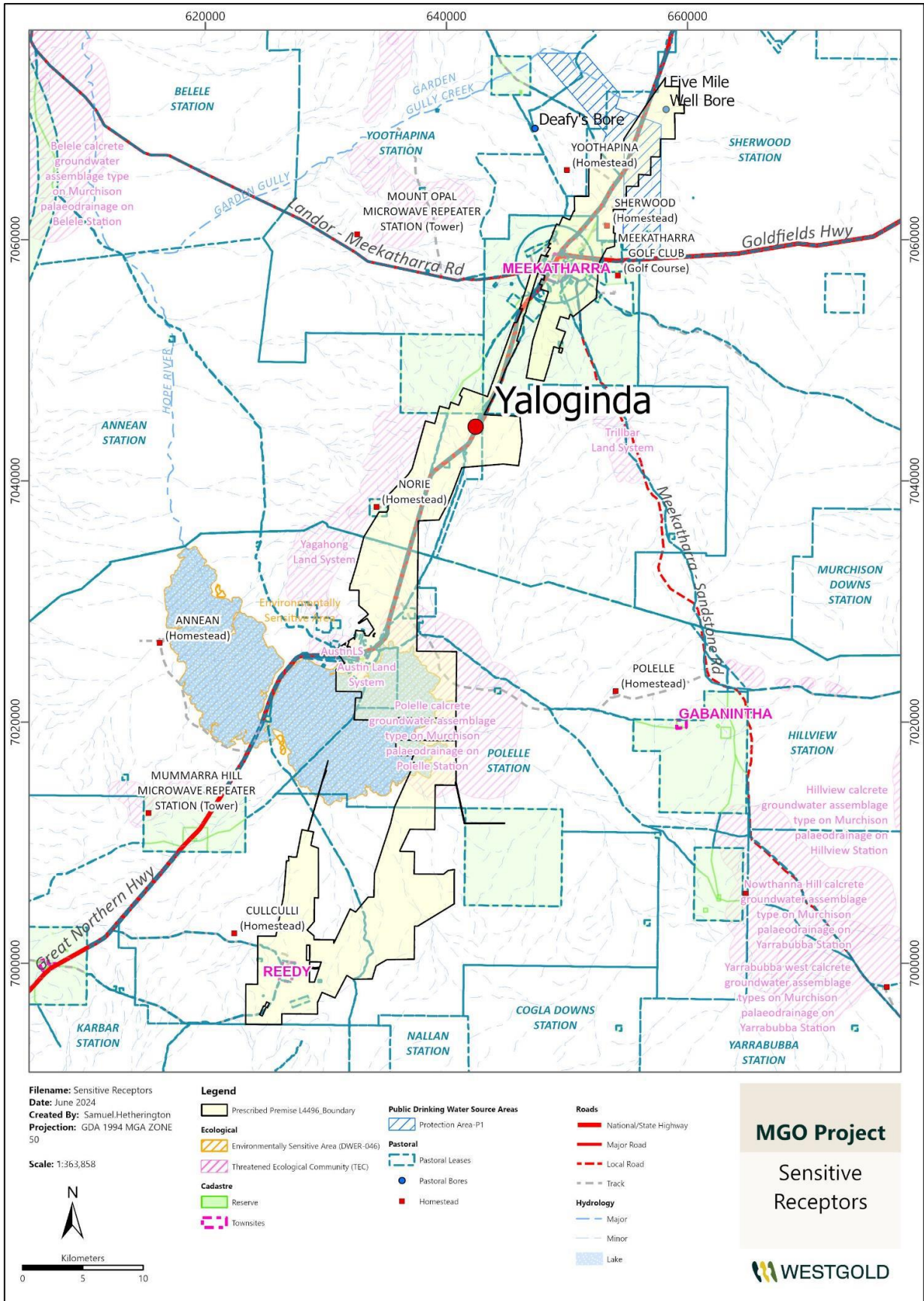


Figure 5: Distance to sensitive receptors

6.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020a) for each identified emission source and takes into account potential source-pathway and receptor linkages as identified in Section 6.1. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the applicant has proposed mitigation measures/controls (as detailed in Section 6.1), these have been considered when determining the final risk rating. Where the delegated officer considers the applicant's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the works approval as regulatory controls.

Additional regulatory controls may be imposed where the applicant's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 8.

Works approval W6971/2024/1 that accompanies this decision report authorises construction, commissioning, and time-limited operations. The conditions in the issued works approval, as outlined in Table 8 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

A licence or licence amendment for licence L4496/1988/11 is required following the time-limited operational phase authorised under the works approval to authorise emissions associated with the ongoing operation of the premises. A risk assessment for the operational phase has been included in this decision report, however licence conditions will not be finalised until the department assesses the licence application.

