Government of Western Australia
Department of Water and Environmental Regulation

Amendment Report

Application for Licence Amendment

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

Licence Number	L5206/1987/10
Applicant	Wiluna Operations Pty Ltd
ACN	166 954 525
File number	APP-0027070
Premises	Wiluna Mine Site WILUNA WA 6646 Mining tenements: M53/30, M53/32, M53/468, L53/62, L53/20, M53/64, G53/18 and G53/19 and part tenements M53/40, M53/44, M53/50, M53/26, M53/6, M53/95, M53/96, M53/200, M53/69, M53/24 L53/50 and L53/77 As defined by the coordinates in Schedule 4 of the licence.
Date of report	14 July 2025
Decision	Revised licence granted

Christine Pustkuchen

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Manager, Resource Industries
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

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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 operations at the premises. As a result of this assessment, amended licence L5206/1987/10 has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this amendment 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, available at https://dwer.wa.gov.au/regulatory-documents.

2.2 Overview of the premises

2.2.1 Overview of the operations

Wiluna Mine Site (the premises) is located in the Goldfields-Esperance region of Western Australia, approximately 5 kilometres (km) southeast of the town of Wiluna and 950 km northeast of Perth (Figure 1). The premises comprise of several mining leases and miscellaneous licences within the East Murchison Mineral Field (Figure 2).

Modern operations of this gold mine started in 1987 with numerous transfers of ownership occurring since then. In 2014 the premises were acquired by Wiluna Mining Corporation Pty Ltd (the licence holder, Wiluna Mining), who entered administration in 2022 and is currently under the control of FTI Consulting Pty Ltd.

Operations at the premises include open pit and underground mining of gold ore. The premises comprise sixteen open pits with some, historically used for the storage of tailings or decant water, after excavation was completed. A total of twelve underground portals were also constructed with a mining approval granted in April 2024 to further expand the underground operation (registration ID 122144). Once fully underway, underground operations will extend across the length of the premises from north to south (Figure 3).

Processing of gold ore occurs at the Carbon in Leach (CIL) cyanidation circuit, located in the southern side of the premises. The CIL plant throughput currently includes oxide ores and a concentrate from the reprocessing of historic tailings from the Wiltails plant. Historic tailings at the Wiltails plant are sourced from three of the twelve paddock style tailings storage facilities (TSFs) at the premises. The licence holder is planning to expand historic tailings reprocessing to all in-pit TSFs in the future, however, approval under part V of the EP Act has not yet been sought. Sulphide ores found at the premises were due to be processed at the Sulphide plant however, operations of this plant ceased after the licence holder entered administration.

There are a total of seven in-pit tailing storage facilities (TSFs) and five paddock style TSFs at the premises with only one actively used for the storage of tailings. Additional infrastructure includes a landfill, a bioremediation facility, sewerage, process and evaporation ponds.

Wiluna Operations Pty Ltd holds a licence issued under the *Rights in Water Irrigation Act 1914* to extract groundwater for mining purposes.

All activities falling under part V of the EP Act at the premises, are regulated under licence L5206/1987/10, works approvals W6660/2022/1 and W6615/2021/1, and registration R2025/2008/1.

A general layout of the mining operations including the containment infrastructure are illustrated in Figure 4.

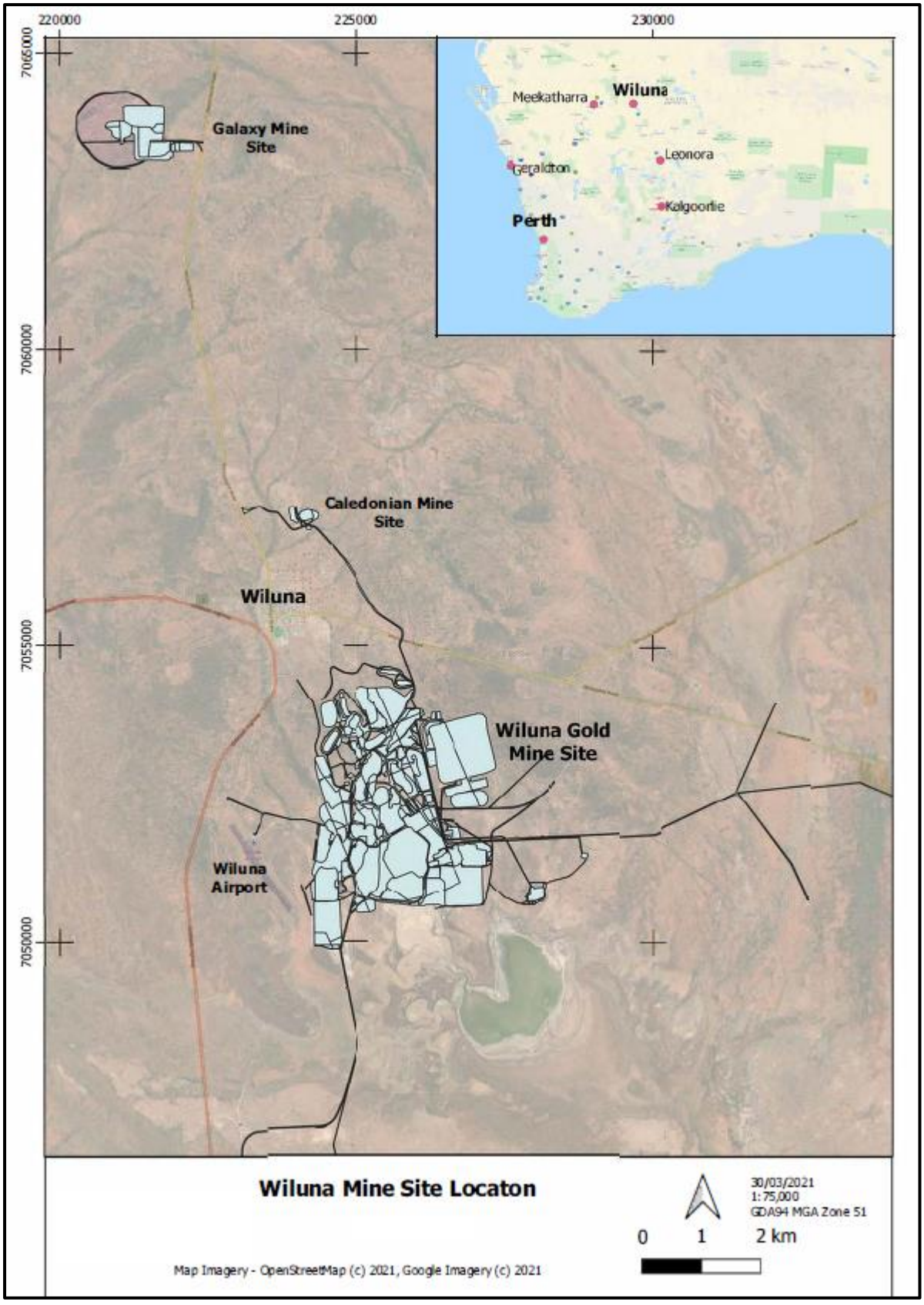
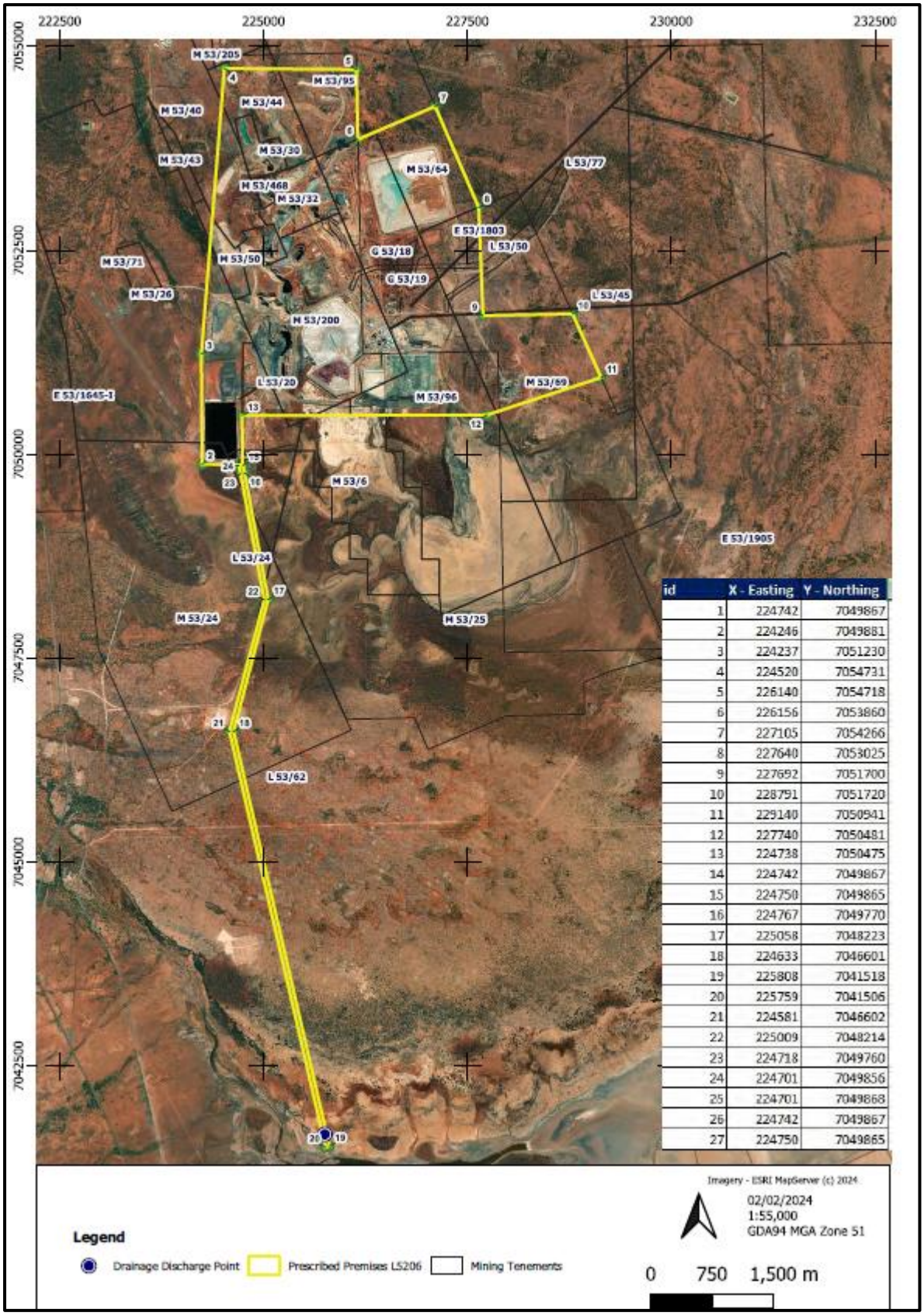


Figure 1. Location of the premises within the Goldfields-Esperance region



id	X - Easting	Y - Northing
1	224742	7049867
2	224246	7049881
3	224237	7051230
4	224520	7054731
5	226140	7054718
6	226156	7053860
7	227105	7054266
8	227640	7053025
9	227692	7051700
10	228791	7051720
11	229140	7050941
12	227740	7050481
13	224738	7050475
14	224742	7049867
15	224750	7049865
16	224767	7049770
17	225058	7048223
18	224633	7046601
19	225808	7041518
20	225759	7041506
21	224581	7046602
22	225009	7048214
23	224718	7049760
24	224701	7049856
25	224701	7049868
26	224742	7049867
27	224750	7049865

Figure 2. Prescribed premises boundary

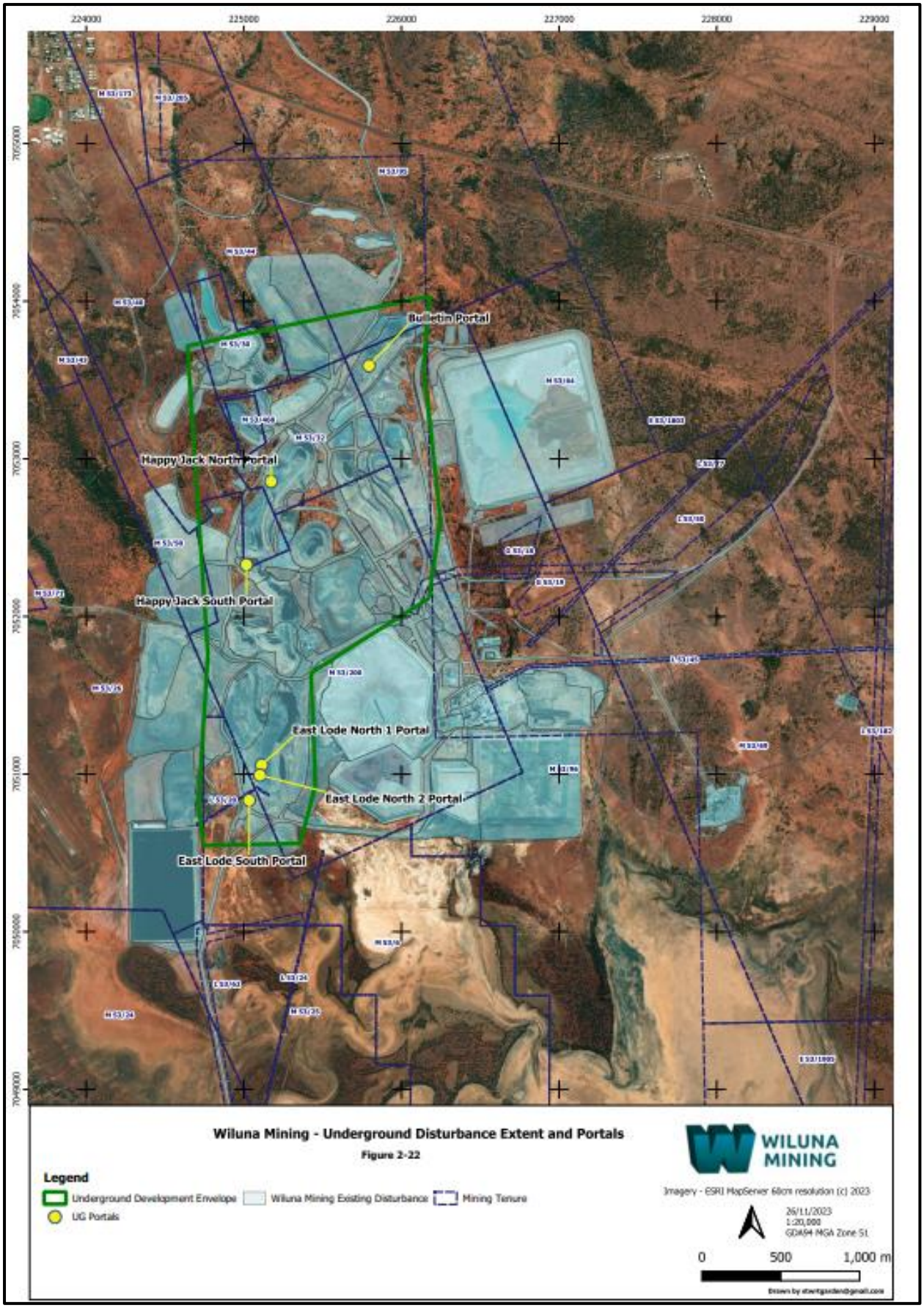


Figure 3. Extent of the underground operations at the premises

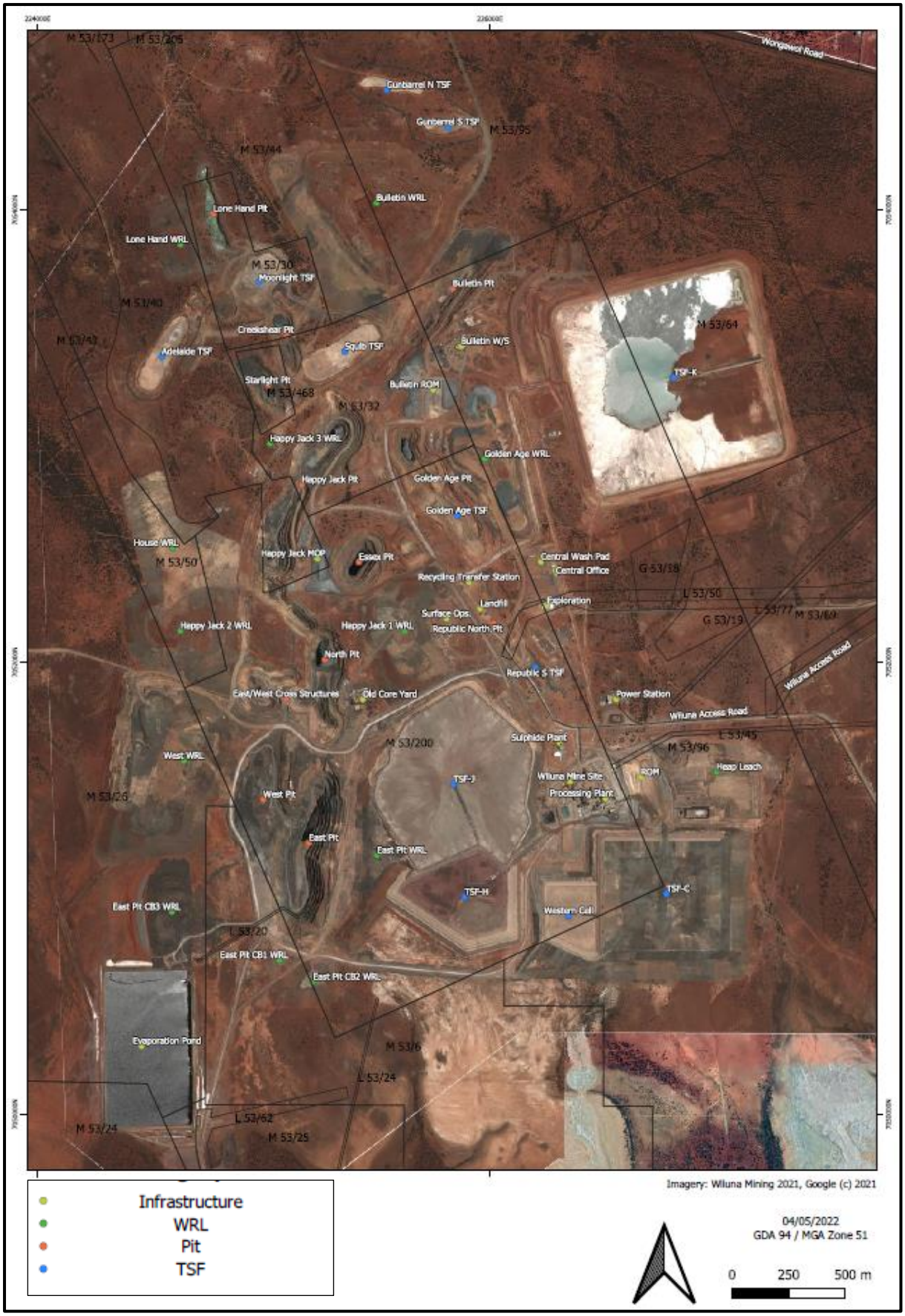


Figure 4. Premises general layout, showing the infrastructure, waste rock landform (WRL), open pits and TSFs.

2.2.2 Overview of the environment

Hydrogeological and geological context

The premises are situated in the northern to northwestern extent of the Archean Norseman-Wiluna Greenstone Belt, part of the Yilgarn Craton (Hargemann *et al*., 1992). The Archean bedrock is bound by granitoid intrusions that extend across the Carey Paleovalley to the south and are evident in the Lake Way and Lake Violet systems.

An southward-trending eroded pediment forms an interfluve between two drainage lines, both tributaries of the Lake Violet Paleochannel. Groundwater in the area is part of the phreatic regolith aquifer system of the Yilgarn Craton. It typically occurs beneath a thin (approximately 1 metre) layer of alluvial and colluvial sediments, overlying a saprolitic horizon.

Gold mineralisation is associated with structural features such as faults, shear zones, and quartz reefs. These features frequently host groundwater, particularly within the shallow oxidised zones adjacent to quartz reefs.

Mining history and dewatering impacts

Mining in the area dates back to the 1800 with dewatering undertaken to maintain dry mining conditions. Dewatering rates in the East mine in the late 1930s were reported to be approximately 2,950 cubic meters (m^3) per day later decreased to 650 m^3 per day. Similarly, high dewatering rates were also sustained by the Happy Jack and Bulletin pits. This rates significantly impacted both groundwater flow and quality in the area.

2018 hydrogeological investigation

A 2018 hydrogeological investigation of the premises revealed that complete oxidation of the saprolite regolith occurred between 20 and 40 meters below ground level (mbgl). Groundwater was found in the saprolite layer at a depth of 30 and 40 mbgl at monitoring bores near the Squib and Golden Age pits. The investigations also showed that high dewatering rates, combined with lake evaporation in the Bulletin and Happy Jack pits, resulted in cones of depression in groundwater levels. This led to a shift in the historical groundwater flow direction from predominately north-south to a more westerly to south westerly trend (KH Morgan, 2018).

The investigation extended to the area adjacent to TSF where no groundwater was found up to a maximum depth of 20 mbgl.

Groundwater salinity was shown to range between 10,000 milligrams per litre (mg / L) to the north of the premises and 100,000 mg / L in proximity to the salt lakes. However, salinity concentration in the open pits was higher due to the effect of evaporation. Groundwater pH was found to be neutral.

2.3 Application summary

On 12 January 2025, the department received an application to amend licence L5206/1987/10 under section 59B of the *Environmental Protection Act 1986* (EP Act) requesting the following:

- construction of TSF K Stage 3 and 4 raises and subsequent operations
- re-instatement of the Golden Age in-pit TSF within the TSF extended footprint

While not specifically referred to as part of the scope of this amendment, the licence holder stated that toll treatment of gold ores, may potentially form part of the operations at the premises in the future. Please refer to section 2.3.3 for further details of this process and the licence holder commitments during operations.

Categories and assessed design capacity defined under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations) are shown on the licence subject to this amendment. No changes to current throughputs were requested by the licence holder.

2.3.1 Construction and operations of TSF K Stage 3 and 4 raises

Background

TSF K is located to the north-eastern corner of the premises on mining tenements: M53/64, M53/69 and M53/96. TSF K has an approximate footprint of 124 hectares (ha) and is the only tailings containment infrastructure actively used at the premises, receiving tailings streams from the CIL Plant and oversized scats generated at the Wiltails plant. Oxide tailings streams, as a result of historical processing, are also stored at the TSF. The TSF construction started in 2019 under works approval W6248/2019/1. Operations of the TSF were transitioned to the licence in 2020. In 2021, an amendment was granted to authorise the construction and operations of Stage 2 embankment raise to a height of 518.5 metres reduced level (mRL) (16.5 metres above ground surface). The licence holder anticipates that TSF K will be at full capacity in July 2025 and seeks approval to undertake Stage 3 and 4 raise construction. Provided all approvals have been obtained, Stage 3 raise construction will commence in December 2025 after a four-month tailing settlement period. Stage 4 construction is anticipated for June 2027 with operations commencing in October of the same year. TSF K is classified as a category 1-high under the Department of Energy Mines Industry Regulation and Safety (DEMIRS) Code of Practice Hazard Rating Classification (DMP, 2013) and High B under the Australian National Committee on Large Dams (ANCOLD) classification.

Embankment raises

Using an upstream construction method, the proposed Stage 3 and 4 raises will raise the height of the embankment by a further three meters on each stage of construction. Crest height will reach 521.5 mRL on Stage 3 and 524.5 mRL on stage four with crest width measuring approximately 7 meters. The embankment design slopes will be of 1 Vertical (V) to 2 Horizontal (H) upstream (inner zone) and 1(v):3(H) downstream (outer / capping zone). Construction materials will consist of compacted dry tailings or clayey borrow material and mine waste upstream, and competent mine waste and dried tailings downstream. All material will be sourced at the premises and will be non-acid forming. Materials will be independently geotechnically tested to meet the standards set out in the design report provided with the application. Dried tailings within the perimeter embankments will be placed in homogeneous horizontal layers not exceeding 300mm compacted lift thickness. Materials failing the compaction and/or moisture tests and ratios will be reworked to achieve the appropriate standard. It should be noted that dried tailings at the premises have been shown to have strain-softening properties. The licence holder stated that compaction of materials (density ratio greater than 95% of standard maximum dry density) will render tailings unlikely to liquefy under stress deriving from dynamic loading or seismicity. Structural stability of the TSF will be assessed by DEMIRS under the relevant mining approval.

A 2% cross-fall towards the upstream side will apply to the embankment crest to ensure drainage into the TSF. A windrow equal or larger than 500millimetres (mm) height or ½ the wheel height of the largest vehicle will be left on the outside of the crest of the perimeter embankment as well as both sides of the decant access way. Windrows will have gaps left at 30m centres to maximise drainage and avoid ponding on the crest.

Additional storage volumes provided by stage 3 and 4 raises will be of approximately 4 and 5.5 million cubic meters respectively. This will achieve a total storage capacity of 11 and 15.5 million cubic meters of tailings during operations of the TSF respectively.

Decant system

The existing supernatant pond will be maintained around the centrally located decant structure. The decant tower is currently accessed through an accessway. This will be raised using a centreline construction method, to match the height of the embankment. The raise material will mainly consist of mine waste. A wearing course will form the upper 100 mm. Both sides of the decant accessway will have a windrow of 500 mm or more, or ½ the wheel height of the largest vehicle. The access ramp will have a gradient no steeper than 1V:8H and a crest width of

approximately 8 m. 1.8 slotted precast concrete well liners will form the decant tower with free draining surrounding filter rock.

Seepage infrastructure and management

TSF K was constructed with an underdrainage system upstream of the west and south perimeter embankment to reduce phreatic surface and seepage through the base. The underdrainage system consists of 100 mm diameter slotted pipes grading to 100 mm diameter unslotted pipes carrying any intercepted seepage to an external sump located in the southwest of the TSF.

Toe drains were constructed in the north and northeast perimeter embankments and currently collect and divert any seepage percolating through the TSF embankment.

The licence holder stated that the above infrastructure combined with effective management of the decant pond, and the use of the appropriate construction material will ensure that seepage is kept to the calculated 2.5×10^{-4} and 3.0×10^{-4} cubic meters per day per metre of embankment in Stage 3 and 4 respectively, or 0.8 and 1.0 cubic meters per day respectively, throughout the embankment perimeter.

Stormwater management

Stormwater management at TSF K currently occurs through the following measures:

- diversion drains along the western side of the embankment comprising of channels of a base varying from 3 to 6 meters
- diversion drain to the northern side of the TSF
- 300 mm high bunds along the TSF side of the diversion drains to protect the embankment from any flood water
- toe drains downstream of the north and northeast perimeter embankment to collect and divert rainfall (as well as seepage) away from the embankment. A Rock armour along the toe of the north perimeter embankment has been constructed to prevent erosion.

A stormwater diversion drain and adjacent bund extension to the northeast of the waste rock stockpile was due to be constructed as part of TSF K Stage 2 raise. The diversion drain was designed to minimise and divert northern catchment flows occurring along the western flank of the TSF in an easterly direction, around the north-east of the TSF. This piece of infrastructure was still outstanding in 2024 when the Environmental Compliance Report on the Stage 2 raise construction was assessed by the department. The diversion drain requirement is still shown on the licence under condition 1.2.8.
No additional measures have been proposed by the licence holder for stormwater management.

Tailings discharge and water management operations

Tailings discharge will occur similarly to the current operations. Tailings slurry will be discharged subaerially in layers of a maximum of 300 mm thickness from a series of spigots located on the upstream perimeter embankment crest. Supernatant water within the pond will be removed via a pump designed to recover a minimum of 10,716 tonnes per day of slurry water inflow. This will ensure that the pond is maintained at a maximum radius of 100 m and away from the sides of the embankment to reduce seepage and maintain stability. Return water will be directed to the processing plant for re-use or to the process pond. The current freeboard of 500 mm (condition 1.2.3 on the licence) will continue to apply. This includes a 300 mm for a 72-hour, 1:100 year or 1% AEP storm event. The Delegated Officer notes that no allowance for wave run-up as recommended by the ANCOLD guidelines (2019) was allowed for, however the licence holder states that the separation distance from the perimeter of the embankment will be sufficient to limit any risk associated with a possible wave action.

Current monitoring infrastructure and requirements

Current monitoring infrastructure at TSF K comprises of four groundwater monitoring bores,

(TD17K – TD19K on the licence) and four standpipe piezometers (PZ1 – PZ4) – Figure 5. The groundwater bores became operational in June 2020. A monitoring program that includes standing water level and several metal, metalloids and non-metal parameters has been an obligation under the licence since the TSF construction. A limit of 4 mbgl with a target of 6 mbgl currently applies. Limits also apply to concentrations of soluble arsenic (0.4 mg/L) and weak acid dissociable cyanide (0.5 mg/L). Frequency of monitoring under the program varies either quarterly or annually depending on the parameter monitored (condition 3.4.1).

The standpipe piezometers are located to the north and south of the embankment wall. Piezometers monitoring is outside the scope of the licence conditions, however, TSF K Stage 2 embankment raise application showed that trigger levels were set by the licence holder, and controls were implemented to maintain an acceptable factor of safety of the embankment.

The licence holder deemed the current monitoring infrastructure sufficient for Stage 3 embankment raise operations, however it was proposed to replace the piezometers during Stage 4 raise construction in adjacent locations to the existing ones.

Figure 5. Location of current groundwater bores (MB1-4, equivalent to TD17K-20K on the licence) and standpipe piezometers (PZ1-4)

2.3.2 Reinstatement of the Golden Age in-pit TSF

Background

The Golden Age pit is located at the centre of the premises, within mining tenements M53/32

and M53/200. The pit is positioned approximately 370 m above and 80 m to the east of an active underground excavation portal. Historical mining of this pit targeted the upper oxide ores through conventional methods including drilling and blasting. After extraction was completed, the pit was actively used to store oxide tailings. Eventually the pit's capacity was reached and in 2012 this was recorded on the licence. Currently only a small volume of tailings remains within the pit (southern side), as the majority was used for a variety of construction projects around the premises.

In September 2024 a mining approval was granted to resume excavation of the fresh and transitional ore within the deposit (reg ID: 126824). This excavation is currently taking place and is expected to end around July 2025. Excavation will expand the pit's footprint by approximately 0.73 hectares and will almost double its depth to 95 m. Given the proximity to the Waste Rock Landform (WRL) to the east, and some concerns with the stability of the east wall of the pit, the licence holder will reduce the WRL footprint on the western side. However, as additional stockpiling of waste rock will occur during the excavation of the pit, the footprint of the WRL will be expanded to the northeast. Layout of the expanded Golden Age (cutback) pit and waste rock landform are shown in Figure 6.

After this second phase extraction is complete, the licence holder proposed to reinstate of the Golden Age pit, as an active in-pit tailings storage facility. The re-instatement will allow the continued operations during the consolidation of stage 2 tailings within TSF K, prior to the construction of the stages 3 and 4 raises. Tailings deposition at the Golden Age in-pit TSF is proposed to start between July and August 2025 provided all required approvals have been obtained. Phase one of the discharge is anticipated to last for approximately eight months followed by a settlement period of 10 months till February 2027. A second phase of deposition will then take place until the pit reaches its full capacity, expected around April / May 2027. An approximate volume of 3.5 megatonnes of tailings will be contained within the TSF.