Table 8: Risk assessment of potential emissions and discharges from the premises during construction, commissioning, and operation

Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
Construction								
Construction of the GNHIPTSF and associated infrastructure Movement of vehicles and mobile equipment Construction of additional monitoring bores	Dust	Pathway: Air / windborne pathway Impact: Potential impacts to vegetation health	Nearby native vegetation	Refer to Section 6.1	C = Slight L = Possible Low Risk	Y	Condition 1 – design and construction / installation requirements for infrastructure and equipment. Condition 4 – construction and installation requirements for groundwater monitoring bores.	N/A
Construction of the Bluebird Paste Plant and associated infrastructure Movement of vehicles and mobile equipment					C = Slight L = Possible Low Risk	Y	Condition 1 – design and construction / installation requirements for infrastructure and equipment.	N/A
Commissioning								
Commissioning of GNHIPTSF, pipelines, and telemetry	Tailings and decant return water	Pathway: Discharge to land / runoff from potential spillage / leak Impact: Potential impacts to vegetation health, soil, and surface water	Nearby native vegetation Soil Groundwater	Refer to Section 6.1	C = Minor L = Unlikely Medium Risk	Y	Condition 8 – environmental commissioning requirements for TSF pipelines, spigot, decant pump, and telemetry. Condition 9 – authorised discharge points during environmental commissioning. Condition 10 – ambient groundwater monitoring around GNHIPTSF.	N/A
Commissioning of Bluebird Paste Plant and pipeline infrastructure	Paste Plant slurry	Pathway: Discharge to land / runoff from potential spillage /	Soil Groundwater		C = Minor L = Unlikely	Y	Condition 8 – environmental commissioning requirements for paste plant and associated infrastructure.	N/A

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Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
		leak Impact: Contamination to soil / groundwater			Medium Risk		Condition 9 – authorised discharge points during environmental commissioning.	
Time-limited-operations operations								
Operation of the GNHIPTSF (and combined GNHIPTSF and BEIPTSF) including the decant recovery infrastructure	Seepage of leachate including wall failure of the TSF	Pathway: Infiltration through the foundation base to soils and groundwater Impact: Potential contamination of soils and groundwater. Increasing groundwater levels due to seepage can cause impacts to the health and survival of vegetation (waterlogging / increased salt concentrations).	Soil Groundwater Nearby native vegetation	Refer to Section 6.1	C = Moderate L = Unlikely Medium Risk	Y	Condition 15 – operational requirements for infrastructure and equipment during time limited operations. Condition 21 – ambient groundwater monitoring around GNHIPTSF. Condition 22 – undertake a monthly water balance.	N/A
		Pathway: Infiltration through the walls through soils and to groundwater Impact: Potential contamination of soil and groundwater	Soil Groundwater		C = Moderate L = Unlikely Medium Risk	Y		N/A
	Tailings	Pathway: Overtopping of tailings from the	Soil Surface water		C = Minor L = Rare	Y		<u>Condition 23 – undertaken visual inspections of infrastructure.</u>

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Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
		TSF Impact: Potential contamination of soil, surface water, and groundwater	Groundwater		Low Risk			<u>(perimeter embankment and freeboard).</u>
Operation of tailings and return water pipelines	Tailings and decant return water	Pathway: Discharge to land / runoff from potential spillage / leak Impact: Potential impacts to vegetation health, soil, and surface water	Nearby native vegetation Soil Groundwater	Refer to Section 6.1	C = Minor L = Unlikely Medium Risk	Y	Condition 15 – operational requirements for infrastructure and equipment during time limited operations.	<u>Condition 23 – undertaken visual inspections of infrastructure (perimeter embankment and freeboard).</u>
Loading, transport and stockpiling of tailings from Bluebird North TSF	Dust	Pathway: Air / windborne pathway Impact: Potential impacts to vegetation health	Nearby native vegetation	Refer to Section 6.1	C = Slight L = Possible Low Risk	Y	Condition 15 – operational requirements for infrastructure and equipment during time limited operations.	N/A
Operation of the Bluebird Paste Plant and associated pipeline	Release of hydrocarbons, cement agents, production water or final paste product	Pathway: Discharge to land from potential spillage / leak Impact: Contamination to soil and surface water	Soil Surface water	Refer to Section 6.1	C = Moderate L = Unlikely Medium Risk	Y	Condition 15 – operational requirements for infrastructure and equipment during time limited operations.	General provisions of the <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i> apply.
	Sediment laden / contaminated stormwater	Pathway: Discharge to land from potential spillage / leak Impact: Contamination to soil and surface	Soil Surface water	Refer to Section 6.1	C = Moderate L = Unlikely Medium Risk	Y		N/A

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Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
		water						

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

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

7. Consultation

Table 9 provides a summary of the consultation undertaken by the department.

Table 9: Consultation

Consultation method	Comments received	Department response
Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) advised of proposal 29 October 2024	Refer to Section 5 for DEMIRS' comments.	Refer to Section 5 for the department's response.
Applicant was provided with draft documents on 19 December 2024	No comments provided. The applicant requested to waive the 21-day review period and to issue the works approval.	Not applicable.

8. Conclusion

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

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4. CMW Geosciences (CMW) 2023, *Annual Audit and Management Review Bassett's West and Bluebird East In-Pit TSFs – 2022/2023 Central Murchison Gold Project Report (PER2023-0182AB Rev 0)*, unpublished report for Big Bell Gold Operations Pty Ltd.
5. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
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8. DWER 2020b, *Guideline: Environmental Siting*, Perth, Western Australia.
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11. Rockwater 2015, *Hydrogeological Model of Bluebird East Pit*, Perth, Western Australia. Unpublished report for Metals X Group Limited.
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14. Tetra Tech Coffey (Coffey) 2024, *Bluebird Gold Mine – GNH Pit TSF Conversion (Reference: 754-PERGE340337-R02)*, unpublished report for Westgold Resources Limited.
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