The TSF is classified as a category *2-Medium* under the Department of Energy Mines Industry Regulation and Safety (DEMIRS) Code of Practice Hazard Rating Classification (DMP, 2013) and *Significant* under the Australian National Committee on Large Dams (ANCOLD) classification. A mining proposal for the re-instatement of the Golden Age in-pit TSF was granted by the DEMIRS in May 2025 (registration ID: 500132).

Tailings discharge and water management operations

Discharge of tailings at the Golden Age In-pit TSF will occur via two existing single discharge points, located to the north and to the south sides of the pit. Discharge of tailings will commence from the southern end. Both discharge points will remain operational for the duration of the discharge. The pit will hold approximately three million cubic meters of tailings at a density of 1.25 tonnes per cubic meter, provided that the decant pond is managed appropriately. The subaerial beach slope will measure approximately 0.5 % and the subaqueous 2%.

Dewatering of the pit is currently occurring through a sump pump, or submersible pump inside a borehole, as the pit is being excavated. Dewatering will continue until deposition of tailings begins. When deposition begins the sump pump will be replaced by a decant water recovery system. A skid-mounted pump, fitted with a floating suction device, will extract the water from the southern pit first from the bottom of the western ramp at an approximate height of 1465 mRL. The pump will be drawn in an upward direction as more tailings are deposited.

The pump will require a minimum return pump rate of 100 L/sec (90% availability) with a peak rate of 125 L /sec (based on 90% availability), to allow the removal of the rainwater associated with a 1:100 Annual Exceedance Probability (AEP) 24 hours storm event (an additional 2,100 cubic meters per day). It should be noted that if this magnitude of rainfall event does occur, removal of the additional volume of water must be undertaken within 10 calendar days. During operations, the decant pond will be maintained at a maximum of 50,000 cubic metres – i.e., approximately one week's worth of tailings discharge. Tailings deposition and water recovery will also be managed to ensure the pond remains below the exposed western ramp. Figure 7

shows the Golden Age Pit layout. Tailings discharge and decant pond management during the two phases of operations are illustrated in Figure 8.

A minimum operational freeboard of 300 mm and a total freeboard of 500mm below the pit rim level will apply ensuring that 1:100 AER 24 hours storm event is allowed for. Height of tailings' beach elevation was estimated at around 1508.5 mRL (Figure 9).

New pipelines will be installed to connect the in-pit TSF to the existing TSF K pipelines. Pipelines will be assembled on already disturbed ground along the outside toe of the abandonment bund and construction specifications will comply with the existing licence conditions. Decant water will be discharged to the process pond (engineered and lined) , referred as point reference C2D on the licence, as per the existing operations and used at the processing plant.

Seepage

A hydrological report provided by the licence holder (Rockwater, 2024) showed that dewatering of the in-pit TSF during the second excavation campaign will lead to an overall lowering of the saturated zone by an approximate 56 meters. However, as tailings deposition is resumed and dewatering stops, groundwater levels will rebound leading to groundwater inflow into the pit. This inflow will persist for some time until equilibrium between tailings deposition height and the height of the surrounding water table is reached.

As deposition progresses beyond the height of the water table some seepage will occur through the pit's embankments. The hydrological report did not quantify the expected volume of seepage, however, it predicted that it will be low, provided that the decant water is managed appropriately and in accordance with the previously mentioned requirements.

Final tailings depositions are anticipated to reach 1509 mRL in the northern side and 1503 mRL in the southern side of the pit with any tailings deposited above the pre-mining groundwater level (1490 mRL) contributing to the seepage volume (Rockwater, 2024).

Seepage direction was predicted to follow the hydraulic gradient to the west towards the Essex, North and Happy Jack pits (Figure 10). These open pits are free of tailings and pit lakes levels were predicted to remain approximately 25 m below the surrounding groundwater table. As a result, they will act as terminal groundwater sinks to the surrounding groundwater system, rendering groundwater contamination unlikely (Rockwater, 2024).

Based on the seepage findings, and the impracticalities surrounding the depth of the pit, the licence holder proposed not to construct an underdrainage system, but to monitor and review seepage after six months, to determine whether recovery bores may be necessary.

Water Balance

A water balance was undertaken by the licence holder. Monthly inflows included rainfall, groundwater inflow and slurry water. Outflows included evaporation and water retained in the tailings. Overall model assumptions and considerations are shown below:

- 12-month continuous operations were used, at full production rate with the calculated average tailings surface applied as a constant rate.
- The decant pond area was also considered to be constant at 3.7 hectares
- Wet tailings were considered to be an average of 80% of the subaerial beaches
- Runoff coefficients used in the calculation were:
    - 1.0 for freshly deposited beaches
    - 0.4 for moist beaches
    - 0.7 for pit walls and benches
    - 0.3 for external catchments

- Groundwater inflow was assumed to be as per dewatering rate (3 L / sec)
- Seepage was not considered
- Tailings dry density was considered to be 1.0 t / cubic m

Results of the water balance indicated an annual water return of 57% of the tailings slurry in average climatic conditions. Decant system requirements, to ensure the decant water is appropriately managed were discussed earlier, in section 2.3.2.

Groundwater monitoring infrastructure

Monitoring infrastructure surrounding the pit currently includes two groundwater monitoring bores to the west and south sides or the pit. The groundwater monitoring bores were re-drilled in 2020 after they suffered some damage due to infrastructure changes. The groundwater monitoring bores are shown as IPT4-B and IPT5-B on the licence. A monitoring program currently applies to all in-pit TSFs groundwater bores with quarterly or annually monitoring of several parameters similarly to those of TSF K. Limits apply to standing water level and dissolved arsenic as for TSF K, however unlike TSF K a Weak Acid Dissociable (WAD) cyanide concentrations limit does not apply. Reporting of monitoring results for all the Golden Age In-pit groundwater bores are submitted as part of the Annual Environmental Report (AER).

As part of this amendment, the licence holder proposed an additional groundwater monitoring bore to be constructed to the north of IPT5B (GAMB1), west of the pit. The monitoring program associated with this bore will be consistent with the existing one on the licence. Standard of bore construction will also remain the same and will comply with *ASTM D5092/D5092M-16: Standard practice for design and installation of groundwater monitoring bores.*

Groundwater Quality surrounding the in-pit TSF

Records of standing water levels monitoring, undertaken by the licence holder at IPT4 – B show that saturation occurred at approximately 26 mbgl throughout 2024. WAD cyanide and dissolved arsenic remained unmonitored in the first quarter of 2024 but were both below the limit for the rest of the year, at an average of 0.005 mg / L and 0.027 mg / L (limit 0.4 mg / L) respectively.

IPT5-B showed a depth to groundwater of 35 mbgl in 2024. WAD cyanide remained unmonitored on the first quarter of 2024 and was on average 0.02 mg / L throughout the following three quarters. Dissolved arsenic also remained unmonitored on the first quarter but averaged at 0.01 mg / L between quarter two and quarter four of 2024. It should be noted that Strontium was slightly elevated at both bores and was showing a concentration of 6.3 and 5.2 mg /L in both groundwater bores in December 2024 (yearly monitoring required by the licence). The licence holder will continue to monitor groundwater quality and levels at these bores to identify any potential changes arising from the deposition of tailings.

Unsealed exploration holes

The licence holder found that historical records of the premises showed that fourteen exploration holes, mostly located within the norther side of the pit, remain, and are likely to have been left unsealed after operations. The exploration holes intersect the Golden Age pit and the underground portal potentially providing a direct hydraulic pathway for tailings deposited into the pit, to migrate underground. The licence holder stated that historical datasets, are outdated and evidence of these exploration holes has yet to be found at the premises. Nonetheless, aside from any safety concerns (assessed by DEMIRS as part of the mining approval application), unsealed exploration holes could lead to groundwater contamination or could affect nearby sensitive receptors such as native vegetation. Given the potential safety and environmental risk, several measures to decrease this risk will be implemented. These include but are not limited to locating drillholes using a ground penetrating radar, updating historical drilling records, undertaking bore logging and integrity testing, and ensuring that safety of the underground portal is maintained through the application of shotcrete to walls and floor of the underground portal where evidence shows the potential presence of a drill hole. A full list of the proposed

controls to address any *potential environmental risk* from the unsealed exploration holes is shown on Table 1.

Stormwater management

An abandonment bund will be constructed surrounding the perimeter of the in-pit TSF. This will assist in diverting any external surface water around and away from the TSF. The bund will remain in place during the operations of the TSF. The abandonment bund will be approximately 2 meters high and will have a width of approximately 5 meters.

As for regional runoff, a hydrological assessment undertaken in 2020 confirmed that a series of drainage features and infrastructure diverted the runoff (including during a 1 in 100 AEP storm event) flowing south, around the east and west of the premises.

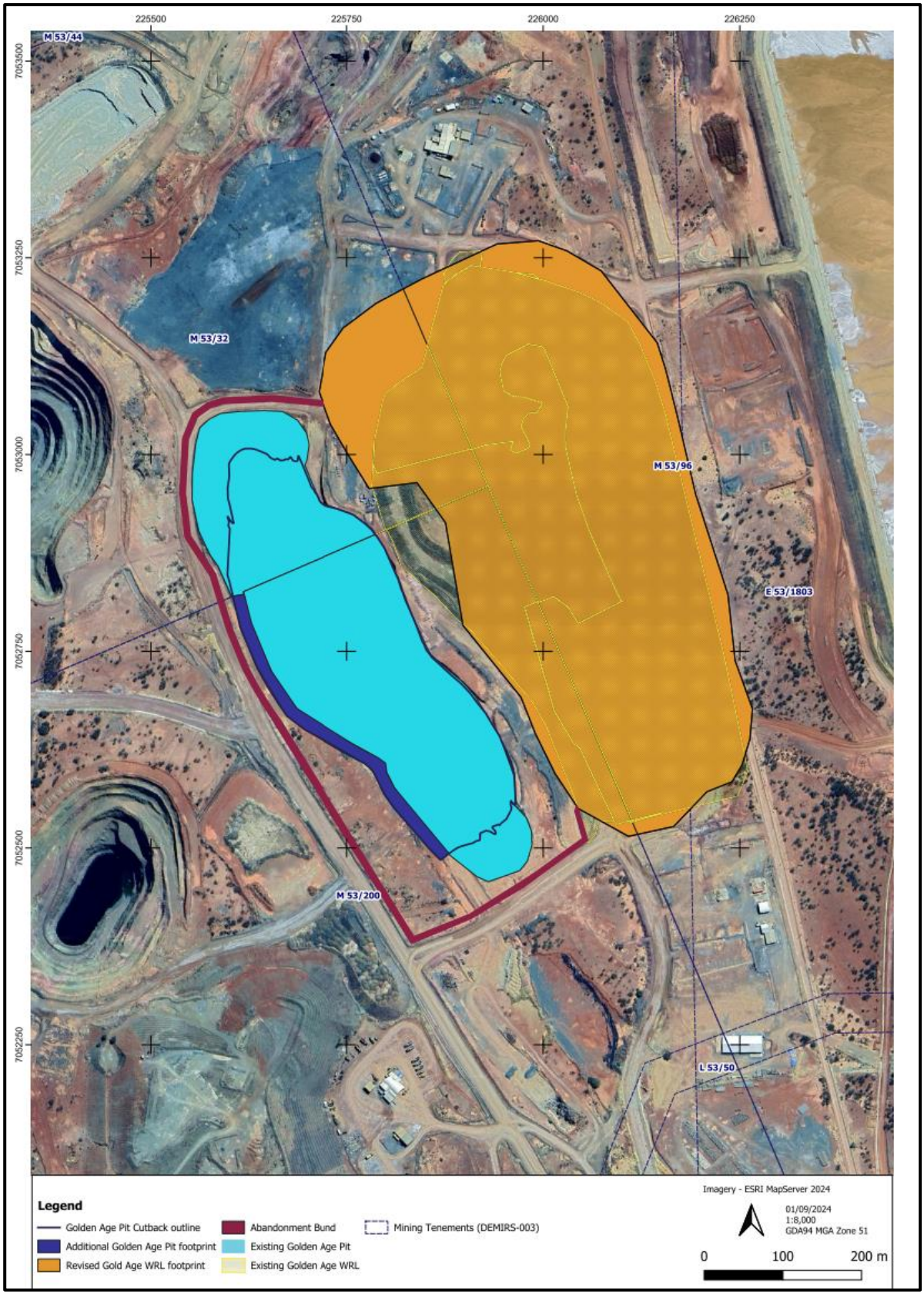


Figure 6. Golden Age Cutout and Gold Age WRL expansions

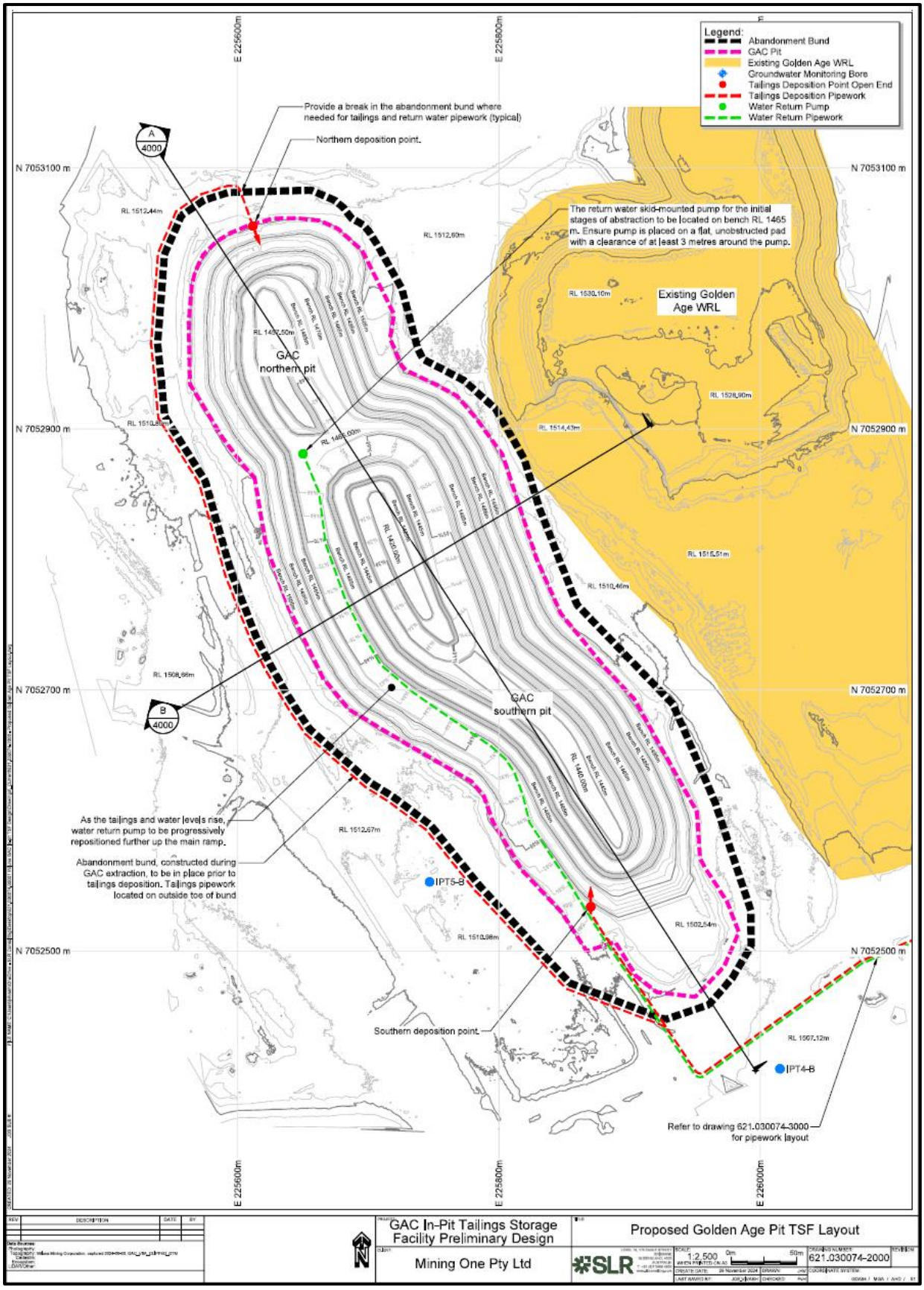


Figure 7. Golden Age In-pit TSF layout

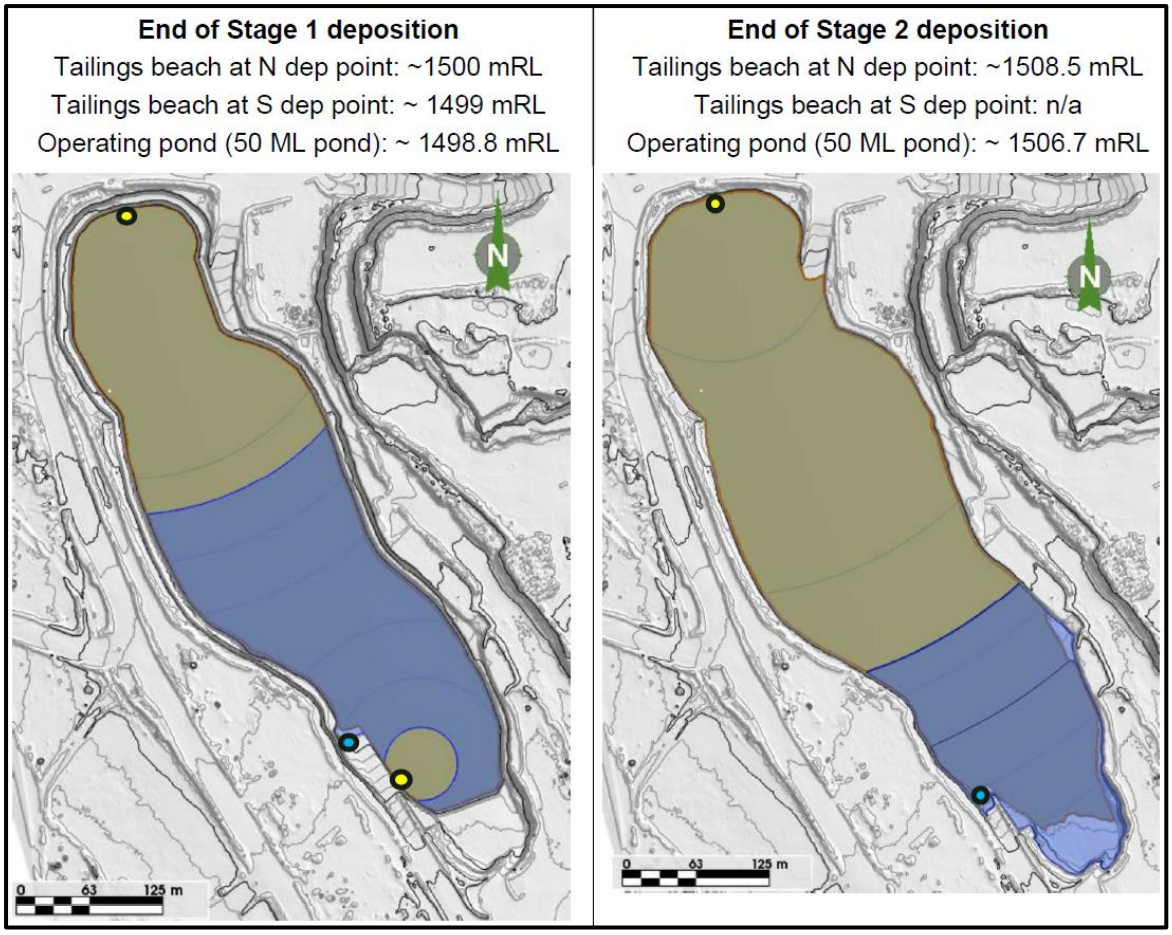


Figure 8. Tailings discharge and pond management at the Golden Age in-pit TSF during phase one and two of deposition

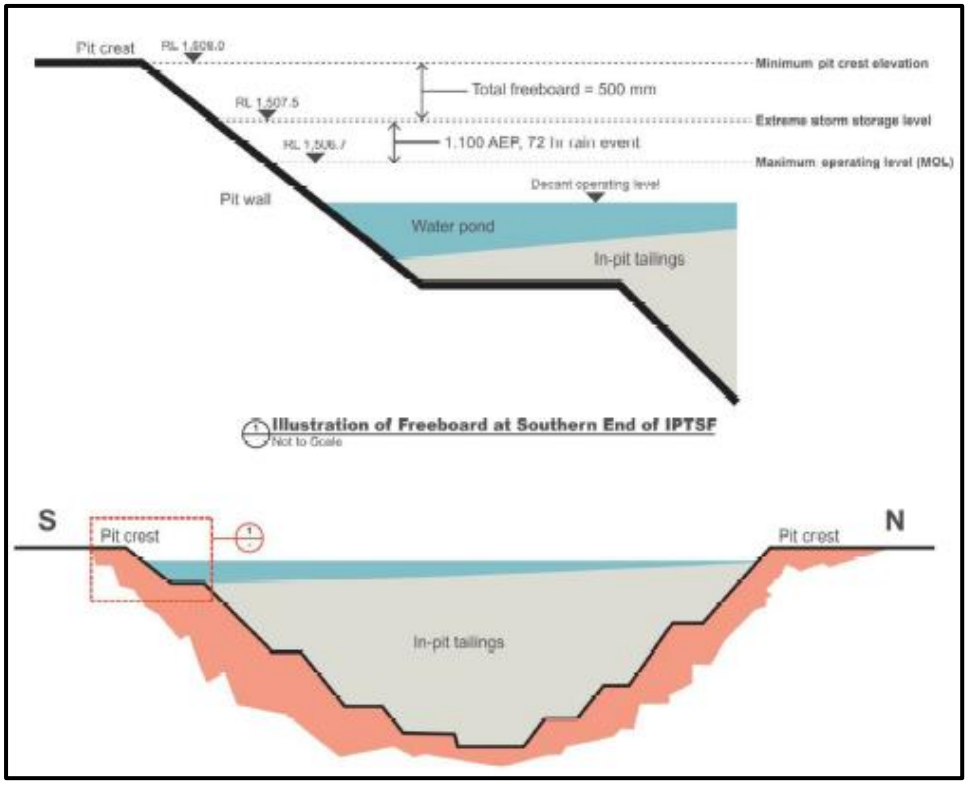


Figure 9. Representation of operational and total freeboard of the Golden Age in-pit TSF

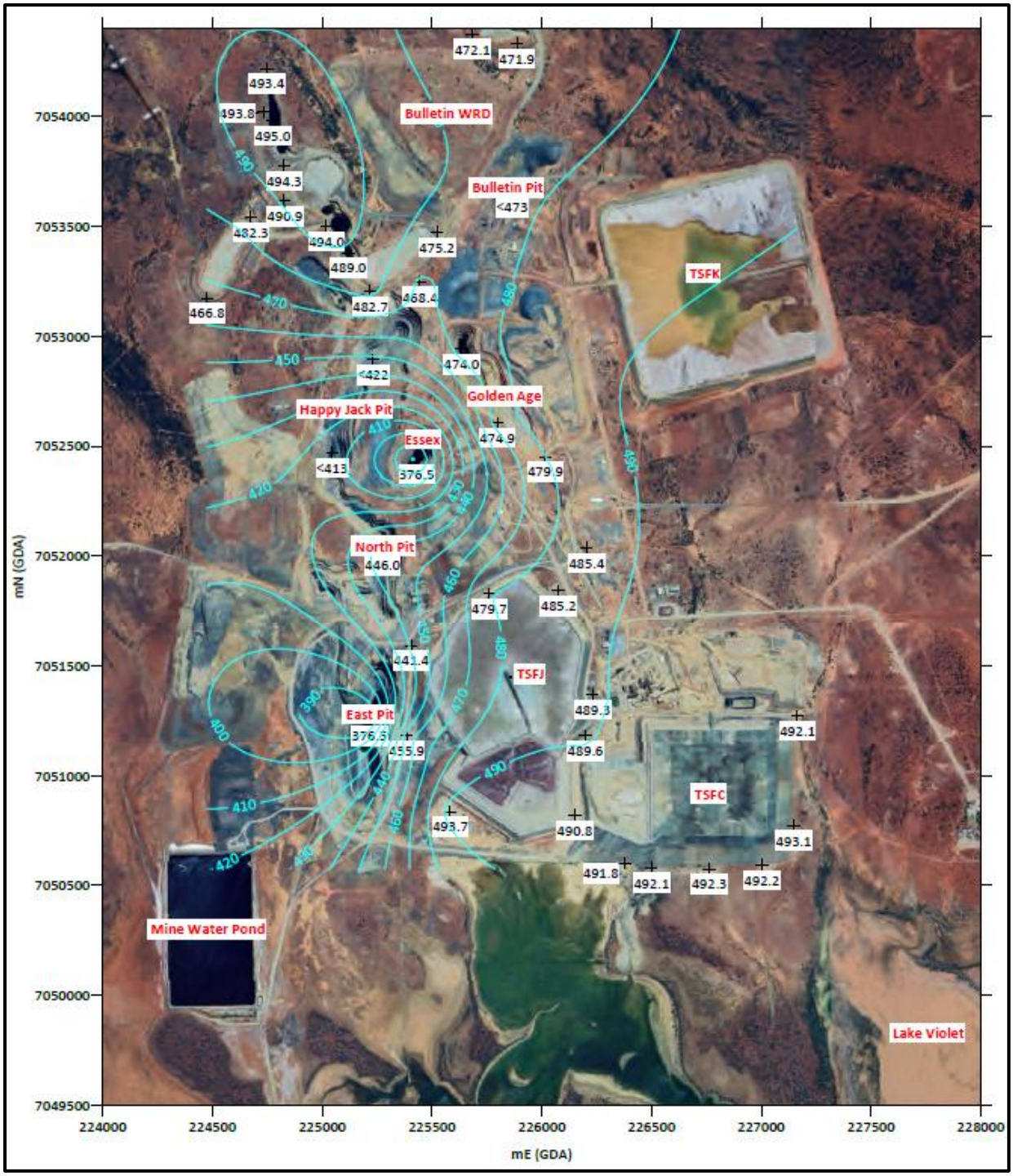


Figure 10. Equipotential lines at the Golden Age In-pit TSF and the surrounding open pits

2.3.3 Toll treatment of ore

During the application process the licence holder stated that toll treatment of ores may form part of the operations at the premises in the future. Toll treatment of ores previously occurred at Wiluna Mine Site, with the latest campaign taking place in 2021 in conjunction with Bullseye Mining Limited. The licence holder stated that toll treatment will be undertaken on an ad-hoc basis on behalf of small mining projects within the region. Toll treatment of ores was approved by DEMIRS under mining approval registration 126824, in late 2024.

The following commitments were made under the mining approval application:

- The licence holder will conduct a review of geochemical data for external ores
- The licence holder will undertake geochemical analysis of toll tailings after processing commences
- The licence holder will determine the geochemical compatibility of existing tailings and those resulting from toll treatment
- The licence holder will only undertake toll treatment if safe to do so, i.e., there are no concerns with point I, II and III above
- Processing of the treated ores will be halted should II show unforeseen environmental risk
- Outcomes of tailings geochemistry will be reported annually.

The licence holder confirmed that the licence annual throughput will not be affected by the ad-hoc operations.

3. Risk assessment

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

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

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

Table 1 shows the key emissions identified in this amendment report, along with their actual or likely pathway from the construction and operation of the infrastructure. It also details the control measures proposed by the applicant to mitigate or control these emissions.

Table 1: Licence holder proposed controls

Emission	Sources	Potential pathways	Proposed controls
Construction of TSF K lifts 3 and 4 and installation of Golden Age Pit additional infrastructure			
Dust	Construction of TSF K embankment raises, mobilisation and positioning of infrastructure associated with both TSF K and the Golden Age in-pit TSF, earthmoving.	Air/windborne pathway	• Water carts will be used to minimise dust generation • Vehicle movements will be reduced by using the largest practical vehicle • Speeds limits will apply to vehicles • Drop heights between excavators and trucks will be minimised • When excessive dust is generated and cannot be managed an incident will be recorded and reported to the supervisor on duty • Earth material that may contribute to dust generation will be removed

Emission	Sources	Potential pathways	Proposed controls
			• Vegetation in the surroundings will be regularly monitored for any impacts from dust generation.
Noise / Vibrations		Air/windborne pathway	• Noise will be managed in accordance with the *Environmental Protection (Noise) Regulations 1997* • Earth moving equipment will be maintained in accordance with manufacturer specifications • Machinery and equipment will be operated by qualified personnel • Any noise complaints will be investigated and addressed.
Contaminated stormwater		Overland runoff and infiltration	The licence holder has not proposed any controls during the construction of TSF K additional lifts and the work associated with the Golden Age in-pit TSF reinstatement.
Operations (TSF K)			
Dust from dry tailings deposition	Deposition of tailings (including those from toll treatment) following the construction of the two embankment raises	Airbourne / Wind dispersion	• Tailings will be kept at a slurry density between 38 and 45% when discharging • Daily inspections will occur to monitor dust generation within the TSF • Vegetation surrounding the TSF will be regularly monitored for any impacts from dust generation
Noise / Vibrations			The licence holder has not proposed any additional controls however, it is anticipated that the controls proposed during the construction activities will also apply to the operations of the TSF. Noise is regulated under the *Environmental Protection (Noise) Regulation 1997.*
Leachate		Vertical infiltration and horizontal migration	• The TSF raises will be constructed in accordance with ANCOLD and DEMIRS guidelines codes of practice • The decant pond size will be minimised to reduce seepage • Where excessive seepage occurs the licence holder will construct inception ponds to recover the water and re-direct it back to the TSF In relation to the toll treatment of ores: • The licence holder will undertake a

Emission	Sources	Potential pathways	Proposed controls
			review of the existing geochemical data for the external ore / tailings and compare it to the Wiluna tailings to determine whether co-deposition can occur • Following the commencement of processing the licence holder will undertake further geochemical analysis to determine the environmental risk to receptors • If environmental risk is identified, the licence holder will stop the processing of the external ores. To control all seepage, the licence holder will continue to implement the existing controls: **Condition 1.2.3** The decant pond area must not exceed 15% of the tailings beach area. **Condition 1.2.7** A daily visual assessment of the pond size and location. **Condition 1.2.11** A monthly water balance for each operational TSF. **Condition 3.4.1** Quarterly monitoring of standing water level (target 6 mbgl and a limit of 4 mbgl are applicable), soluble arsenic (applicable limit of 0.4 mg / L), pH, total dissolved solids, weak acid dissociable cyanide (applicable limit 0.5 mg / L), total cyanide. Annual monitoring of metal, metalloid and non-metal parameters.
Contaminated stormwater after a rainfall event		Overland runoff and infiltration	• Maintain existing stormwater diversion infrastructure associated with the TSF • Maintain a freeboard sufficient to contain a 1% AEP. Additionally, the licence holder will continue to comply with the *Environmental Protection (Unauthorised Discharges) Regulations 2004.*
Tailings slurry / supernatant water	Pipeline leaks or rupture	Direct discharge to land and	No additional controls have been proposed to those already existing on the licence.

Emission	Sources	Potential pathways	Proposed controls
discharge		infiltration	The licence holder will continue to implement the following existing controls: **Condition 1.2.6** The licence holder shall ensure that all pipelines containing alkaline water, saline water, cyanide, process liquors and/or tailings are either: (a) equipped with telemetry systems and pressure sensors along pipelines to allow the detection of leaks and failures; or (b) equipped with automatic cut-outs in the event of a pipe failure; and/or (c) provided with secondary containment sufficient to contain any spill for a period equal to the time between inspections **Condition 1.2.7** Undertake daily visual inspections of tailings delivery and return pipelines.
	Overtopping of TSF K		• The licence holder will operate the TSF in accordance with the design requirements. Additionally, the licence holder will continue to implement the existing controls: **Condition 1.2.3** Maintain a minimum freeboard total freeboard of 500 mm (operational + beach) **Condition 1.2.7** Undertake visual inspections to confirm the required freeboard capacity is available.
Decant water containing cyanide	Decant pond	Access of fauna to the decant pond	• Deterring techniques will be used when frequent wildlife visitations are noted during inspections. The licence holder will continue to implement the following existing controls: **Condition 1.2.7** Daily visual monitoring and recording of any wildlife visitation.
Operations of the Golden Age in-pit TSF			
Dust from dry tailings deposition	Deposition of tailings following the construction of the	Airbourne / Wind dispersion	• Tailings will be kept at a slurry density between 38 and 45% when discharging

Emission	Sources	Potential pathways	Proposed controls
	two embankment raises		• Daily inspections will occur to monitor dust generation within the TSF • Vegetation surrounding the TSF will be regularly monitored for any impacts from dust generation
Noise		Airbourne / Wind dispersion	The licence holder has not proposed any additional controls however; it is anticipated that the controls proposed during the construction activities will also apply to the operations of the TSF. Noise is regulated under the *Environmental Protection (Noise) Regulation 1997.*
Leachate		Vertical infiltration and horizontal migration	• One additional groundwater monitoring bore will be constructed (GAMB1) and the existing monitoring program will be extended to this bore • A 6 monthly review of seepage will be undertaken to determine whether the construction of recovery bores in the proximity of the pit is required • An assessment of the drill holes location will be undertaken using a ground penetrating radar and historical records will be updated • All exploration holes found will be sealed prior to the commencement of tailings deposition • Integrity testing and bore logging will be undertaken • Shotcrete will be applied where evidence shows that a potential drill hole is present • Tailings deposition points will be managed so that a subaerial beach is maintained in the northern pit area where the majority of potential exploration holes occur • A small decant pond throughout operations will be maintained • The licence holder will undertake a review of the existing geochemical data for the external ore / tailings and compare it to the Wiluna tailings to determine whether co-deposition can occur • Following the commencement of processing the licence holder will undertake further geochemical

Emission	Sources	Potential pathways	Proposed controls
			analysis to determine the environmental risk to receptors • If environmental risk is identified, the licence holder will stop the processing of the external ores. The licence holder will continue to implement the existing controls: **Condition 1.2.7** A daily visual assessment of the pond size and location. **Condition 1.2.11** A monthly water balance for each operational TSF **Condition 3.4.1** Quarterly monitoring of standing water level (target 6 meters mbgl and a limit of 4 mbgl are applicable), soluble arsenic (applicable limit of 0.4 mg / L), pH, total dissolved solids, weak acid dissociable cyanide, total cyanide. Annual monitoring of metal, metalloid and non-metal parameters. **Condition 3.4.2** The licence holder must cease discharge into the pit when there is an exceedance of the target level (6mbgl). Monitoring of the in-pit TSF groundwater bores must occur weekly until the standing water levels exceed the target stated.
Contaminated stormwater		Overland runoff and infiltration after a rainfall event	• The existing 2 m high abandonment bund will divert stormwater away from the pit. • Additional surface water diversions are currently in place.

Emission	Sources	Potential pathways	Proposed controls
Tailings slurry / supernatant water discharge	Pipeline leaks or rupture	Direct discharge to land and infiltration	• Pipelines will be constructed according to licence conditions (see below). • After construction, pipelines will be inspected according to licence conditions • Spills will be recovered and an incident will be recorded in the site incident management system. The licence holder will implement the existing controls: **Condition 1.2.6** The licence holder shall ensure that all pipelines containing alkaline water, saline water, cyanide, process liquors and/or tailings are either: (a) equipped with telemetry systems and pressure sensors along pipelines to allow the detection of leaks and failures; or (b) equipped with automatic cut-outs in the event of a pipe failure; and/or (c) provided with secondary containment sufficient to contain any spill for a period equal to the time between inspections. **Condition 1.2.7** Undertake daily visual inspections of tailings delivery and return pipelines.
Tailings slurry / supernatant water discharge	Overtopping	Direct discharge and infiltration	• The licence holder will operate the TSF in accordance with the design requirements. • The newly installed pump will be designed to maintain a minimum decant water return rate of 100 L / s with a peak rate of 125 L / sec (pump availability of 90%) • The integrity of the abandonment bund will be maintained • Inspection will be undertaken in accordance with the licence. The licence holder will continue to implement the existing controls: **Condition 1.2.3** Minimum freeboard of 500 mm total freeboard (operational + beach) at all

Emission	Sources	Potential pathways	Proposed controls
			times **Condition 1.2.7** Undertake visual inspections to confirm the required freeboard capacity is available
Decant water containing cyanide	Decant pond	Access of fauna to the pond	• Deterring techniques will be used when frequent wildlife visitations are noted during inspections. The licence holder will continue to implement the following existing controls: **Condition 1.2.7** Daily visual monitoring and recording of any wildlife visitation.

3.1.2 Receptors

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

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

Table 2: Sensitive receptors and distance from the prescribed activity

Human receptors	Distance from prescribed activity
Town of Wiluna	2.8 km from TSF and 2.7 km from the Golden Age In-pit TSF. Given the separation distances, it is unlikely that the residents will be affected by the activities. As an actual or likely source-pathway-receptor linkage does not exist, these receptors have not been considered further in this assessment.
Bondini Aboriginal Community	Approximately 1 km north-east of TSF K and 2.8 km north-east of Golden Age In-pit TSF. Given the separation distances, it is unlikely that the community will be affected by the activities. As an actual or likely source-pathway-receptor linkage does not exist, these potential receptors have not been considered further in this assessment.
Cultural receptors	**Distance from prescribed activity**
Tjanapi: A registered heritage place for creation/dreaming narrative (Place ID 2182)	900 m west of TSF K and 150m north of Golden Age In-pit TSF.

Cultural receptors	Distance from prescribed activity
Women's ceremonial track A registered heritage place for ritual/ceremonial purposes (Place ID 1370)	Within the premises boundary, adjacent to TSF K and 150 m north of the Golden Age In-pit TSF.
Women ceremonial site A registered heritage place for ritual/ceremonial purposes (Place ID1369)	400 m east for TSF K and approximately 2 km from the Golden Age In-pit TSF.
Red Hill: Registered Artefacts / Scatter Rock shelter (Place Id 2014)	1.4 Km from the Golden Age In-pit TSF. Given the separation distance, it is unlikely that this registered site will be affected by the activities. As an actual or likely source-pathway-receptor linkage does not exist, these potential receptors have not been considered further in this assessment.
Environmental receptors	**Distance from prescribed activity**
Surface water	
Lake Violet Salt encrusted lake, filled with comparatively fresh water during flooding.	Approximately 2 km south of both above ground and in-pit TSFs, bordering on premises boundary to the south.
Hydrography WA 250K Surface water lines – two ephemeral surface water lines	490 m and 1.4 km west of the Golden Age In-pit TSF
Groundwater	
Proclaimed East Murchison Groundwater area under the *Rights in Water and Irrigation Act 1914* (RIWI Act). Regional groundwater is typically saline to hypersaline (2,000 mg/L to 200,000+ mg/L) with lower salinity (500 – 2,000 mg/L) in isolated recharge cells associated with alluvial fans and calcrete systems. Depth to the groundwater varies. Before mining activities began depths varied between 10 meters below ground level (mbgl) in mining area, to approximately 2 mbgl close to Lake Violet. However, mine dewatering has resulted in some local depression where depth to the water table is approximately 100 mbgl. Groundwater abstraction licences are held by several mining/exploration companies around the Wiluna area including Water Corporation and the Shire of Wiluna.	Underlying the premises, including TSF K and Golden Age In-pit TSF.

Environmental receptors	Distance from prescribed activity
Fauna	
Up to 14 species of specially protected migratory birds Protection occurs under several international agreements	In the surrounding area
Merops ornatus (Rainbow Bee eater) and *Sminthopsis longicaudata* (long-tailed dunnart) The fauna is considered likely to occur	In the surrounding area
Macrotis lagotis Greater bilby	Sighted within a 3km radius of TSF K.
Dasycercus blythi (Brush-tailed mulgara) Vulnerable under the *Environmental Protection and Biodiversity Conservation Act 1999*.	Sighted within a 3km radius of TSF K.
Stygofauna assemblages The stygofauna include six priority ecological communities.	Within the Lake Violet calcrete system
Flora	
Native pre-European vegetation Mulga and other Wattle Atriplex species, Maireana species and a number of Acacia species. Remnant native vegetation at the premises is highly disturbed from ongoing mining activities.	Remnant native vegetation adjoins the northern, eastern, southern and western boundaries of TSF K and the southern west part of the Golden Age in-pit TSF.

3.2 Risk ratings

Risk ratings associated with the emissions from the proposed amendment have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020). As identified in section 3.1 each identified emission source considers a potential source-pathway-receptor linkage. Where linkages are incomplete, they have not been considered further in the risk assessment.

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

Additional regulatory controls may be imposed where the applicant's controls are not deemed sufficient. Where this is the case, a justification will be provided in Table 3.

The revised licence that accompanies this amendment report authorises emissions associated with the operation of the premises.

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

Table 3. Risk assessment of potential emissions and discharges from the premises

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence holder's controls sufficient?	Conditions[2] of licence	Decision and justification for additional regulatory controls (when required)
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
Construction								
Construction of TSF K embankment lifts, including earthworks and mobilisation and positioning of infrastructure associated with both TSF K and Golden Age in-pit TSF	Dust	**Pathway:** Air/windborne pathway **Impact:** Reduction in vegetation health	Native vegetation	Refer to Section 3.1	C = Minor L = Unlikely **Medium Risk**	Y	Condition 1.2.1	It is not expected that sensitive receptors will be significantly impacted by dust emissions from construction activities, given the licence holder proposed controls and the length of the construction phases. The risk rating has been deemed to be medium with a *minor* consequence and an *unlikely* likelihood ratings. Licence holder's controls have been conditioned within the amended licence in accordance with DWER Guideline: Risk Assessments (DWER 2020). No additional regulatory controls are required.
	Noise / Vibrations	**Pathway:** Air/windborne pathway **Impact:** Impact to amenity	Aboriginal heritage sites (for ceremonial purposes)	Refer to Section 3.1	C = Minor L = Rare **Low Risk**	Y	N/A	Given the temporary nature of construction activities and the applicant's proposed controls, the risk event rating is deemed to be *low* from a *minor* consequence and a *rare* likelihood ratings. The general provisions of the EP Act and the *Environmental Protection (Noise) Regulations 1997* are considered sufficient to regulate noise emissions.
	Contaminated stormwater following a rainfall event	**Pathway:** overland runoff and infiltration **Impact:** Ecological disturbance including contamination of soil and surface water	Surface water, soil and native vegetation	Refer to Section 3.1	C = Minor L = Unlikely **Medium Risk**	Y	N/A	The licence holder did not specifically address the risks associated with contaminated stormwater during the construction activities at the premises. Nonetheless, some existing stormwater contamination control measures including stormwater diversions will contribute to lower the risk to sensitive receptors. Given the temporary nature of construction and the overall semi-arid climate at the premises, the Delegated Officer has deemed the risk event to be *medium* as a result of a *minor* consequence and an *unlikely* likelihood

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence holder's controls sufficient?	Conditions[2] of licence	Decision and justification for additional regulatory controls (when required)
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
								ratings. No additional regulatory controls have been deemed necessary.
Operations								
TSF K								
Deposition of tailings following the construction of the two additional embankment raises	Tailings dust containing elevated concentrations of arsenic	**Pathway:** Air/windborne pathway **Impact:** Degradation of vegetation health, soiling and discoloration	Native vegetation	Refer to Section 3.1	C = Moderate L = Unlikely **Medium Risk**	Y	Condition 1.3.3 Condition 2.1.3	Solids concentration in tailings slurry is expected to be approximately 38 – 45% during deposition, therefore, dust emissions are not expected to occur during this stage. However, as tailings settle and consolidate in the above ground TSF, the likelihood of dust generation will increase as the moisture content will decrease (1.35 tonnes / cubic meters maximum dry density). An outcome-based condition was included in the 2024 licence amendment to ensure that dust emissions beyond the premises are minimised and the overall risk of impact to receptors remains acceptable. This condition, together with the applicant's proposed controls, have been deemed sufficient to maintain the risk acceptable. The risk rating has been deemed *medium* as a result of a *moderate* consequence and a *unlikely* likelihood ratings. Licence holder's controls have been conditioned within the amended licence in accordance with DWER Guideline: Risk Assessments (DWER 2020).
	Contaminated stormwater following a rainfall event	**Pathway:** overland runoff and infiltration **Impact:** ecological disturbance including	Soil Native vegetation Surface water Groundwater	Refer to Section 3.1	C = Minor L = Possible **Medium Risk**	Y	Condition 1.2.1	Existing measures to control and divert contaminated stormwater will continue to be used at the premises. The Delegated Officer notes that a stormwater diversion drain extension was to be constructed as part of the second raise, however, due to the lack of materials availability, this piece of

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence holder's controls sufficient?	Conditions[2] of licence	Decision and justification for additional regulatory controls (when required)
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
		contamination of soil and surface water						infrastructure is still outstanding and remains a licence condition to be met (1.2.1, item 2). The licence holder must construct the stormwater diversion drain associated with Stage 2 embankment raise as soon as possible and before Stage 3 raise operations commence. The risk event rating has been deemed *medium* as a result of a *minor* consequence and a *possible* likelihood ratings. The Delegated officer has determined the existing conditions on the licence and the licence holder proposed controls are sufficient in managing the risk of contaminated stormwater to sensitive receptors.
	Tailings seepage (high in salt, heavy metals and metalloids concentrations)	**Pathway:** vertical infiltration and horizontal migration **Impact:** groundwater mounding, groundwater contamination and potential ecological disturbance	Groundwater and native vegetation	Refer to Section 3.1	C = Moderate L = Possible **Medium Risk** Refer to section 3.3	N	Condition 1.2.1 Condition 1.3.3 **Condition 1.3.5** Condition 1.3.9 Condition 1.3.10 Condition 3.4.1 Condition 4.1.1	Refer to section 3.3 for a detailed risk assessment on seepage.
	Tailings seepage (toll treated ores)	**Pathway:** vertical infiltration and horizontal migration **Impact:** groundwater contamination	Groundwater and native vegetation	Refer to Section 3.1	C = Minor L = Unlikely **Medium Risk**	N	Condition 1.3.6 **Condition 5.2.1**	The inclusion of treated ores of unknown geochemical properties in the operational TSF will introduce a risk of additional contaminants reaching groundwater through seepage. Furthermore, it is unclear how the different tailings streams (existing and toll treated) will interact from a geochemical perspective, once deposition occurs. Nonetheless, the proportion of the toll treated ores will be small in comparison to the Wiluna

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence holder's controls sufficient?	Conditions[2] of licence	Decision and justification for additional regulatory controls (when required)
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
								ores. Additionally, the Delegated Officer finds that the proposed mitigation measures, including ongoing geochemical analysis of the new tailings' streams and any potential interaction, and the ceasing of operations if an environmental risk is identified, will lower the risk of any detrimental effects occurring to surrounding receptors. Licence holder's controls have been conditioned within the amended licence in accordance with DWER Guideline: Risk Assessments (DWER 2020). To ensure compliance with the above licence requirement, the Delegated Officer has included a reporting condition requiring that the results of such analyses are submitted as part of the AER. The risk rating has been deemed as *medium* as the consequence has been deemed *minor* and the likelihood *unlikely*.
	Tailings slurry / supernatant water discharge	**Pathway:** Overtopping, resulting in direct discharge and infiltration **Impact:** Ecological disturbance and contamination of soil	Soil Native vegetation Surface water	Refer to Section 3.1	C = Moderate L = Unlikely **Medium Risk**	Y	Condition 1.3.3 Condition 1.3.9	Existing controls on the licence are adequate for managing the risk of overtopping resulting in ecological disturbance and contamination of soil. No additional regulatory controls have been deemed necessary. The Delegated Officer has deemed the risk event to be *medium* as a result of a *moderate* consequence and an *unlikely* likelihood ratings.
	Tailings slurry Supernatant water discharge	**Pathway:** Pipeline failure, resulting in direct discharge, runoff and	Soil Native vegetation Native fauna, including	Refer to Section 3.1	C = Moderate L = Unlikely **Medium Risk**	Y	Condition 1.3.8 Condition 1.3.9	Existing controls on the licence are adequate for managing the risk of pipeline failure resulting in leaks and spills. No additional regulatory controls have been deemed necessary. The Delegated Officer has deemed the risk

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence holder's controls sufficient?	Conditions[2] of licence	Decision and justification for additional regulatory controls (when required)
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
		infiltration **Impact:** Ecological disturbance, including impact to avifauna health, and contamination of soil	avifauna					event to be *medium* as a result of a *moderate* consequence and an *unlikely* likelihood ratings.
Operations of the supernatant pond	Supernatant water (possibly containing CN and high salinity)	**Pathway:** direct access through the ingestion of supernatant water **Impact:** deterioration of avian health	Avifauna	Refer to Section 3.1	C = Moderate L = Possible **Medium Risk**	Y	Condition 1.3.9 **Condition 3.3.1**	The licence holder currently discharges tailings decant water into an engineered HDPE lined pond (containment point C2D on the licence) for reuse at the processing plant. Condition 3.4.1 requires the licence holder to monitor this pond for pH and Arsenic weekly (monitoring point reference PM3). Cyanide is used in processing activities at the premises, as such, it is expected that decant water discharged in this pond contains cyanide in some concentration. The Delegated Officer notes the presence of 14 species of protected birds in the vicinity of the premises. Ingestion of cyanide containing mine water may pose a potential lethal risk to local avifauna. As monitoring of TDS at the lined pond currently does not occur, it is impossible to determine how palatable the mine water is to the surrounding avifauna. To monitor the ongoing risk to birds at PM3, the Delegated Officer has deemed it necessary to add the monitoring of salinity (TDS as mg / L) and cyanide concentrations to the licence. Taking into consideration the additional monitoring, the risk event has been deemed *medium* with a *moderate* consequence and a *possible* likelihood.

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence holder's controls sufficient?	Conditions[2] of licence	Decision and justification for additional regulatory controls (when required)
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
Golden Age in-pit TSF								
Deposition of tailings into Golden Age in-pit TSF	Tailings dust containing elevated concentrations of arsenic	**Pathway:** Air/windborne pathway **Impact:** Degradation of vegetation health, soiling and discoloration	Native vegetation	Refer to Section 3.1	C = Moderate L = Unlikely **Medium Risk**	Y	Condition 1.3.3 Condition 2.1.3	As for TSF K, solids concentration in tailings slurry is expected to be approximately 38 – 45% during deposition into the Golden Age In-pit TSF, therefore, dust generation during deposition is not expected. However, as for TSF K, during the rest period, dry density will increase from approximately 0.54 to 1.25 tonnes / cubic meter raising the likelihood of the risk event. Noting the proposed and existing controls and that the dry density of tailings will remain below that of tailings stored into TSF K, the risk event rating has been deemed as *medium* as a result of a *moderate* consequence and an *unlikely* likelihood ratings. Licence holder's controls have been conditioned within the amended licence in accordance with DWER Guideline: Risk Assessments (DWER 2020). No additional regulatory controls are required
	Contaminated stormwater following a rainfall event	**Pathway:** overland runoff and infiltration **Impact:** **e**cological disturbance including contamination of soil and surface water	Soil Native vegetation Surface water Groundwater	Refer to Section 3.1	C = Minor L = Rare **Low Risk**	Y	Condition 1.3.3	Existing and proposed controls have been deemed sufficient and have been conditioned within the amended licence in accordance with the department *Guideline: Risk Assessments (2020).* No additional regulatory controls have been added to the licence specifically for the Golden Age in-pit TSF. The Delegated Officer has deemed the risk event to be *low* as a result of a *minor* consequence and a rare likelihood ratings.
	Tailings seepage (high	**Pathway:** vertical	Groundwater and native	Refer to	C = Moderate	N	Condition 1.2.1	Tailings disposed of, in the Golden Age in-pit TSF will have the same geochemical

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence holder's controls sufficient?	Conditions[2] of licence	Decision and justification for additional regulatory controls (when required)
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
	in salt, heavy metals and metalloids concentrations)	infiltration and horizontal migration **Impact:** groundwater mounding, groundwater contamination and potential ecological disturbance	vegetation	Section 3.1	L = Unlikely **Medium Risk**		Condition 1.3.3 Condition 1.3.9 Condition 1.3.10 Condition 3.4.1 Condition 3.4.2	composition as those of TSF K. A geochemical assessment of the different tailings' streams currently disposed of at the premises showed that the quality of decant water leaving the pit to seepage will be unacceptable to the surrounding environment (Rockwater, 2024). Seepage at the Golden Age in-pit TSF is expected to occur during the latter stages of deposition as the volume of tailings deposited increases to above the height of the saturated zone surrounding the pit (Rockwater, 2024). This risk is increased by the potential transmission of tailings slurry directly underground and to the groundwater aquifers should one or more exploration holes not be located or sealed appropriately. The Delegated Officer has: • Conditioned the proposed mitigation measures related to the existing exploration holes to limit potential transmission • Conditioned the construction and operation of the additional monitoring bore to the west of the in-pit TSF(GAMB1) to monitor seepage • Conditioned the operations of the in-pit TSF including the size of the decant pond Licence holder's controls have been conditioned within the amended licence in accordance with DWER Guideline: Risk Assessments (DWER 2020). Additionally, the Delegated Officer has: • Maintained the groundwater monitoring program associated with the in-pit TSF

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence holder's controls sufficient?	Conditions[2] of licence	Decision and justification for additional regulatory controls (when required)
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
								• Maintained the inspection program associated with the in-pit TSF • Maintained a requirement for a monthly water balance to be reported on active TSFs • Extended the limit on the concentration of weak acid dissociable cyanide to the groundwater monitoring surrounding this TSF consistent with TSF K • Maintained the management action of condition 3.4.2 when limits are exceeded Noting the proposed mitigation measures, the Delegated Officer has deemed the risk rating to be *medium* as a result of a *moderate* consequence and an *unlikely* likelihood ratings.
	Leachates from toll treated ores	**Pathway:** vertical infiltration and horizontal migration **Impact:** groundwater contamination	Groundwater and native vegetation	Refer to Section 3.1	C = Minor L = Unlikely **Medium Risk**	Y	Condition 1.3.6 **Condition 5.2.1**	The inclusion of treated ores of unknown geochemical properties in the operational TSF will introduce a risk of additional contaminants reaching groundwater through seepage. This may have a detrimental effect on the native vegetation surrounding the TSF. Furthermore, it is unclear how the different tailings streams (existing and toll treated) will interact from a geochemical perspective, once deposition occurs. Nonetheless the proportion of the toll treated ores will be small in comparison to the Wiluna ores. Additionally, the Delegated Officer finds that the proposed mitigation measures, including ongoing geochemical analysis of the new tailings' streams and any potential interaction, and the ceasing of operations when an environmental risk is identified, will lower the risk of any detrimental effects occurring to surrounding receptors. Licence holder's controls have been

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence holder's controls sufficient?	Conditions[2] of licence	Decision and justification for additional regulatory controls (when required)
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
								conditioned within the amended licence in accordance with DWER Guideline: Risk Assessments (DWER 2020). To ensure compliance with the above licence requirement, the Delegated Officer has included a reporting condition mandating that the results of such analyses are submitted as part of the AER. Risk rating has been deemed as *medium* as the consequence has been deemed *minor* and the likelihood *unlikely*.
	Tailings slurry Supernatant water discharge	**Pathway:** Overtopping, resulting in direct discharge and infiltration **Impact:** Ecological disturbance and contamination of soil	Soil Native vegetation Surface Water	Refer to Section 3.1	C = Moderate L = Unlikely **Medium Risk**	*Y*	Condition 1.3.3 Condition 1.3.9	The licence holder proposed controls and those existing on the licence including the enforcement of a freeboard, daily inspections of the freeboard and the construction of an abandonment bund have been deemed sufficient to maintain an acceptable level of risk. No additional regulatory controls have been deemed necessary. The risk event has been deemed as medium as a result of a *moderate* consequence and an *unlikely* likelihood ratings.
	Tailings slurry Supernatant water discharge	**Pathway:** Pipeline failure, resulting in direct discharge, runoff and infiltration **Impact:** Ecological disturbance, including impact to avifauna health, and contamination of soil	Soil Native vegetation Native fauna, including avifauna	Refer to Section 3.1	C = Moderate L = Unlikely **Medium Risk**	Y	Condition 1.3.8 Condition 1.3.9	A potential risk of discharge of tailings slurry or return water to the environment through pipeline failure between the in-pit TSF and the processing plant could impact the health of nearby native vegetation. However, taking into consideration that the pipeline route will be located on disturbed ground and will comply with existing pipeline requirements, including automatic cut-outs or containments sufficient to contain any spills, the Delegated Officer finds that the risk of discharge to surrounding receptors is acceptable. Controls on the licence are sufficient to manage the risk. No additional regulatory controls are required.

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence holder's controls sufficient?	Conditions[2] of licence	Decision and justification for additional regulatory controls (when required)
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
								The Delegated Officer has deemed the risk rating as medium as a result of a moderate consequence and an unlikely likelihood ratings.
Operations of the supernatant pond	Supernatant water (high metal concentration and high salinity)	**Pathway:** direct access through the ingestion of supernatant water **Impact:** deterioration of avian health	Avifauna	Refer to Section 3.1	C = Moderate L = Possible **Medium Risk**	N	Condition 1.3.9 **Condition 3.3.1**	The licence holder currently discharges the tailings decant water into an engineered HDPE lined pond (referred to as containment point C2D on licence) to be reused at the processing plant. Condition 3.4.1 requires the licence holder to monitor this pond for pH and Arsenic weekly (monitoring point reference PM3). Given the processes occurring at the premises that include the use of cyanide, the mine water could potentially be lethal to the avifauna surrounding the premises. Noting that there are 14 species of protected birds surrounding the premises, with the current monitoring, it is currently not possible to determine how palatable the mine water the avifauna as no salinity monitoring is currently occurring. To monitor the ongoing risk to birds, the Delegated Officer has deemed it necessary to include salinity (TDS as mg / L) and cyanide to the monitoring of PM3. Taking into consideration the additional monitoring, the Risk event has been deemed *medium* with a *moderate* consequence and a *possible* likelihood.

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk assessments* (DWER 2020).
Note 2: Proposed licence Holder's controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

3.3 Detailed risk assessment – seepage of leachates from TSFK

3.3.1 Overview of the risk event

Seepage from the base and the sides of a TSF embankment is a key risk in mining operations. Seepage can result in instability of the dam walls, groundwater contamination through the infiltration of high concentrations of salts, metals and metalloids, and groundwater mounding when the infiltration of water causes the groundwater table to rise.

Impacts from seepage include:

- detrimental effect on vegetation health from the exposure of the root zone to hypersaline conditions
- detrimental effect and death of native vegetation due to extended root exposure to saturated condition
- rehabilitation issues due to the salinisation of shallow sub surfaces
- potential increased risk of groundwater pollution due to a reduced thickness of unsaturated zone
- migration of contaminants in groundwater outside the area of the mine affecting any potential users.

This detailed risk assessment will assess the potential for an increase in seepage from TSF K after the construction of Stage 3 and Stage 4 raises.

3.3.2 Source

Tailings geochemistry

TSFs K will store a mix of oxide, historic, toll treated and sulphide tailings. As mentioned in section 2.1 of this amendment report, the Delegated Officer notes that the Sulphide plant is currently not operating and, as stage 2 construction of the plant was never assessed for compliance, sulphide tailings storage remains outside the scope of this amendment report.

Several geochemical assessments were undertaken at the premises between 2016 and 2023, describing the chemical properties of the different tailings' streams found at the premises. A brief summary of the most relevant studies is shown below:

- 2019 – Geochemical characteristics of oxide tailings were assessed to determine the suitability of the material for construction purposes (TSF K). Tailings were generated from a pilot trial and considered to be representative of all oxide tailings at the premises. The study showed that:
    - Oxide tailings were non-acid forming (NAF). They had an overall excess neutralisation capacity compared to acid generation potential. The acid neutralisation capacity was mainly attributed to carbonate minerals with a small portion attributable to less available non-carbonate minerals.
    - LEAF testing indicated that most metals would leach the most at the lowest pH tested (2 pH unit), with arsenic also leaching the most under highly alkaline conditions (14 pH unit). At the lowest pH, concentrations of aluminum, cobalt (Co) and lead (Pb) would exceed the Australian and New Zealand Guideline for fresh and Marine Water Quality (ANZG) based on livestock drinking water. At the time of deposition, it was expected that pH would not be as low as pH 2 nor as high as pH 14.
    - Where the tested pH was between 4 and 12, leaching of metals remained within the ANZG livestock drinking water guidelines.

- Based on slurry sampling, seepage quality in the early stages of deposition was predicted to be moderately alkaline (pH 9-9.4) and saline (electrical conductivity above 18,000 µS/cm) with high concentrations of sulfate (up to three times those recommended under the ANZG livestock drinking water guidelines).
- Tailings supernatant analysis was also conducted and was consistent with the above, showing an overall alkaline pH, with a high level of salinity. High concentrations of the major ions were also detected including sulfate, calcium, chlorine and sodium. Sulfate content was between two to three times the ANZG livestock drinking water guidelines in the sample analysed. Copper (Cu) exponentially exceeded the ANZG livestock drinking water guidelines in all samples tested at pH 9, likely caused by cyanide complexation. However, these concentrations were not expected to seep through the TSF due to attenuation processes and cyanide breakdown over time.

- 2021 – A geochemical study was undertaken to assess different tailings streams including flotation tailings (sulphide flotation plant – outside the scope of this amendment), historic tailings from the Wiltails plant and any possible interactions from the combined Wiltails and flotation tailings. The purpose of the study was to determine any risk of acid mine drainage, saline or neutral drainage to the environment. The study showed that:
  - Flotation, historic (Wiltails) and blended tailings were mostly made of carbonate minerals, quartz, chlorite, feldspar, illite / mica and paragonite. The pressure oxidation leach residue mainly consisted of sulfate bearing minerals quartz, feldspar, illite / mica and calcite.
  - All samples were considered NAF, based on a negative Net Acid Production Potential value and a neutral to alkaline Net Acid Generation pH value.
  - Based on decant water sampling, seepage quality in the early stages of deposition was predicted to be alkaline (pH 7.9 - 8.6). Salinity varied widely with the lowest concentration being that of flotation tailings (571 mg/L) and that highest, that of historic tailings (6,766 mg/L), exceeding ANZECC and ARMCANZ (2000) guidelines for livestock drinking water quality. Wiltails and blended tailings had a significantly higher concentration of sulfate, chloride, calcium, magnesium and sodium compared to the flotation tailings. All tailings' streams had a low concentration of trace elements including arsenic, cobalt, total and free cyanide.
  - Water leach results showed that pH was between 6.7 and 7.9, salinity was between 54 and 1,400 mg/L and within the guidelines for livestock drinking water for all tailings streams. Arsenic exceeded livestock drinking water guidelines in 3 of 4 tailings samples including the reprocessed historic tailings. Cyanide was present in three of four samples with one sample containing free cyanide. The free cyanide concentration in the sample was below the Non-Potable Use Groundwater guideline (0.8 mg / L).

Toll tailings

As mentioned earlier in this report, while not explicitly requested as part of this licence amendment, the licence holder stated that toll treated ores may potentially become part of the ongoing operations at the premises. The tailings from the processing of the toll treated ores will be deposited into the operational TSFs. Geochemistry of tailings is currently unknown, and analysis will be undertaken at the premises to determine that they are geochemically compatible with the existing tailings. Should the analysis indicate that the tailings geochemistry may pose a risk to environmental receptors as a virtue of seepage or through any other pathway, deposition of these tailings will cease.

3.3.3 Pathway

TSF K Seepage and water balance

A 2-dimensional finite element analysis was used to determine the height of the saturated zone for the maximum crest levels after Stage 3 and 4 raises construction. Assumptions of the seepage analysis included a maximum pond level of 0.5 m below the crest level, and standard operations, where the decant pond radius was below 100 m. Predicted daily seepage volumes results, after deposition are shown in Table 4. The total seepage column shows the daily seepage volume resulting from the dam floor and sides of the embankment.

Table 4. Seepage estimates for the operations of TSF K after the raises construction

Stage of embankment	Approximate perimeter embankment total length (m)	Seepage flow (m^3/day/m of embankment)	Estimated seepage per day (m^3/day) along embankment perimeter	Estimated seepage from dam floor (m^3/day)	Total seepage outflow (m^3/day)	Total seepage outflow (m^3/year)
3	3420	$2.5x10^{-4}$	0.8	70.8	71.6	*2,6134*
4	3350	$3.0x10^{-4}$	1.0	70.8	72.3	*2,6389*

The annual average water return as a percentage of slurry water inflow was estimated to be approximately 54% per year in average climatic conditions, where approximately 52% was derived from the volume of return water available. Table 5 shows the calculated water balance for operations after the construction of stage 3. Estimations provided were the same for Stage 4 embankment raise operations.

Table 5. Water balance for TSF K stage 3 and 4 embankments raise

Inflows (m^3)		Outflows(m^3)	
Slurry water	4,155,544	Evaporation	491,261
Rainfall	86,236	Evapo-transpiration	132,878
Other	0	Seepage	26,151
		Held in tailings	1,360,000
		Return Water	2,231,490
Total	*4,241,780*	Total	*4,241,780*

TSF K historical information: 2024/25 licence amendment

In 2024 the licence holder submitted a licence amendment application under part V of the EP Act. During the assessment of the application, the department learnt that the licence holder had yet to submit an Environmental Compliance Report (ECR) on the construction of TSF K Stage 2 embankment raise. Compliance issues during the assessment of the ECR, combined with a notable seepage incident in 2024 and a dramatic increase in seepage (from 29,000 to 224,000 cubic meters) during the 2023 reporting period, prompted the department to include and incorporate a DWER initiated amendment during the processing of the licence holder requested amendment. The purpose of the DWER initiated amendment was to determine whether the existing controls were still effective in managing the risk of seepage in the area to the south of

the TSF, following the construction of Stage 2 embankment raise.

The following issues were discussed:

- Malfunction of the decant recovery pump in April 2024.

  The delayed resolution of this issue resulted in seepage permeating through the toe drain at the south embankment. This led to visible stress and death of the vegetation adjacent to the TSF.

- Dramatic increase in seepage during the 2023 reporting year.

  In the 2023 reporting year, yearly deposition of tailings doubled to 3,040,745 on the 2022 volume. Monthly decant water recovered was reported to be between 6 and 21% of the tailings' slurry deposited, with a monthly average of 15%. The pond radius was reported to be approximately 250m throughout the year. This resulted in a total calculated seepage loss of approximately 1,365,000 m^3 compared to 383,000 $m^3$the previous year.

- Review of standing water level monitoring at the groundwater bores surrounding the TSF.

  Standing water levels from quarter two of 2020 to quarter three of 2024 showed that groundwater levels had steadily increased in the south side of the TSF particularly to the southeast. Additionally, both groundwater bores had breached the 4 mbgl imposed by condition 3.4.1 of the licence. TD20K, located to the southwest of the TSF, had breached the limit in quarter two of 2024, with quarter one and quarter three showing a reading of 4.33 and 4.50 mbgl respectively. TD19K, to the southeast, breached the limit from quarter four of 2023 to quarter three of 2024.

The DWER initiated assessment concluded that regulatory controls on the licence were insufficient to maintain an acceptable level of risk, and that conditions outlining specified actions (in accordance with *Guideline: Risk event, 2020*) were necessary. Specified action (under condition 4.1.1) included:

- Undertake and submit a groundwater mounding characterisation and monitoring bore review prior to 11 September 2025
- Undertake and submit a groundwater management plan prior to 11 September 2025.

Additionally, a target level of 6mbgl was added under condition 3.4.1. The target was consistent with other groundwater bores at the premises.

The licence amendment was granted in March 2025. Requirements of condition 4.1.1 have not yet been met at the time of this report.

TSF K new information

Since the above assessment, the licence holder submitted a further Annual Environmental Report (AER) for the 2024 reporting year, as required by the licence. The total seepage reported for the year was calculated at just under 2 million cubic metres, a further increase of 30% on the 2023 volume. The total decant water recovered was approximately 1,114,000 cubic metres. Monthly water recovery from the TSF varied widely, between 8 and 37%, with a yearly average of 24%. As a result, pond radius also varied but measured on average approximately 166 meters.

Predictably, groundwater levels at the monitoring bores affected by seepage (TD19K and TD20K) continued to be high in quarter four of 2024. Depth to groundwater was 2.29 and 4.33 mbgl at the southeast (TD19K) and southwestern (TD20K) bores respectively. Furthermore, additional monitoring undertaken in February 2025 showed these groundwater levels persisting, with readings of 2.28 mbgl at TDK19 and 4.82 mbgl at TD20K.

The Delegated Officer also notes that groundwater quality also appears to be affected by the high volumes of seepage. When comparing water quality upstream and downstream of the TSF

the AER showed that concentrations of several parameters in the monitoring bores to the south of the TSF were much higher (sometimes exponentially higher) than those located to the north. Parameters in higher concentrations included Sodium, Calcium, Potassium, Total dissolved solids, Magnesium, Chloride, Strontium and Sodium.

Figure 11 shows how the volumes of tailings slurry deposited, decant water recovered and the pond radius vary between 2021 (beginning of deposition) and 2024. The figure is based on the data provided by the licence holder as part of the annual reporting requirements, with the decant pond radius extrapolated from the data provided.

Figure 12 compares the calculated monthly seepage reported on the yearly groundwater balance and the seepage estimation provided as part of this proposed amendment during operations of the TSF at the highest crest level. A logarithmic scale (power of 10) was used due to the wide-ranging difference between the calculated monthly seepage and that estimated as part of this amendment. Only estimated seepage for stage 4 embankment was included, given that seepage for stage 3 and 4 were very similar. Gaps in the figure represent unreported data in the yearly groundwater balance.

Figure 13 shows the standing water level overall increase between 2020 and 2025 with the groundwater bores to the south of the TSF breaching the limits on the licence starting from 2023.

Figure 14 shows a comparison of the data presented by the licence holder for the 2024 reporting year at the different bores surrounding the TSF.

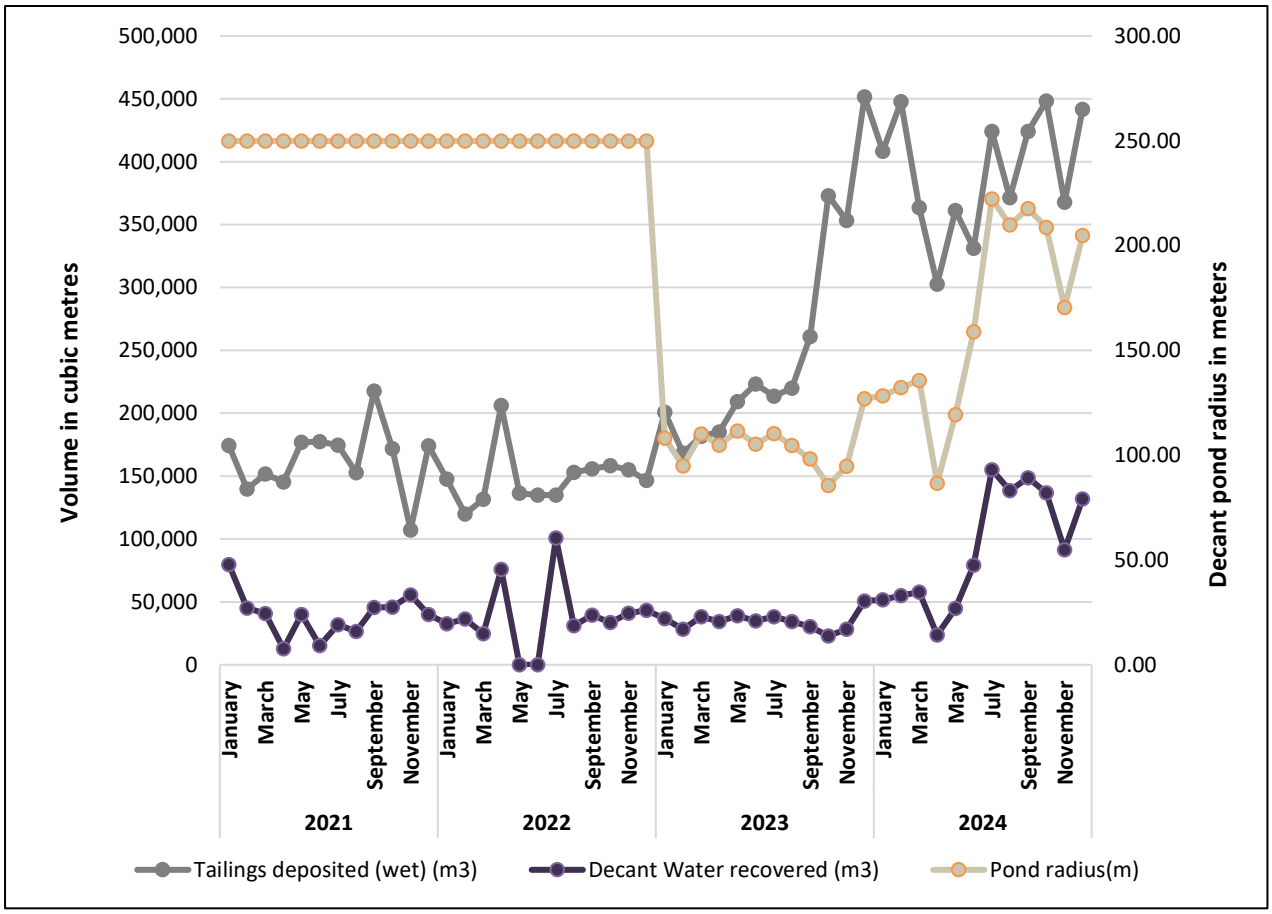


Figure 11. Volume of tailings deposited, decant water recovered and pond radius over time

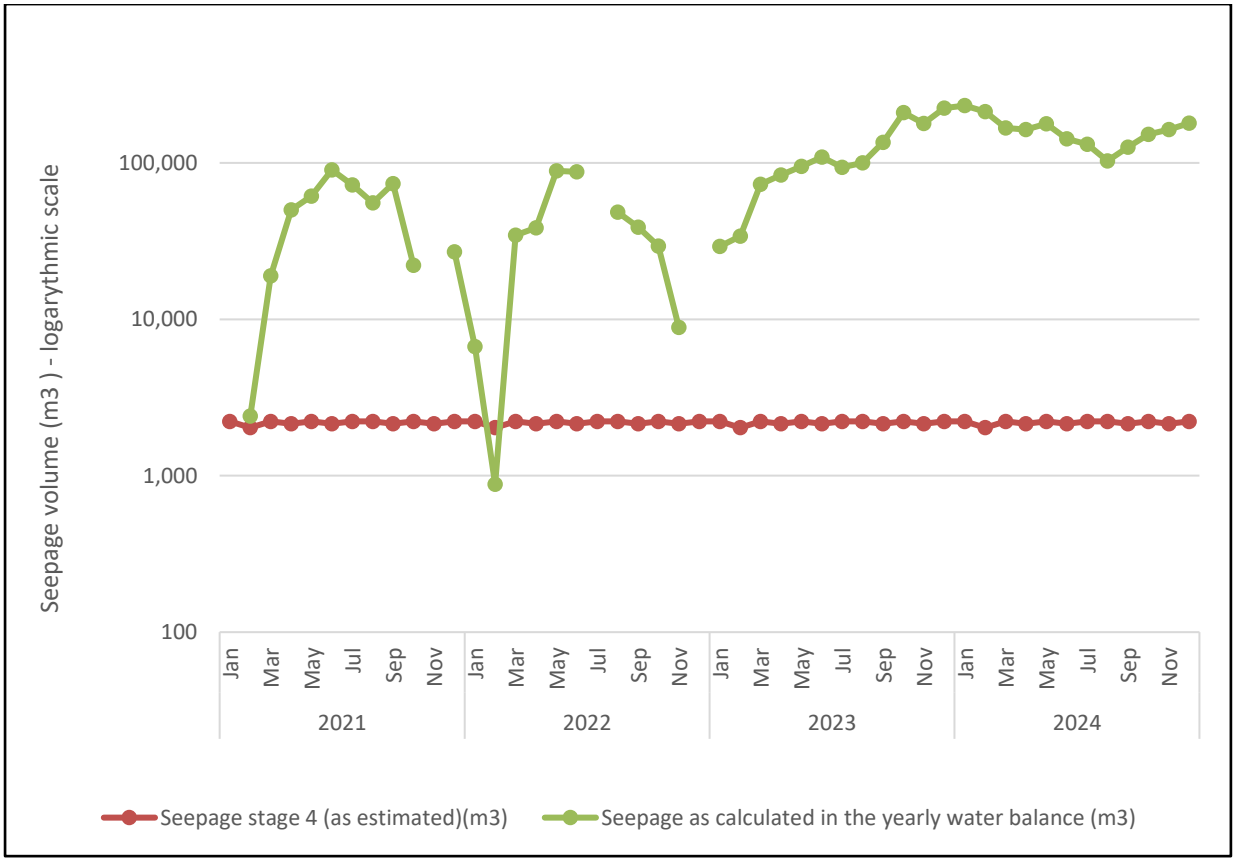


Figure 12. Volume of seepage from yearly water balance as reported versus volume of seepage estimated during the operations of TSF K at Stage four construction height

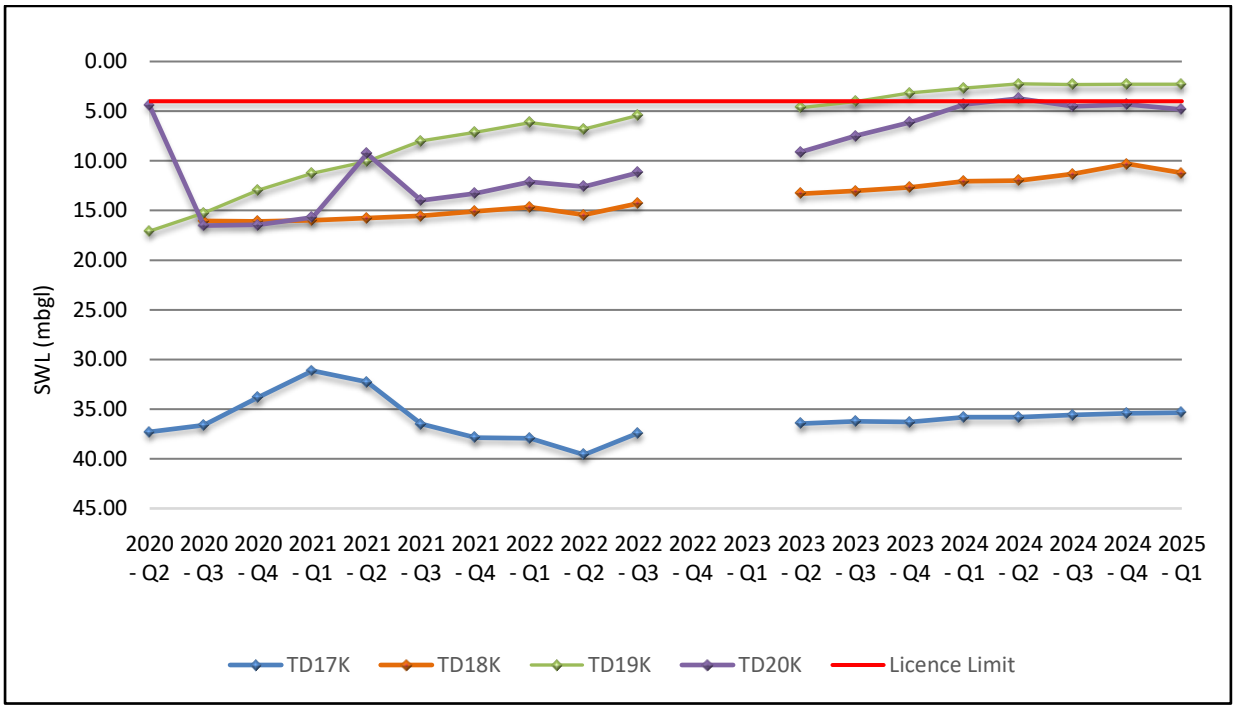


Figure 13. Standing water levels between 2020 and 2025 at TSF K groundwater bores

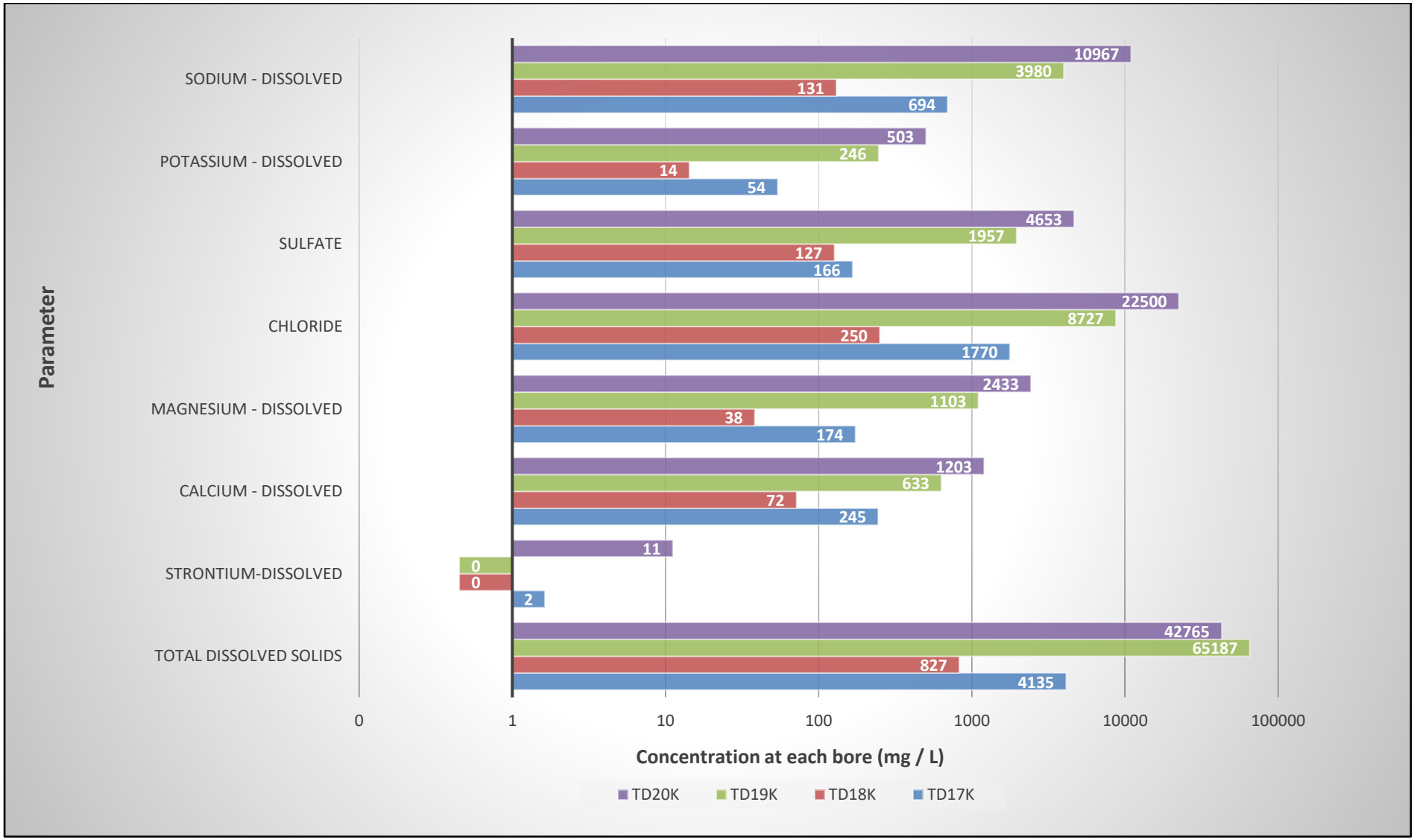


Figure 14. Comparison of concentration of some of the parameters in groundwater at the TSF K monitoring bores

3.3.4 Risk rating and regulatory controls

During the DWER initiated amendment in 2024/25, specified actions (listed earlier in this report) were added to the licence. These were deemed necessary to maintain an acceptable level of risk associated with the seepage and the potential detrimental effect on surrounding vegetation and groundwater. After the specified actions were taken into consideration, the risk rating was deemed to be *medium*, with a *moderate* consequence and a *possible* likelihood rating.

The information submitted on the proposed raises estimates a yearly seepage rate of approximately 26,100 cubic meters, during operations of the TSF, after stage four raise construction. When compared to the rate of seepage reported as part of annual reporting requirements, this appears to be a gross underestimation. Except 2022, seepage rates increased year on year in line with the increased volume of tailings slurry deposited and peaked at 2 million cubic metres in the last reporting period. Given the continued operations of the TSF after the construction of the additional raises, this trend is likely to continue. It is noted that the proactive management of the decant water recovery is key to maintaining low rates of seepage. The TSF K design report referred to standard operations as having a maximum decant pond radius of 100 m. Decant pond radii for 2023 and 2024 were 250 and 166 m respectively. This suggests that better management of the decant pond must be undertaken to achieve lower seepage rates.

Notwithstanding, as shown above, high standing water levels were persisting at the end of 2024, and at the beginning of 2025 indicating that seepage surrounding TSF K continues to be an issue. Furthermore, the seepage appears to be highly saline. This increases the risk of detrimental effects to the surrounding vegetation through roots exposure to conditions of water logging and high concentrations of salts. The Delegated Officer therefore deems it necessary to raise the likelihood of the risk event to *likely* as the longer groundwater level is raised beyond the limit on the licence (and the 6 m target), the more likely it is that the surrounding vegetation will be impacted by this exposure. As previously determined, the consequence of the risk event is *moderate* (as receptors have not changed), meaning that the risk event rating is now deemed to be *high*.

3.3.5 Additional controls

The submission of a groundwater mounding characterisation and monitoring bore review and a groundwater monitoring plan as required by the specified actions of condition 4.1.1, will inform the department on how the licence holder intends to address the ongoing seepage issues associated with TSF K. These documents are due by 11 September 2025, prior to the commencement of stage 3 operations. On receipt of these documents, the department will evaluate the effectiveness of the proposed measures and will incorporate suitable conditions into the licence, if necessary. It is expected that seepage issues will be addressed through the implementation of a comprehensive groundwater management plan. A further licence amendment is expected to be submitted by the licence holder in the near future and the department anticipates that this review will be incorporated into the amendment process.

The Delegated Officer has determined that the construction of TSF K stage 3 and stage 4 raises will be granted in accordance with this amendment application. However, at this point in time, only operation at stage 3 embankment height will be approved (condition 1.3.5). It is noted that the operation of TSF K at the stage 4 embankment height is not due to commence until the latter half of 2027 – approximately two years from the time of writing this report. Restricting operation to stage 3 height will require the licence holder to apply for another licence amendment in 2027 to seek approval to continue tailings deposition at the stage 4 height.

A staged assessment of operations at the increased embankment height will enable the department to re-assess seepage management at TSF K and determine whether seepage continues to be appropriately managed. The decision was made taking into consideration the historical performance and management of TSF K and is intended to ensure that any impact on

receptors is effectively controlled and mitigated.

Taking into account the above, the likelihood of this risk event has reduced from *'likely'* to *'possible'* making the risk rating *medium*.

4. Consultation

Table 6 provides a summary of the consultation undertaken by the department.

Table 6: Consultation

Consultation method	Comments received	Department response
Comments and technical advice on the proposed activities were sought from the DEMIRS on 17 March 2025.	DEMIRS responded on 11 June 2025. By this time mining proposal 500132, incorporating the proposed activities in this amendment report had been approved. DEMIRS had no further comments.	N/A
A copy of the draft licence and draft amendment report was provided to the licence holder on 02 July 2025.	Licence holder comments are shown on Appendix 1.	The department response to the comments is shown on Appendix 1.

5. Conclusion

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

5.1 Summary of amendments

Table 7 provides a summary of the proposed amendments and will act as a record of implemented changes. All proposed changes have been incorporated into the Revised licence as part of the amendment process.

Table 7: Summary of licence amendments

Condition no. or section before the amendment	Condition no. or section after the amendment (if applicable)	Proposed amendments
Throughout the licence	N/A	Conditions and Tables have been renumbered to ensure consistency and a chronological order The word '*shall'* has been replaced by '*must'* in accordance with current standards.
Cover page, DWER File number	N/A	Updated to the current Environment Online file number.
Cover page, Date of amendment	N/A	Updated as per this amendment report date.

Condition no. or section before the amendment	Condition no. or section after the amendment (if applicable)	Proposed amendments
Contents	N/A	Updated for consistency.
Introduction – Premises description and Licence summary	N/A	Water licence number amended to the most current version, GWL 159247(5) In accordance with this amendment, removed the description of the Golden Age pit, as no longer current.
Introduction – Instrument log	N/A	Added the details of this amendment including: licence number, issue date and a brief summary of its content.
1.2	1.3	Condition has been moved and renumbered as appropriate.
-	1.2	Subsection title: *Construction requirements – Infrastructure and equipment* added for clarity.
1.2.8	1.2.1	Condition moved Added the following items of infrastructure, in accordance with this amendment: • TSF K Stage 3, and Stage 4 raises and associated decant water recovery systems • Golden Age in-pit TSF and the associated exploration holes The items of infrastructure include their design and construction requirements and the location at the premises.
1.2.3	1.3.3	Amended table column description to *Description and operational requirements* for clarity Removed containment point reference C2GA row as no longer current Added the Golden Age pit to the table with its description and operational requirements Amended TSF K material and description columns to reflect this amendment report. Reworded description for clarity.
-	1.3.5	Added condition to clarify the construction and operating heights of TSF K in accordance with this amendment report.
-	1.3.6	Added condition to manage the risks to receptors associated with the toll treatment of external ores.
3.3.1	3.3.1	Table 3.3.1 – Added the following parameters to monitoring point PM3 (pond): • TDS (mg/L) - monthly frequency • Weak acid dissociable cyanide (mg/L) – quarterly frequency in accordance with the risk assessment table (Table 3 of this amendment report)
3.4.1	3.4.1	Table 3.4.3 - Redistributed parameters for clarity Added additional IPT6 bore to the *In pit tailings facilities bores* monitoring points in accordance with this amendment Added a limit on the Weak acid dissociable cyanide parameter as

Condition no. or section before the amendment	Condition no. or section after the amendment (if applicable)	Proposed amendments
		discussed on the Risk assessment table (Table 3) Removed the Golden Age Pit from the list of *Tailings and decant water storage pits* in accordance with this amendment.
5.2.1	5.2.1	Table 5.2.1 - Added the reporting requirement of condition 1.3.6 as discussed on the risk assessment table (table 3 of this amendment report).
Figure 5	N/A	Replaced with most current figure.
Schedule 3	Schedule 5	Moved.
-	Schedule 3	Added TSF K lift construction requirements, to include figures 9-12.
-	Schedule 4	Added Goden Age in-pit TSF requirements, to include figures 13 – 16.

References

1. CMW Geoscience, 2024, *Talings Storage Facility Cell K (TSF K) Stage 3 and Stage 4 Raises: Desing Report,* Perth, Western Australia.
2. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
3. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
4. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
5. SRL 2024, *GAC In-Pit Tailings Storage Facility Design Report: Wiluna Gold Mine,* Melbourne, Victoria.
6. Wiluna Operations Pty Ltd, 2024, *Annual Environmental Report: Licence L5206/1987/10 1st January 2024 – 31 December 2024,* Perth Western Australia.

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

Condition	Summary of licence holder's comment	Department's response
1.2.4, 3.4.1, 3.4.2	To remain consistent with the premises nomenclature the new groundwater bore at the Golden Age in-pit TSF will be referred to as IPT6 instead of GAMB1.	The monitoring bore reference has been amended on the licence.
1.2.4, 1.2.5	Groundwater bore GAMB1 (now IPT6) was constructed at the time groundwater bore TD8-B was replaced (see below). A completion report has now been submitted (Rockwater, 2025). This document outlines the bore construction specifications, location (including GPS coordinated) and the bore logs. Construction requirements on the licence are therefore redundant.	The department has assessed the construction completion report and has found that the construction of IPT6 is acceptable. Conditions 1.2.4 and 1.2.5 on licence have been removed as they are redundant. The Delegated Officer notes that it is the licence holder responsibility to ensure compliance with section 26D (licence to construct or alter a bore) of the RIWI Act.
3.4.1	Groundwater bore TD8 located to the south of the process pond and adjacent processing plant was accidentally destroyed by earthmoving equipment in December 2024. This groundwater bore has now been replaced. Its reference has change from TD8 to TD8-B. Groundwater bore TD8-B construction specifications, location and bore log are included in the completion report submitted.	The construction completion report shows that the construction of TD8-B is acceptable. The monitoring bore reference has been amended on the licence.
3.3.1 (Table 3.3.1)	The department has requested weekly monitoring of TDS in mg/L at PM3. Weekly monitoring of this parameter appears to be excessive and should be reduced to monthly monitoring as it is expected that salinity will not substantially fluctuate between readings. Should salinity concentration remain relatively constant over time further discussions will be held with the department to reduce the monitoring to quarterly readings.	The Delegated Officer has reviewed the monitoring requirement and has deemed that monthly monitoring will be sufficient for the purpose of determining the process pond salinity (PM3) and the risk to the surrounding avifauna.